JANUARY, MDCCCXLIII.

THE ZOOLOGIST:

AN

ILLUSTRATED MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS & ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, ANNELIDES,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

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That the Primates are central in a group known as Placentals.

In the second part the author will attempt to show

That the Placentals are central among Vertebrates.

The Vertebrates are central among Animals.

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[*See Page* 3.]

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CONTENTS OF 'THE ZOOLOGIST' FOR JANUARY.

QUADRUPEDS.

BIRDS.

ANNELIDES.

INSECTS.

ZOOPHYTES.

No. 2 will be published on the 1st of February. Contributions are earnestly solicited, and must be addressed to the Editor, at the Publisher's, 1, Paternoster Row.

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THE

ZOOLOGIST:

A

POPULAR MISCELLANY

OF

NATURAL HISTORY.

CONDUCTED BY

EDWARD NEWMAN, F.L.S., Z.S., &c.

VOLUME THE FIRST,

ILLUSTRATED BY UPWARDS OF ONE HUNDRED FIGURES.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.XLIII.

Nature never did betray
The heart that loved her! 'Tis her privilege,
Through all the years of this our life, to lead
From joy to joy, for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Nor greetings where no kindness is, nor all
The dreary intercourse of common life,
Shall e'er prevail against us, or disturb
Our cheerful faith that all that we behold
Is full of blessings.—WORDSWORTH.

PREFACE.

THE attempt to combine scientific truths with readable English, has been considered by my friends as one of surpassing rashness; and many have been the kind and pressing solicitations I have received to desist from a labour so hopeless, — many the supplications to introduce a few Latin descriptions, just to give the work a scientific character.

In reply to my friends, I would beg to instance White's Selborne. That most delightful of histories is written in pure, plain, intelligible English, and has found ample favour in the eyes of the public. White is now no more, but his mantle has fallen upon others: — a multitude of observers have arisen in the same field, and, what is more to my purpose, have become contributors to the pages of 'The Zoologist.' Nature herself is exhaustless: our field of observation is wider, a thousand-fold, than White ever enjoyed; our capacity for observation is certainly not less. These are the grounds I have for hoping that 'The Zoologist' will succeed.

I beg to offer my warmest thanks to those naturalists who have by their contributions rendered me such important assistance. I would gladly mention by name several whose papers have struck me as particularly pleasing; but in doing so I feel I should be guilty of an unkindness towards others, whose contributions are equally well intended, and equally essential to keep up the character of the work, as a general register for zoological facts.

I hope every contributor to this volume will be also a contributor to the next: and I hope too that each present contributor will

induce some friend to become so. I wish that every district should have a chronicler of its Natural History, and that 'The Zoologist' should be the receptacle for all.

My part in connexion with 'The Zoologist' is widely different from that of editors in general. I am no intellectual giant, through the ordeal of whose searching criticism each contribution must pass before its publication. Every one who subscribes a single fact is welcome — nay, more than that — has a direct claim to be admitted as a contributor. My only duties are, *first*, to give the facts something like arrangement, — to associate, as much as possible, those which relate to one group or one class of animals, and to print every communication relating to that group before I proceed to another; and, *secondly*, to defray the charges incidental to publication: and, since every item of expenditure is conducted with a view to strict economy, the proceeds from a very moderate sale would be sufficient to reimburse me.

In conclusion, let me advert to the difficulty there is in making the existence of 'The Zoologist' known even to those who feel the warmest interest in the subjects of which it treats — the difficulty of attaining even a moderate circulation: — and let me entreat those who become acquainted with the work, to make it known amongst their friends.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
November 11, 1843.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

ALPHABETICAL LIST OF SUBJECTS.

ALPHABETICAL LIST OF ILLUSTRATIONS.

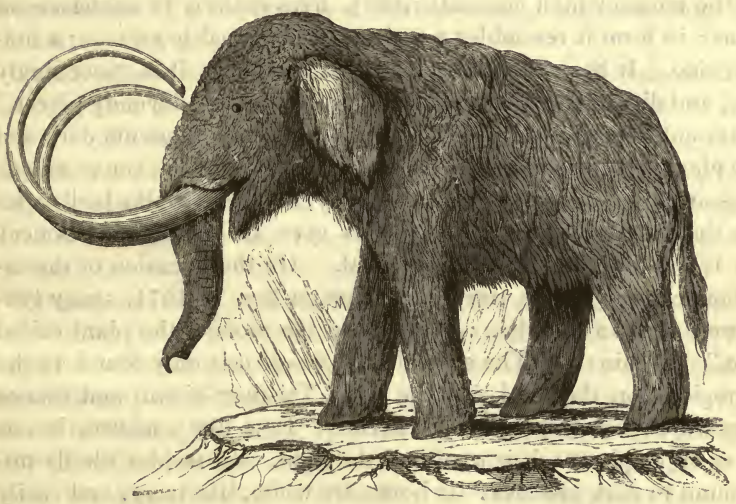
ADVERTISEMENT.

Should 'The Zoologist' meet with encouragement, it will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with illustrations engraved in wood; will be on sale three days before the end of every month; and will be charged one shilling. As an annual, it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list of contents will be published once in the year: this will be arranged in three divisions, the first to comprise the names of contributors, with the titles of their contributions; the second of subjects; and the third of illustrations: for this list no charge will be made. In order to avoid confusion, it is intended to page the work continuously from its commencement to its completion, and the binder is directed to place on the back of each volume, the pages it contains.

THE ZOOLOGIST.

No. I. | JANUARY, MDCCCXLIII. | Price 1s.

Note on the Siberian Mammoth. Principally extracted from Cuvier's 'Recherches sur les Ossemens Fossiles,' 4to. i. 141, &c.



"Triomphante des eaux, du trépas et du temps,
La terre a cru revoir ses premiers habitans."

Delille.

It may be asserted, on the universal testimony of travellers and naturalists, that the whole of Asiatic Russia abounds in the remains of these huge animals. Their bones and tusks are of so common occurrence, that the Siberians, in order to explain such a phenomenon, have invented a tale that they belonged to animals which lived underground in the manner of moles, and could not bear the light of day. To these they gave the name of *Mammont* or *Mammouth*, as some assert from the word *mamma*, which, in one of the Tatar dialects,

signifies the *earth;* others derive the name from the Arabic word *Behemoth*, employed in the book of Job for some large or unknown animal, or from *Mehemoth*, an Arab term applied to elephants when of extraordinary size. By the name of *mammoth-horns* the Siberians designate the fossil tusks which are so numerous and in such excellent preservation throughout the northern districts, that they are employed for exactly the same purposes as recent ivory, and form an important branch of commerce, which the czars have endeavoured exclusively to monopolize.

The fable of a subterranean animal is known to the Chinese, who call the tusks of the mammoth the teeth of *tien-schu*, under which word we find in the great work on Natural History, the following account. "The animal called *tien-schu*, *tyn-schu*, or *yn-schu* (signifying the mouse which conceals itself), lives entirely in subterranean caverns; in form it resembles a mouse, but is equal to an ox or a buffalo in size. It has no tail, and is of a dark colour; it is exceedingly strong, and digs caverns in which it lives, in rocky and woody places." Another author writes thus:—"The tyn-schu only frequents dark and lonely places: it dies instantly on seeing the rays of the sun or moon: its legs are short in proportion to its body, so that it walks badly: its tail is the length of a Chinese ell: its eyes are small and its neck bent: it is a stupid and slothful animal. On the occasion of the inundation caused by the river Tan-schuann-tuy, in 1571, many tyn-schu were seen in the plain: they fed on the roots of the plant called *fu-kia*." Again:—"The animal call *fin-schu* is only found in the cold regions on the banks of the river Tai-tunn-giann, and thence northward as far as the northern ocean. It is like a mouse, but as large as an elephant: it is afraid of the light, and resides wholly underground in dark grottoes: its bones are white, like ivory, and easily worked, and are without cracks: its flesh is cold, and very wholesome."*

It is doubtless owing to the great profit arising from the sale of the tusks of mammoths that the Russians and Siberians have been induced to search for them so diligently, and thus found such vast numbers of bones throughout that extensive country: to this it may be added, that the immense rivers which flow into the Frozen Ocean become prodigiously swollen annually, when the thaw commences, break up

* These details are extracted from a note communicated to the Academy of St. Petersburgh by M. Klaproth, and were printed by Tilesius in the Memoires of that Academy, tom. v. p. 409.

and carry away large portions of their banks, and expose the bones previously buried in the earth; again, many others are found in excavating for wells and the foundations of buildings. There is no ground for adopting the hypothesis of Patrin, that these bones are brought by the rivers from the mountains of India, where elephants exist in a state of nature at the present day. Moreover, the bones are no less abundant on the banks of the Volga, Don and Jaïk, which run from the north; and of the Lena, Indigirska, Kolima and Anadir (which flow from the very cold mountains of Chinese Tartary, where assuredly no elephants exist), than in the Ob or the Jenissea, and its tributary streams; of which the Irtisch is the only one that approaches sufficiently near to the mountains of Thibet, to allow the application of the hypothesis with any show of probability. They also exist in the peninsula of Kamschatka, which they could not reach from India without making an extraordinary circuit.

Pallas tells us that there is no river or stream in all Asiatic Russia, from the Don to the promontory of Tchutchis, on the banks or in the bed of which the bones of elephants, and other animals foreign to the climate, are not to be found; and this, he observes, is more particularly the case with the rivers of the plains. These bones are found in all latitudes, but the best ivory comes from the north, on account of its being less exposed to the action of the elements.

In answer to the hypothesis that these bones could result from human expeditions (such, for instance, as that under Annibal, by which many elephants were brought into Italy and never returned), their immense numbers may be adduced as quite conclusive. Moreover, in many places in France, Germany, Italy and elsewhere, the bones are invariably intermixed with those of other wild beasts of all sizes. The bones are generally dispersed, and in but very few places have entire skeletons been found, preserved as it were in sepulchres of sand. Pallas seems to have overlooked one important fact, *namely*, that in certain places skeletons of mammoths have been found, with portions of the flesh and other soft parts still attached to them. It is the universal opinion throughout Siberia, that mammoths have been found with the flesh quite fresh and filled with blood; this, although an exaggeration, is founded on the fact that entire bodies have been discovered, preserved in ice, with the flesh comparatively in a state of freshness. Isbrand Ides speaks of a head, on which the flesh was decaying, and of a frozen leg, as large as the body of a man: and Jean Bernhard Muller mentions a tusk, the cavity of which was filled with a substance resembling coagulated blood.

These extraordinary accounts might be considered doubtful, had they not been abundantly confirmed by others, of which the authenticity is fully established. The first of these is the disinterment of a rhinoceros in 1771, near Vilhoui, having its flesh, skin and hair as in a living state. A circumstantial account of this event is recorded by Pallas; and the head and legs of the animal are still preserved at St. Petersburgh. The second was the discovery of a mammoth on the banks of the Alaseia, a river which flows into the Frozen Ocean beyond the Indigirska. The account is given in the voyage of Sarytschew. It had been dislodged by a flood, and the carcass was almost entire, and was covered with a skin, to which, in some places, long hair was still attached. The third was that of the mammoth brought to St. Petersburgh by Mr. Adams, and found in a state of preservation perfectly marvellous. The fact was first recorded in October, 1807, in the 30th number of the 'Journal du Nord,' published at St. Petersburgh, which, after being copied into various periodicals, was republished, nearly as follows, in the fifth volume of the Memoirs of the Academy of St. Petersburgh.

In 1799 a Tungusian fisherman observed, in a bank on the shore of the Frozen Ocean, at the mouth of the river Lena, a shapeless mass, almost enveloped in ice, and he was quite unable to make out what it could be. The year following, a larger portion of this mass became visible, but the fisherman was still unable to ascertain its nature.—Towards the end of the following summer one of the tusks and an entire side of the animal were exposed. It was not, however, until the fifth year from its discovery, when the ice having melted sooner than usual, that the enormous animal became entirely detached from the bank or cliff in which it was first observed, and came thundering down on to a sand-bank below. In the month of March, 1804, the fisherman extracted the tusks, which were 9 feet 6 inches long, and together weighed 360 lbs., and sold them at Jakutsk for fifty rubles. Two years afterwards Mr. Adams visited the animal, and found it much mutilated. The Jakoutes residing in the neighbourhood had cut away the flesh to feed their dogs; wild beasts, especially white bears, foxes, &c., had also eaten a great quantity of it. Nevertheless, the skeleton was entire, with the exception of a fore leg; the other bones being still held together by ligaments and portions of skin. The head was covered with dried skin; one of the ears was entire, and furnished with a tuft of hairs: the pupil of the eye was still to be distinguished; the brain was in the skull, but somewhat dried; the lower lip had been gnawed by animals, the upper one was entirely gone,

and the teeth consequently exposed: the neck was furnished with a long mane; the skin was covered with long hair and a reddish wool; the portion of skin still remaining was so heavy, that ten men could scarcely carry it: according to Mr. Adams, more than thirty pounds weight of hair and wool was collected from the wet sand into which it had been trodden by the white bears while devouring the flesh.—Mr. Adams took the greatest pains in collecting what remained of this unique specimen of an ancient creation, and procured the tusks from Jakutsk. The Emperor of Russia purchased the skeleton, which is now in the Museum of the Academy of St. Petersburgh. The height of the creature is about 9 feet, and its extreme length to the tip of the tail about 16 feet. Portions of the skin and hair were presented to most of the continental museums, as well as to the College of Surgeons in London.

The figure at the head of this article is confessedly ideal, but combines the characters which the observations of naturalists seem to have ascertained as being possessed by this extraordinary relic of an antediluvian world. We are accustomed to the shells and even bones of animals that lived in long-past ages; we find them converted into stone, and becoming part and parcel of the earth on which we tread; but here we have an animal, preserved in pristine freshness, handed down to us by the intervention of frost, from a period too remote to contemplate, and yet in that perfect state of preservation which ice and amber have alone achieved. The mammoth seems a link connecting the past and the present worlds—a being whose body has outlived its destination. All the arguments which have been used to prove that the earth has undergone some great convulsion since this huge animal was endowed with life, appear perfectly untenable. In the first place, it is evident that its life became a sacrifice to a sudden snow-storm, by which it was overtaken, overwhelmed and suffocated. The suddenness of the storm might have been accidental; the winter might have set in earlier, it might have been more severe than usual: but the animal was well adapted for such winters; its long, warm and shaggy coat proclaim it a denizen of Arctic countries, and is admirably adapted to exclude the severest cold: such a clothing would have been intolerable in tropical regions, where elephants now abound. We learn from Bishop Heber, that in some of the mountainous and colder districts of northern India, hairy elephants still exist, thus showing that this clothing is provided as an especial protection against the climate; and at the same time leading to the obvious conclusion, that the well-clad mammoth, like the polar bear

was the destined denizen of still severer climes. Nature ever adapts her creatures to the circumstances under which she has chosen to place them.

Cuvier has recorded his opinion that the mammoth was specifically distinct from either of the existing elephants, and has named it *Elephus primigenius.* The principal differences which he points out are these: the tusks are longer, more curved, and towards the extremity have an inclination outwards; the alveoli in which they are placed are larger and more produced; the neck is shorter, the bones altogether stronger, and the body thickly covered with hair. In a drawing, professedly made on the spot and sent to St. Petersburgh, the animal was represented without a trunk, with pointed erect ears, and a bristly upright mane; but the inferences drawn from the parts now remaining militate against the correctness of this drawing, and must be received in preference to a production which, from the mutilated state of the carcass, must necessarily have been indebted to the imagination of the draughtsman for some of its details. K.

Short Communications on Quadrupeds.

Note on the occurrence of Bats at Epping. The Barbastelle bat (*Plecotus Barbastellus*), I am inclined to believe, is not uncommon in the Forest. I have had five specimens brought to me at various times, all taken on the edge of the Forest; and have frequently seen bats, which I believe to be this species, flying in the shady parts of the Forest at dusk, but it is by no means easy to obtain them, from the difficulty of finding them when shot. The other species which I have found here are the great bat (*Vespertilio noctula*), the common bat (*V. pipistrellus*), the whiskered bat (*V. mystacinus*), Natterer's bat (*V. Nattereri*), and the long-eared bat (*Plecotus auritus*). I saw V. Nattereri flying about the lanes at Sawtry, in Huntingdonshire, in June last.—*H. Doubleday; Epping, December* 6, 1841.

Notice of a Bat flying by daylight. One sunny day in August, four or five years since, I was on Wimbledon Common, when my attention was directed upwards by the screaming of swallows, and the cause of their disquiet then became apparent. A large bat was sailing about most majestically, attacked on all sides by the swallows, who seemed ill to relish the intrusion of this lover of twilight into day and their society. As the sun was shining brightly, I was surprised to see the bat on the wing; but I was much more interested by ob-

serving the comparative powers of flight of the two animals. Quick as were the evolutions of the swallows, they were clumsy compared with those of the bat. The more it was pestered by its numerous opponents, the more gracefully did it twist, and turn, and try to escape, which it was evidently desirous of doing, and this its superior power of wing soon enabled it to accomplish, leaving its pursuers far behind —*J. W. Douglas;* 4, *Waterloo Place, Cobourg Road, June* 16, 1842.

Anecdote of a Mole. In the spring of 1839 I was by the side of a large piece of water, and saw the earth heaving up, evidently the effect of the working of a mole; and having read a good deal about moles taking the water, I thought I would try if this one could swim. I therefore put down a stick into the earth, on one side of the mole, and elevating it suddenly with a jerk, threw the animal into the water twelve or fourteen feet. It immediately swam in a straight line towards the edge, using its feet with great rapidity, and proceeded about four feet, when it turned and described a circle, and continued to do so for some time, the circumference becoming less every revolution, until the mole became quite exhausted, remained stationary, and soon ceased to exist. Meanwhile my endeavours to reach it, and if possible save it from its impending fate, were vain; I could not get it in time to save its life, and regretted that I had sacrificed it to my curiosity; its manner in the water, however, satisfied me that a mole can swim, but it probably would not do so voluntarily.—*Id.*

Notice of a 'History of British Quadrupeds, including the Cetacea.' By Thomas Bell. London: Van Voorst.

"Floriferis ut apes in saltibus omnia libant
Sic nos."— Lucretius.

The geographical distribution of vertebrated animals is one of the most interesting branches of Natural History. The causes by which the increase or decrease—the introduction or extermination of a species is governed, are often obvious or easily ascertained; at other times they are lost in the obscurity of past ages or dimmed by the intervention of fiction. Most of those changes of which we can obtain positive evidence are due to the intervention of man: while others—those remote changes of which the geologist tells us, recorded only by evidences exhumed from the bowels of the earth, seem to have taken place long before the commencement of man's irresistible influence. The changes of which the record is within our reach, would appear

almost miraculous were they not so familiar. The dog, doubtless the original denizen of European and Asiatic forests, has lost all trace of his original freedom, and appeals to man for his daily bread in exchange for his services and faithful companionship. His size, his figure, his clothing, his very senses are so altered and so varied, that it has become a matter of scientific enquiry to ascertain his original condition. In Australia, where it is said he was once unknown, he has shaken off his allegiance to man, and is distinguished by habits of rapine and savage freedom, though with an inferiority of size and figure. Again, in America, where but lately he made his first appearance as a slave and a stranger, the noble horse now ranges over boundless plains in a state of the most controlless liberty, while in the temperate regions of the old world, whence he came, he is scarcely known but as a slave and a captive. In the days of Plutarch bears were exported from Britain for the amusement of the Romans; at the present day Britons import them for a similar purpose. In the reign of Edward the First wolves were sufficiently numerous to justify the appointment of a royal commission for their destruction; and at a somewhat more remote date houses were erected by the way-side as places of refuge against their attack. The pig, now only known here as the tenant of the sty, once ranged our woods at large under the special protection of royalty, too noble a game to be slaughtered by any other than regal hands; and the poor commoner who dared to transgress, paid by the loss of his sight for so gross an infringement on the prerogative of monarchs. In North America the buffalo and native Indian are retreating daily before the face of the white man; and the time seems fast approaching when the existence of both will be a matter of history. Birds are less subject to these changes; their powers of coming and going are less limited; and few that have once inhabited a country have ever been known entirely to abandon it. Of these few the common stork is a striking example. It was formerly abundant here, and is now equally so in the towns of Holland, under the same latitude and climate, and equally densely peopled with our own country. The capercailzie, formerly an inhabitant of Scotland, and still abundant in the pine forests of Norway, has once become entirely extinct in the former country; yet on being again introduced has readily taken to its former haunts, and bids fair once more to be reckoned among our *feræ naturâ*.

Now in enumerating the animal productions of a country, it is necessary maturely to consider the claim of each to be admitted into the list. In Great Britain, geologists have discovered abundant traces

of a great number of animals, the living representatives of which are now confined to the intertropical regions: in company with these we also find the vestiges of tropical vegetables. A moment's reflection will therefore be sufficient to convince us that these productions have nothing in common with our temperate and humid island, and we cannot associate together animals so distinct without a violation of truth. That the remains of such animals exist in the earth beneath our feet, is most unquestionable; but that they were ever the denizens of a cold, humid and sea-girt spot in the ocean, like that which now serves as a sepulchre for their bones, there is no evidence whatever to support. Such animals could not be introduced into our list, even of extinct British animals, without utterly violating all known principles of geographical distribution. If on this question hypotheses must be built, let us resort to the more probable one that the ground on which we tread was once a portion of some vast continent, scorched by a vertical sun, rather than by supposing these creatures ever to have been the inhabitants of an island, such as Great Britain at the present day, thus unnaturally associate them with others fitted by nature for a present residence amongst us.

The second question arises on the propriety of retaining among the productions of a country those of which history or tradition furnishes evidence more or less satisfactory. There is now a spirit of investigation on foot which makes sad havoc with the belief to which our fathers would have cheerfully assented. Naturalists now doubt the very existence of the Dodo, while a few years back, aye, within our memory, three distinct species were enumerated, the colour, figure and size carefully laid down, their nest and eggs described with minute and scrupulous accuracy, and their entire history detailed as fully as that of the barn-door fowl; all this was copied into the 'Encyclopedia Britannica,' a book then regarded as second only to the Scriptures in value and authority. It is therefore far safer to leave to history those animals which, abandoning their ancient haunts, have fairly entered into its province.

The third question touches the dog, the ox, the sheep, the goat, the horse, the ass, the turkey, the peacock, the pintado, the goose, the duck, and those numerous other useful animals that have accompanied man in all his enterprises, and settled around him whether he has pitched his tent in the city or the desert: these also must be rejected, because they exist not in a state of nature; they are preserved by man's especial care, and without that care they must inevitably perish, even by the hands of man himself. Could we suppose a manumission of all the domesticated animals to take place by an act of

the legislature, and ownership in each to cease on a given day, they would not maintain even a temporary footing in the land where they are now cherished and pampered to supply the wants and luxuries of man. Every one would shortly be exterminated by that very being from whom they had received a nominal freedom: the ox and the sheep, although lost to him at whose expense they were reared, would still be converted into beef and mutton; and worse than this, the races would become extinct, from the restless activity with which they would be pursued.

Lastly come those animals which, though now naturalized, are said to have been introduced from other countries, as the rat in Britain, the dog in Australia, the horse in South America: it is impossible to point out other countries in which these animals exist more completely without the intentional assistance of man, or more in direct opposition to his will. They are so firmly established in their respective holds that their extermination is almost beyond the reach of hypothesis: such animals as these are strictly naturalized and strictly native; the date and manner of their original introduction is already dimmed by the mist of time, and is becoming more and more obscure. When an animal is once established, we commonly begin to discuss its origin. It is thus already with the Australian dog. By some authors it is said to be indigenous, by others, introduced: ranged on both sides of the question are to be found naturalists of eminence, who speak with the greatest confidence, adopting their own individual opinions as indisputable facts in Natural History. In the same country horses, escaped from the bush rangers, have already assumed a state of freedom: horned cattle must shortly become wild, deer will follow these, and in a few centuries some Australian naturalist will write thus.—"It will scarcely be credited by the well-informed Australian of the present day, that our forefathers, impressed by the importance of the British people, from whom we are doubtless descended, attribute also to that hardy and enterprising race the introduction of our magnificently antlered stag, our noble horse, now, alas, almost exterminated by our densely crowded population! our countless herds and flocks, now so tractable, once free as the holy air we breathe, yea, even of the very herbage on which they browze and of the oaks under which they shelter from the noon-tide sun: in fact, they represent Australia as the country of kangaroos and Eucalypti. More than one author of reputation has asserted that our Fauna was limited to those half-quadruped half-reptile creatures now happily scarcely known except in our museums, to which they assigned the outlandish name of

marsupials. How truly it may be said that ignorance is the parent of prejudice, and conceit the chief organ of organized and accredited falsehood!" Who shall then say to the Australian that he is himself the victim of the ignorance and conceit which he so justly deplores? Our books will avail us nothing; he will detect this ignorance and conceit in every page: he will credit our statements as little as we believe in the histories of blue lions, fiery dragons, or demure dodos. It is therefore the best way to treat an introduced animal, if perfectly independent of man, exactly as we treat acknowledged natives. The question is merely one of comparison; each living inhabitant of a country has undergone the process of introduction, though the date of that introduction be entirely lost sight of in the obscurity of ages. From the moment an animal or plant naturalizes itself, maintains its position and perpetuates its kind without the assistance of man, or in open defiance of his power,—from that moment it is equally a native with those which hold the best title to be considered aborigines; and all that we can say by way of distinguishing these from the rest is to append to their names the supposed date of introduction.

The geographical distribution of animals has obtained the consideration of our ablest naturalists, and almost all of them have thought it necessary to invent such hypotheses as shall account for recorded or observable phenomena; this however seems scarcely the legitimate aim of the naturalist: and indeed it is remarkable how very much less satisfactory are the learned explications of the most able hypotheses than the plain record of the most simple facts. In taking therefore a slight view of the vertebrated inhabitants of Britain, no notice will be taken but of species existing in a state of perfect freedom; and the enumeration will be made strictly in accordance with the views already explained. K.

(To be continued).

Short Communications about Birds.

Tree Sparrow, (Pyrgita montana). I noticed this bird in great plenty in June 1841, in the neighbourhood of Aldwinkle, in Northamptonshire. They were commonly in pairs, in the foot-paths of the fields, apparently collecting food for their young. I found several nests in the heads of old willows.—*Henry Doubleday; Epping, June* 16, 1842.

Arrival of the Summer Birds of Passage at Epping, from the year 1831 to 1842.

	1831.	1832.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.
European Goatsucker	May 8	May 4	May 10	May 8	May 15	May 19	May 10	May 19	May 27	May 8	May 2	May 1
Swift	1	5	2	29	9	13	2	6	4	4	4	1
House Martin	April 9	April 16	April 24	25	April 19	April 24	April 30	April 22	April 21	April 23	April 27	April 24
Sand Martin	Mar. 27	Mar. 29	Mar. 28	8	18	19	27	14	1	23	4	20
Swallow	April 5	April 8	April 11	7	8	13	22	14	16	12	16	19
Grasshopper Warbler	——	May 1	——	22	——	May 3	——	——	21	May 1	25	23
Sedge Warbler	April 21	April 16	April 15	16	19	4	May 2	19	27	April 23	25	20
Wood Wren	23	24	26	21	May 2	9	5	May 4	May 2	25	27	24
Willow Wren	5	4	1	7	April 3	April 10	April 20	April 10	April 10	10	5	12
Lesser Pettychaps	Mar. 27	2	2	Mar. 11	1	Mar. 19	4	Mar. 29	Mar. 27	4	25	Mar. 16
Lesser Whitethroat	April 16	18	20	April 18	29	April 21	27	April 22	April 25	23	23	April 22
Common Whitethroat	12	21	23	19	15	18	27	23	18	17	19	23
Greater Pettychaps	May 1	29	May 2	30	May 10	May 12	May 7	22	22	May 1	27	22
Blackcap	Mar. 29	14	April 1	1	April 9	April 15	April 12	12	15	April 10	25	Mar. 29
Nightingale	April 9	15	20	19	21	17	25	23	19	17	12	April 22
Redstart	5	12	2	7	7	12	20	11	16	10	4	8
Whinchat	22	22	23	19	16	18	28	25	22	17	20	6
Wheatear	Mar. 30	Mar. 29	5	Mar. 28	1	Mar. 16	2	5	——	17	——	4
Tree Pipit	April 10	April 18	11	April 11	9	April 18	21	11	12	16	16	21
Yellow Wagtail	14	19	22	19	9	10	19	13	20	18	25	15
Spotted Flycatcher	May 4	30	May 1	May 2	May 15	May 9	May 4	May 6	May 4	May 7	May 1	May 1
Red-backed Shrike	April 30	May 8	3	2	9	9	2	4	2	April 25	24	April 24
Wryneck	5	April 4	April 5	April 6	April 1	April 13	April 20	April 19	April 16	10	April 2	Mar. 25
Turtle Dove	May 1	May 1	May 2	30	May 12	23	May 7	20	20	May 4	25	April 26
Cuckoo	April 21	April 20	April 21	15	April 21	14	April 26	23	20	April 20	13	20

In the above table the line —— indicates that the arrival of the bird against which it is placed was not observed.—*Id.*

Ornithological Notices. The ring-ousel (*Merula torquata*), the pied flycatcher (*Muscicapa atricapilla*), and the hobby (*Falco subbuteo*), occasionally visit us in the spring, but their appearance is very uncertain. In the spring of 1840 several ring ousels remained a few days in the neighbourhood. A single reed-warbler was shot at a pond close by the town, in 1835, which is the only individual I have seen here. In the spring of 1841 the redstart, nightingale, willow-wren, lesser pettychaps and garden warbler, were very numerous; while the blackcap, whinchat, lesser whitethroat, red-backed shrike and spotted flycatcher were far less common than usual.—*Id.*

Appearance of Migratory Birds near Sheffield. The absurd notions entertained by some of the naturalists of the last century, with respect to "birds creeping down reeds &c." have been exploded long ago by the scientific world; but still, even now you do find some of the country people talking of a change of plumage towards winter: such as Crex pratensis being shot in a different dress, and which, from description, must be Rallus aquaticus. I have offered these people large rewards to bring me a "corn creak," but of course never could get one at that season. The following observations, given under the hope that they may possibly be useful, have been made on the spot that twenty-one years ago gave me life; where, undisturbed, many of the summer birds delight us with their lovely forms and rich vocal powers.

The earliest arrival (excepting the wheatear, whose migrations are on a small scale) is the lesser pettychaps (*Phyllopneuste rufa*): on the 1st of April, 1838, I obtained a specimen; this was very early, for in 1841 they appeared on the 24th of April; in 1842 the time of arrival was April 22nd, on the 25th they were quite abundant. Redstarts (*Ruticilla Phœnicura*) arrived April 7th, 1841; they did not make their appearance until April 24th this year. In this locality the 24th of April is the average time of arrival with the blackcap warbler (*Curruca atricapilla*), garden warbler (*C. hortensis*), greater and lesser whitethroat (*S. cinerea* and *curruca*), the wood and willow wrens (*Phyllopneuste sibilatrix* and *Trochilus*). Cuckoos, reed and grasshopper warblers are not abundant in our immediate vicinity, so that I am not able to give dates to a day, but the cuckoo is generally on our moors in the latter part of April, and sedge-birds arrive about the same time. Nightingales are quite rare with us; there are a few about Conisborough Castle and Doncaster, but I cannot give the time of their arrival. On the 28th of April I saw the swallow (*Hirundo rustica*). The swallows are sadly persecuted by strolling gunners from the town.

Two pairs of swifts are breeding in St. Philip's church; they arrived the beginning of May. When out late at night entomologising, I often see the swifts going back to their nests, which are several miles off. The common fly-catcher (*Butalis grisola*) was seen May the 7th, 1841, and on the 8th of May, 1842. My notes of departure in 1841, were — the last chiff-chaffs and warblers were seen September 17th; all the flycatchers left between the 15th and 18th of September; there were a few swallows and martins near the source of the Derwent. On the morning of September 29, there was a complete equinoctial gale; at noon many swallows were flying about, but all hurried southward in the evening.

A friend of mine, well acquainted with birds, told me he saw a single swallow going south on October 9th. It is most probable that nearly all our summer birds go to winter in the north of Africa, some remaining in the south of Spain, for wings of the warblers have been brought from the latter country in the winter, by persons that were not able to skin. On the American continent we find that from an equal range of districts there is a similar flocking to the equator.— Many of the migratory birds visit the same locality year after year: a pair of flycatchers (*Butalis grisola*) built their nest for eight or ten summers on a leaden water-conductor at the top of our house; another pair fix their nest every year on the branches of our wall-fruit trees, and notwithstanding the cats often destroy it, they still persevere. A pair of redstarts in the same manner build in a wall by us. It is well known that martins return to the same nest; ofter over a country inn door, where it is almost impossible to drive them away, I have seen blocks of wood nailed on the spouts as the only alternative. The return of the same individuals is given by my friend Mr. Audubon in his 'Biography of the Birds of America,' ii. 122, in the article Muscicapa fusca: in this instance the female was killed, and the male brought a new mate to the old nest. I cannot from experience prove, but it seems most probable, that there is more certainty of the return of the female to the same place with a new partner, when some accident has befallen the male, since she has more to do with the cares of incubation. I hope some one more competent to write on migration will give their views in future numbers of 'The Zoologist.' —*John Heppenstall; Upperthorpe, near Sheffield, June* 17, 1842.

The Osprey, (Pandion Haliaetos). Three specimens, shot near Sheffield, have come under my notice. A fine male in my collection I received alive, but very far spent, it having been kept more than a week in a close attic, where they had vainly endeavoured to feed it

with meat instead of fish. I had it killed, as it had completely lost its sight and appeared to be suffering greatly.—*Id.*

Note on Woodcocks and Snipes. Two woodcocks (*Scolopax rusticola*) were killed last June, on the moors of James Runnington, Esq., and a full-grown young bird, which I purchased and skinned, on the 8th of June: they breed most years in this district. Snipes' nests are common on the Thorne moors, where I have repeatedly seen them: they, with woodcocks, are often killed the beginning of grouse-shooting, (12th of August).—*Id.*

Additional Note on Migratory Birds. During September Butalis grisola resorted to the roofs of houses, the warmth of the slates supplying food and a more suitable temperature. All the warblers and flycatchers disappeared about the 24th of the month. On the 4th, 5th and 6th of September large companies, chiefly martins, were flying about the town; these all disappeared about the 20th, while about our house, from the beginning until the end of the month, there were more swallows than I have seen for many years, but only one or two solitary martins. On the 29th of September, while travelling on the York and North Midland Railway, I saw many thousand swallows, their chief rendezvous was near the Sherburn station. On the 4th of October one swallow was flying about the barracks; on the 6th about twenty swallows were on a house at Crookes, making their usual migratory sallies; the night had been very frosty. October 11th, two swallows, young birds, were flying about the same place; since that time, although I have been very particular in observing the birds, I have not seen, either there or anywhere else, anything like a swallow, they all, no doubt, having reached a more genial climate. — *Id. November* 9, 1842.

Note on the occurrence of Birds on board ship. So little is or can be known with regard to the fate of the companions of our summer months, after they have once left us on their long and distant flight, that however trivial the following remarks, I shall not hesitate to send them.

Whilst passing down channel on my way to Madeira, in the month of October, several birds paid us a short visit. After we had cleared the Lizard Point, and were at a distance from any land, a short-eared owl, apparently on a trip of pleasure, if we might judge from the leisurely way in which it seemed to go about it, after tarrying with us some time, making its beautiful hawk-like circles near above us, directed its flight right out to sea.

Each evening, towards sunset, we had several small birds to roost

upon our rigging; we used to feel great pleasure in watching their arrival, ere we went below for the night.

One evening, when we were upwards of two hundred miles from land, and our other friends had left our lonely bark, a thrush, but of what species I could not make out, though I believe it was a redwing, took up its quarters on the top-gallant yards. The next evening it returned, and on the following, just at the time when, had it been on shore, it would have sought some favourite tree, it came to us again. Several times during this last day I had watched it till I was weary, flying about at a short distance from our ship, and thought if it had thus spent the three days of our acquaintance with it, how thoroughly sea-sick it must be. We had all this time been running along ten knots an hour, and had probably lured it farther and farther from its home. How it had borne the fatigues of the three days of its ceaseless flight around us, and what its after fate, were thoughts that would often recur to us, as each breeze shortened the distance of our own migration.

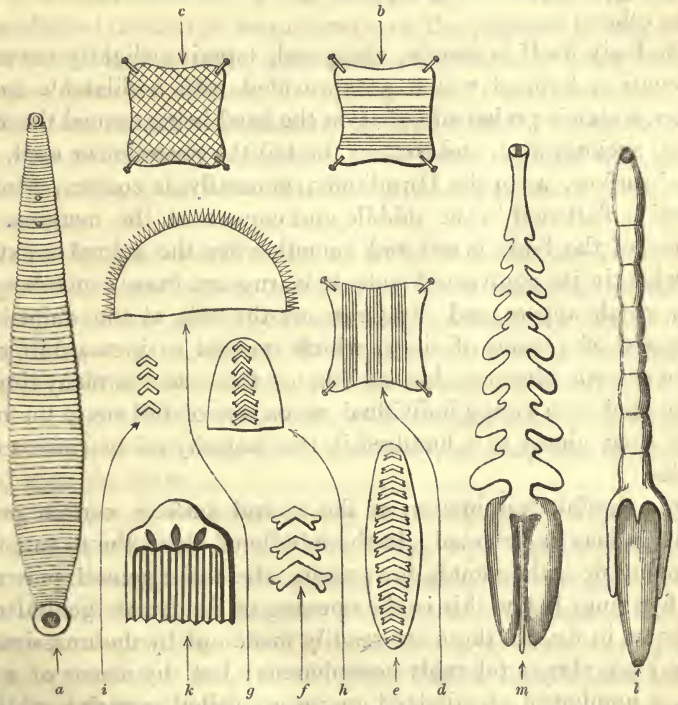
Whilst crossing the Bay of Biscay, at our greatest distance from the land, we observed a flock of whimbrels coming towards us at a most rapid rate. It was their last flight — their last eager struggle to preserve life. Some fell short of us, too much exhausted to reach the goal; others overshot their mark, and a few came down heavily upon the deck, and soon died. As we coasted along the European shore, many birds came on board almost daily, chiefly sky-larks and pipits.

On my return voyage in the beginning of April, whilst keeping near the coast of Spain, the deck of the steamer was a perfect levee daily, and a scene of the liveliest interest. Whilst the chimney-swallow and the sand-martin continued to fly round and round us, wheatears, whinchats, various species of warblers, redstarts, red-backed shrikes, &c., were constantly passing to and fro, each appearing to me as if it had put on its gayest apparel for the occasion. I certainly thought that the colouring of their plumage appeared brighter than the same birds do with us; and I remember we made a similar remark with regard to the birds we saw in Norway. — *W. C. Hewitson; Kingsdown, Bristol, October* 29, 1842.

Affection of the Sparrow for its young. A few years ago I was sitting in a cottage, when my attention was attracted by an unusual screaming of a small bird. I immediately went to the back door, and saw that it proceeded from a house-sparrow that was fluttering about on the wall, at the base of which was a duck with something in its bill, which it was endeavouring to swallow. Upon attentively ob-

serving it, I found this to be a callow nestling, and from the agonies of the poor sparrow there was no mistaking the parent; the feathers of the latter were all erect, and it continued hopping and fluttering about, and uttering the most distressing cries for the loss of one of its young, which I suppose had fallen out of the nest. — *James Bladon; Pont-y-pool, September 4th*, 1841.

On the Minute Anatomy of the Horse Leech, Hæmopis sanguisorba, (Sav.), *Hirudo vorax*, (Johnston). By JOHN QUEKETT, Esq., M.R.C.S.L.



a. Ventral surface of the horse-leech. *b*. Stratum of muscular fibres running transversely; these are situated immediately underneath the cutis. *c*. Strata of muscular fibres running obliquely. *d*. Stratum of muscular fibres, running in a longitudinal direction. *e*. Jaw of the horse-leech, showing the fifteen teeth. *f*. Detached teeth of the horse-leech. *g*. One of the jaws of the medicinal leech, showing the teeth. *h*. Part of the jaws of the medicinal leech exhibiting the teeth as seen from above. *i*. Detached teeth of the medicinal leech. *k*. The upper part of the œsophagus of the horse-leech, laid open to show the longitudinal rugæ and the three cartilaginous jaws *in situ*. *l*. Alimentary canal of horse-leech. *m*. Alimentary canal of the medicinal leech.

THE subject of the present paper is referred by Cuvier to that family of Annelides termed Abranchious, and is characterised by having

a body destitute of bristles for locomotion, completely apodous, and without soft appendages, a prehensile cavity, in the form of a sucker, at each extremity of the body. Head not distinct, but generally provided with eyes and jaws.

External form. The common horse leech varies but little in size; it rarely exceeds three inches in length in its contracted state: the general colour is dark green, sometimes inclining to black on its dorsal, and green or greenish yellow on its ventral aspect; on some specimens a few irregular black dots occur in various parts, and in others the dots are so numerous, and approach each other in a linear series so closely on the back of the animal, as to give the appearance of two black lines or bands, running from one extremity of the body to the other.

The body itself is simple, elongated, tapering slightly towards the extremities, both of which are provided with a dilatable cavity or sucker, which is prehensile, that on the head being termed the anterior or oral sucking disc, and that on the tail the posterior or anal. The dorsal surface, as in the Hirudinidæ generally, is convex, whilst the ventral is flattened in the middle and convex at the margins. The surface of the body is soft and smooth when the animal is extended, but when in its contracted state it is rugose, from a number of papillæ which appear and disappear at the will of the animal; it is composed of a series of rings, which are said to increase in number as the growth advances, but such is not the case; as many rings may be counted on a young individual as on one of full size; the number varies from ninety to a hundred in the majority of specimens of this species.

On a careful examination of the ventral surface, certain pores or openings may be detected: in the middle of about the twentieth ring, reckoning from the mouth downwards, the male genital pore occurs, and five rings below this is the opening of the female genital organs, as shown in fig. *a*; these are readily made out by the unassisted eye, as they are always tolerably conspicuous; but, by means of a pocket lens, a number of equal-sized apertures, called spiracles or stigmata, may be seen, arranged in two rows, one on each side of the body; they occur at every fifth ring, and communicate with some little sacs or cavities, which are of a white colour, and in general are filled with an opaque white fluid when the animal has been dead some little time, but in a living leech the fluid appears as transparent as water: their supposed use will be adverted to in a subsequent part of this communication.

Cutaneous system. The cutaneous investment may be divided into three layers, — the epidermis, the pigmental layer, and the dermis or true skin. The epidermis is soft and easily lacerable; it is so thin that it cannot well be dissected away from the pigment, but by maceration in turpentine or weak acid it will easily separate from the other layers; it is periodically shed, like that of the frog and snake, and consists principally of tesselated epithelium. The pigmental layer consists of a series of minute cells of an oval figure, containing colouring matter, which on the dorsal surface is of a dark green, but on the ventral of a yellow colour; in some parts the cells are arranged in a series of diamond-shaped figures, as if they followed the course of the blood-vessels or the oblique layer of muscular fibres: in the medicinal leech the arrangement of the pigment is very beautiful, but in the species under consideration, from there being little or no variation from two colours, the arrangement is comparatively simple. The true skin is so intimately blended with the muscular tunic as to be very difficult of examination; it is freely supplied with nerves and blood-vessels, is of a reddish colour, and appears to be of a fibrous nature.

The muscular tunic itself, upon a careful examination, is found to be composed of three strata or layers of fibres, running in different directions: the layer nearest or immediately underneath the cutis is composed of a series of circular fibres; these are arranged in bundles, quite distinct from one another, and the breadth of the rings is determined by the number of fibres in each bundle, (fig. *b*); it requires very great care to see these fibres distinctly, as they are in general removed with the cutis.

The next layer is composed of two strata of fibres, which are arranged in a spiral form around the body, each stratum taking an opposite direction to that of the other, so that by the continual decussation of the fibres of each stratum taking place a diamond-like appearance is produced, (fig. *c*). The innermost layer of all is composed of fibres, arranged also in fasciculi; these take a longitudinal course from the head to the tail of the animal, (fig. *d*); the fibres composing these fasciculi are much larger, and the layer itself more developed, than either of the two preceding, which can readily be accounted for when we consider that these are the fibres which are most used in the ordinary locomotion of the animal. At the head and tail the whole of the three layers of muscular fibres are at first slightly constricted, and they then expand to form the sucking discs; the circular layer is the most conspicuous, and is best developed on the outer margin of each

sucking disc, and forms a band about a line in breadth around this part. The radiating fibres can very well be seen extending from the centre to the margin of the anal disc. The muscular fibres themselves, when examined microscopically, with a power of five hundred linear, exhibit little or no trace of transverse striæ, and the primitive fibrillæ of which each fibre is composed are barely perceptible, nothing but a slight dotted appearance being presented, which seems to be characteristic of the muscular fibres in these Hirudinidæ; the average diameter of the fibres was about the one thousandth of an inch, and many of them appeared to be pointed at one end.

Digestive system. The mouth is situated at the anterior extremity of the body, on the ventral surface, immediately behind the sucking disc; it is of an oval shape, and composed of fleshy lips, which are rendered thick and soft by the concentration of the fibres investing the whole of the body, and by those which are continuous with the muscular œsophagus, which are here thrown into an orbicular figure: at the point where the mouth joins the œsophagus there are three cartilaginous jaws; * they are placed in a radiating manner, and form with each other an angle of about 180°; they project some little way into the mouth, and in the medicinal leech they can readily be felt to grate against a metal instrument when it is passed into the mouth; each jaw is of a semicircular figure and of a white colour, and is provided with fifteen teeth-like appendages (fig. *e*); they are of a flattened or conical figure, and are arranged like so many inverted V's on the upper curved surface of the semicircular cartilaginous jaws; they are broader at the base than at the apex, and the basal extremities are slightly indented; the middle tooth of the fifteen is the largest, and the others gradually diminish in size to the outside, where they are only half as large as the middle one. In leeches which have been dead some little time, and slight decomposition has taken place, these conical teeth, by pressure, will readily divide at their apices, and give one the idea of there being two rows instead of one, while, in the recent state, the line of separation is scarcely perceptible, but by macerating them they will easily separate: it must have been this accidental separation that has led many authors, and amongst them Moquin Tandon, to describe and figure two rows of teeth in each jaw.

The jaws themselves are firmly imbedded in strong muscles, which are disposed in such a manner as to move them backwards and for-

* What are here termed jaws are called teeth by most authors; I apply the term teeth to the little calcareous bodies on their free surfaces.

wards, as in the act of biting with great force and rapidity; one muscle appears to be continuous with that of the œsophagus, and is attached to one extremity of the jaw, whilst another is attached to the opposite end, so that by their alternate contraction and dilatation the jaws have a semicircular movement.

But the dental apparatus of the medicinal leech is much more marked than in this species, and this fact, combined with the striking differences in their alimentary canals, affords a most satisfactory explanation of the reason why the horse leech is unfit for medical purposes, for instead of the fifteen blunt molar-like teeth with which the latter is provided, the jaws of the medicinal species are much larger, more convex, and of very much firmer consistence; each jaw is provided with a row of teeth, varying from sixty to eighty in number; their points or apices are much sharper than those of the finest needles (fig. *g*); they are likewise strongly imbedded in the cartilaginous matter of the jaw: in the horse leech, on the contrary, the teeth appear to be loosely connected to the upper part of the jaw, for when a leech has undergone slight decomposition the little calcareous teeth readily separate from it, and, on examining the mouth and squeezing it, the three sets of teeth will be found quite detached, being only entangled in the mucous matter, which is always very abundant at this part; they can then be washed in water and placed on glass, and mounted as microscopic objects.

I cannot forbear mentioning, in this place, an error which is likely to be committed in describing the shape of the teeth: if the jaws of the medicinal leech be examined, when laid on their sides, the teeth appear like so many sharp-pointed canines, imbedded, like the teeth of Mammalia, to half their depth in the cartilage of the jaw, all that part projecting above the margin of the jaw being of a darker colour than the remaining half which appears imbedded in it: that this is deceptive may be at once proved by turning the jaw in such a manner that the cutting edge may be seen (fig. *h*); the teeth then will be found to be of precisely the same figure as those of the horse leech, (fig. *f*), the only differences being that they are more numerous and much sharper than in the latter animal. Having fallen into this error myself, and only by mere accident discovered the mistake, I have thought proper to caution others: Moquin Tandon has represented two rows of teeth in each jaw of the medicinal leech, and makes each tooth pointed like a canine; in this he is certainly wrong.

JOHN QUEKETT.

(To be continued).

*Notice of Works lately published on the Hive Bee.**

Τις την μελιτταν, την σοφην την εργατιν
Γεωμετρειν επεισε, και τριωροφας
Οικας εγειρειν ἐξαγονων κτισματων.

PISIDIUS.

"AMONG all the creatures which our bountiful God has made for the use and service of man, in respect of great profit and small cost, of their ubiquity, or being in all countries, of their comely order and continual labour, the bees are most worthy our admiration." So says Sir J. More, and so thinks Mr. Cotton: for his treatise on bees entitled 'My Bee-Book' is a rare and pleasant book, not only in its original matter — if anything concerning bees can be called original — but in its varied and interesting reprints. In the history of the hive bee are two eras; the first extending from the invention of letters to the publication of Huber's "observations;" the second from that date down to the present time. During the first period the bee was zealously cultivated, its instinct extolled, its labours admired, its honey prized, and its history faithfully recorded, more especially by Reaumur; yet in the work of poor blind Huber, there is something so complete, so masterly, so ably recorded, that from the moment of its appearance there has been no second authority consulted — no other source of information. His very errors — and some slight errors have crept in — are copied with a religious and unhesitating faith that bespeaks more than language the estimation in which he is held. The works dated *ante Huber* were immediately laid aside, and, like Virgil's poetical recipe for the creation of bees, have been regarded as little better than apocryphal.

It is or it ought to be generally known that Huber was blind from his early youth, and that the delightful history of the honey bee recorded in his works is the result of the patient watching of his faithful servant Francis Burnens. This man was first employed to read works on Natural History to his master, and it was only by degrees that he was entrusted to make those observations which have acquired for his master such universal reputation. "We began" says Huber "to mark the bees in glass hives; we repeated the experiments of M. de Reaumur, and we obtained exactly the same results when we employed the

* *My Bee-Book.* By WILLIAM CHARLES COTTON, M.A. London: J. G. F. & J. Rivington. 1842.

The Honey Bee, its Natural History, Physiology and Management. By EDWARD BEVAN, M.D. London: Van Voorst, Paternoster Row. 1838.

same means. This agreement between his observations and our own gave me great pleasure, for it proved to me that I could entirely rely on the eyes of my scholar."

From this passage it will be observed that Huber thought this accordance with Reaumur a signal proof of correctness; and does it not lead us also to the conclusion that compilers have been somewhat too hasty in assigning so exclusively to the former the attributes of a bee-historian? It is impossible to turn to the pages of Reaumur without finding abundant proof of the care, accuracy and completeness of his observations. How interesting is that passage where he relates how and when for the first time in his life he saw a queen! How truly we sympathize with his feelings of disappointment when he found her unattended! And how heartily do we participate in his gratification when at last twelve or fifteen bees ranged themselves around her, to form her guard of honour! He tells us that a large party were at his house, to whom he had related the mysteries of the hive, and that they were all on the tiptoe of expectation to see the renowned sovereign. But let us turn to Mr. Cotton, and with him take a peep into one of his own hives.

"I myself saw what I am going to tell you. This and the two next stories will, I hope, prove my right to belong to the family of Eyes, though, without strong glasses, I am nearly as blind as poor Huber was. I have a hive called the Observatory Hive (because in it I can observe or watch all the Bees do),—as Huber would say, *mark all their manœuvres;* it is made of two plates of glass placed in a frame, just one inch and five eighths in the clear; this gives them room to build one comb and no more, so I can see every Bee at work, and not even the Queen herself can long hide from me. I put a swarm in, and they built a comb, which, by a sudden jerk, was broken off from the top. I knew the Bees were not strong enough to lift it up into its place, so I was curious to see what they would do, and I watched them narrowly. They first held the broken piece of comb in its place, just as Huber saw their first cousins the Humble Bees do; they next made wax, and fixed the broken comb firmly in its place; they then went on to saw off, with their sharp and strong jaws, just enough of the comb which pressed against the glass, to let themselves pass. One poor Bee had got pressed between the plate of glass and the comb; they very kindly began to saw away the comb in that place which set the poor Bee soonest at liberty; they might have begun any where else, but instinctive kindness led them to begin where they did. This they did more evenly than I could have done for them, the size of their bodies being the rule by which they worked. A razor could not have cut sharper. Last of all, they lengthened the cells on the other side, so that the whole comb was the same thickness as before, though made of long cells on one side, and short on the other.

"Another time I saw a Bee in the same fix, for he had slipped down with his feet to the glass, and his back towards the comb, so that he could not get a firm hold, to exert that power which was needful to set him free. Another Bee saw his hard case, and went straightway to succour him, laid hold of his hind legs with his jaws — tenderly, no doubt; but I am sorry to say, he did not stand by him till he got free.

"I had a strong stock in a straw Hive; on the top of this I put a large glass, which they soon filled with comb, as I kept the light quite out. This glass had a flat wooden top, with holes to put bell glasses on; these, of course, I could take off whenever I pleased, and so drop anything into the Hive. I one day took a single flower of stock, which, I should think, weighs as much as twenty Bees; this I popped through the hole into a party of them who were hard at work. They were, of course, rather surprised to see this large flower tumbling in upon their heads; they seemed to say to themselves, "*Hilloa* (*Buzz*), *where does this come from? It has no business here; but* "*as it is very certain that it has not grown larger whilst it has been in our Hive, we can* "*turn it out of the hole through which some spiteful fellow has dropped it in upon us.*" Hilloa, translated into the Bee tongue, is, I am sure, *Buzz-buzz;* but I am sorry I am not sufficiently versed in Bee speech to set down therein the rest of what they said. I must, therefore, be content with plain English. But I am sure, from what they did, that I understand them, nevertheless. "Spiteful fellow," said the Bees. (Now I was not really spiteful, I only wanted to show how clever my Bees were). "*We will not* "*take the trouble to carry it all through the Hive to our proper door-way, and so disturb* "*all the Bees who are hard at work, but we will carry it again to the upper chamber,* "*from whence we all saw it drop, and there turn it out, as it has no business here.*" No sooner said than done. They seized it with their strong jaws, carried it up into the bell glass, and worked it round and round, trying to find the hole through which it had come. But I had been before them there, as I had put the bell glass back into its place. They could not find the way out, and after a time the flower dropped down again into the Hive; they would not be so beat, and pulled it up again at least a dozen times, till I, like Huber, pitying their hard case, took the bell glass off again, and merrily did they fly away with the hated flower; they then went round to the front entrance, and, I have no doubt, told the Queen all they had done, but, I am sure, did not *boast what great Bees they were.*

"I saw, whilst all this was going on, what gave me a great idea of the strength of the Bee,—one alone, who had a strong gripe of the flower, dragged it up the side of the glass, whilst six others were hanging on to it."—p. 263.

Mr. Cotton appears to be one of those men who make the happiness of their poorer neighbours a leading object of their lives; and it matters not whether the happiness is to be induced by the cultivation of their gardens, the rearing of silkworms, the fattening of their hogs, the management of their bees, or the thousand other pursuits that may innocently if not beneficially employ their minds, while it brings food and clothing to their homes. Blessed is the man who by his own intelligence, and by the influence of his own bright example and his own kind spirit, can improve the condition and add to the happiness of those around him.

The enthusiastic author of 'My Bee-Book' may be said by some to ride his favourite hobby rather too hard; but those who think thus are wrong: it is the want of enthusiasm—the listless indifference of a writer that spoils his book; a man cannot be too full of his subject.

"I would most earnestly beg the aid of the clergy and resident gentry, but, above all, their good wives; in a word, of all who wish to help the poor who dwell round about them in a far humbler way, yet perhaps not less happily; I would beg them, one and all, to aid me as an united body, in teaching their poor neighbours the best way of keeping Bees. Many people think the poor may be helped most by giving them small allotments of land. I think this may do much; and I will, whenever I am able, help on this plan. But much difficulty is often found in getting land; and I do not think it is so certain or so safe a way of doing good, as by giving a poor man a stock of Bees, and then showing him how to take care of them, and to profit by them; for digging is thirsty work, and the beer-shop often stands hard by the allotment: so, although the labourer after his daily toil may go by himself to his plot of ground, yet he is very likely to find one or two gardeners, thirsty like himself, to walk home with him, but before they get there to drop into the beer-shop; and when once there, snugly seated in the chimney corner, neither I, nor, what is worse, their poor wives, can tell when they will get out of it. But a row of Bees keeps a man at home: all his spare moments may be well filled by tending them, by watching their wondrous ways, and by loving them. In winter he may work in his own chimney corner, at making Hives both for himself and to sell. This he will find almost as profitable as his Bees, for well-made Hives always meet a ready sale. Again, his Bee-hives are close to his cottage door; he will learn to like their sweet music better than the dry squeaking of a pot-house fiddle, and he may listen to it in the free open air, with his wife and children about him. They will be to him a countless family. He will be sure to love them if he cares for them, and they will love him too, and repay all his pains. Many a lesson a man and his wife may teach their children at the mouth of their Hives; for a Bee-garden is only second to a Sunday-school."—Preface, xliii.

Although our author has made, and apparently without effort, a most amusing book, his objects, observable in every page, seem the benefit of the cottager and the welfare of the bee, rather than the amusement of the reader. He insists most strenuously on the worse that inutility of killing the bees; maintaining at great length, and with sound reasoning too, that it is not merely more humane but more profitable to save their lives. The substitute for killing is intoxicating the bees: this is accomplished by filling the hive with the smoke of an ignited puff-ball. "You may find in the damp meadows a fungus which children call frogs' cheese and puff balls. When quite ripe if you pinch them a dirty powder like smoke will come out. Pick them when half ripe. The largest are the best, and they often grow to the size of a man's head. Put them in a bag, and when you have squeezed them to half the size, dry them in an oven after the bread is drawn, or before the fire." When dried, this fungus will burn like tinder: it is to be put by, and when required for use "you should get a little tin box fitted to the nose of your bellows, having a sort of spout coming from it which fits the door of your beehive. Take a piece of fungus twice the size of a hen's egg, light it, and when it burns freely

put it into the box." You are then to fit the nose of your bellows to one aperture in the tin box, and blow the smoke into the hive through the other, stopping the spout of the tin box with wet clay, if it does not quite fit the door of your hive.

"The Bees at first will make a great buzzing; in about five minutes all will be as still as death. Lift the Hive gently off, and turn those Bees which have fallen on to the bottom board into a large white dish. They will be quite harmless and still, as if they had been burned with brimstone; but the fungus does them no harm; it only makes them drunk, which is very good for Bees, though bad for men, as they get well in twenty minutes, have no head-ache next morning, and are all merrier afterwards, and it was not their fault that they were so *overtaken*. Look for the Queen Bee, which may be easily known from her likeness to the Cut [?]. It is well to have many people round the table to search for her, as also to cut out the combs and sweep the BEES off; for many hands, as well as eyes, are better than one. If you find her at first, put her softly on one side, and sweep all the other stupid Bees with a feather into the white dish. Then cut the combs carefully out, one by one, and if you have not already found the Queen, look sharp for her on each comb. Nine times out of ten she does not fall down, but holds fast to the top of the Hive, in the very middle: so that the sharp man — sharp as a Bee's sting, like Joseph Barnet — who keeps the Hive in his own hands, and cuts the combs out (mind you do it carefully, or you may be so unhappy as to become a REGICIDE), has a much better chance of finding her majesty than those who are hunting for her among the Bees that have fallen down. If you are only going to take the combs out of one Hive, and wish to make sure that there is a good healthy Queen in the other in which the united stock is to live, you may get a sight of the Queen in this way; we will suppose that she has not fallen down with the rest, for, be the reason what it may, the Queen is stupified by the fungus less easily than the vulgar herd, either the Bees in their loyalty crowd round her, and so ward off the fumes as long as they can, till they themselves drop, or she has a stronger constitution than the rest; be this as it may, she very often does not drop from among the combs. In order to get a sight of her, turn the Hive upside down, combs, Bees, and all; then blow a little smoke through the bung-hole in the top of the Hive, which is now the bottom, put a thick cloth over the Hive, and the Queen will be among the first who will crawl up to its upper edge; seize her, USE HER TENDERLY, FOR ON HER the lives and happiness of thousands depend; then go on with your work. Pour the Bees all back into the Hive from which you have cut the combs, and set it in its old place till the evening. You ought to leave little bits of comb sticking to the top of the Hive, about which the Bees, whose honey you have taken, will cluster like a new swarm; they will set about clearing out the broken bits of wax and putting the Hive straight, as fast as they can. Anybody who does not know what you have done, who comes into your garden, would think this your strongest stock, instead of being a kingdom of paupers without a Queen. In the evening blow a little smoke into the strong Hive which stands next to them: when the Bees are a little quiet, turn it up gently, and pour some large spoonsful of honey and water, or sugar and ale, into the combs where most Bees are clustered together. Put three bricks on the bottom board, so that when you set the Hive down again, no Bees may be crushed; then take the Hive from which you took the combs in the morning, and, with one smart blow, knock all the Bees out upon the bottom board of the strong hive whose Bees you have sugared. Set their Hive gently in its place on the bricks, over the Bees which you have

just knocked out; they will begin to lick the first drops of honey which trickle on to the board, and will be led up by the scent of that which you have poured into the combs, to mix themselves with the other Bees.

"They will take to one another when they have helped each other to clean off the sugar with their tongues. The fact of their helping each other in their troubles makes them friends, just as it does grown men, and children, who are small men and women." —p. 68.

The entire detail of management is thus unfolded and explained in plain unadorned language; and you cannot resist the conviction that the author is well acquainted with the subject on which he is writing. This cannot be said of many authors of bee-books: these works are for the most part such wretched compilations, that one scarcely ever by chance meets with a paragraph in them worth the trouble of reading. Mr. Cotton, like the rest, has drawn abundantly from other sources, yet it is all fairly done; the original and copied parts of his book stand out distinctly from each other; there is no appropriation of another man's property without acknowledgment: all is fair and above-board even to the "Prelude of Mottoes," extending through five pages; a rare selection in truth, and a fair quiz on a prevailing passion.

We must give one quotation from More's 'England's Interest,'* reprinted in 'My Bee-Book;' it includes Queen Elizabeth's receipt for making metheglin, and the author's encomium on that highly prized and ancient beverage.

"Take a bushel of sweet briar-leaves, as much of thyme; half a bushel of rosemary-leaves, and a peck of bay-leaves; and, having well-washed them, boil them in a copper of fair water: let them boil the space of half an hour or better, and then pour out all the water and herbs into a fat, and let it stand till it be but milk warm; then strain the water from the herbs, and take to every gallon of water, one gallon of the finest honey, and beat it together for the space of an hour; then let it stand 2 days, stirring it well twice or thrice a day; then take the liquor and boil it again, and skim it as long as there remains any scum; when it is clear, put into a fat as before, and let it stand to cool. You must then have in readiness a kive of new ale or beer, which as soon as you have emptied suddenly, presently put in the metheglin, and let it stand three days a working, and then tun it up in barrels, tying at every tap-hole, by a packthread, a little bag of beaten cloves and mace, to the value of an ounce. It must stand half a year before it be drank.

"As the vertues of honey are transcendent, so are the vertues of meath and metheglin: when old, it is a wine most agreeable to the stomach. It recovereth, 1. A lost appetite. 2. It openeth the passage for the spirit and breath. 3. It softeneth the

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* 'England's Interest: or, the Gentleman and Farmers Friend,' &c. By *Sir J. More.* London, Printed and Sold by *J. How*, at the Seven Stars in *Talbot-Court*, in *Grace-Church-Street*, 1707.

bowels. 4. It is good for them that have the cough or ptisick. 5. If a man take it not as his common drink, but every now and then as physick, he shall receive much benefit thereby, against quotidian agues, cachexies, and against all the diseases of the brain, as the epilepsy, &c. for which wine is pernicious. 6. It is very good against the yellow-jaundice. 7. It is also a counter-poison. 8. It nourisheth the body, and is consequently good against the consumption, and all emaciating diseases. 9. It is the best thing in the world for the prolongation of life. Pollio Romulus (who was a hundred years old) imputed the continuance of his health to this soveraign liquor, who, being asked by Augustus the emperor, by what means especially he had preserved that vigour, both of mind and body; his answer was, *Intus mulso, foris oleo*, by the use of metheglin inwardly, and of oyl outwardly. The same thing is manifested from the example of the ancient Britains, who have all along been addicted to meath and metheglin, and than whom no people in the world had more clear, beautiful and healthful bodies; of whose metheglin, Lobel writeth thus: *Cambricus ille potus methægla, est altera liquida, et limpida septentrionis theriaca.* The British metheglin, says he, is a sort of liquid and clear treacle of the north."—p. 133.

Dr. Bevan's 'Honey Bee' is a well known work on the same subject: its publication will be fresh in the memory of many of our readers: the estimation in which it is held is sufficiently manifested by the call for a second and enlarged edition. It is our honest wish that each of these works may bring an abundant honey-harvest to its author, and thus remunerate him for his labours on behalf of bees and men. K.

Short Communications about Insects.

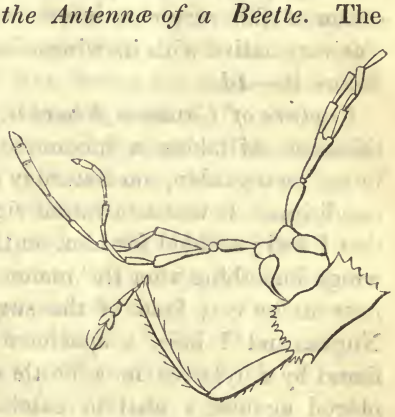
Description of Erycina Margaretta, (White). Wings above and below bright saffron yellow; the upper wings above, at the tips, have alternate bars of dark brownish black and white, diminishing in length towards the posterior tip, where the orange-saffron colour of the general surface runs to the margin, forming a short bar, as broad as two of the others taken together: this is followed by a small, triangular, brownish-black spot; the dark brown bars and this spot line the nervures of the wing at the end: — in the lower wing the saffron colour, near the margin, is digitated; at the end of each of the "fingers" is a small white spot; round the posterior margin there are six triangular black spots, each of which seemingly is traversed by a vein. The under side is very similar to the upper — the white spots round the margin of the lower wing are much larger, and occupy nearly all the orange-saffron "finger."

Hab. Central America: Honduras. British Museum, (one specimen).

In the system this little fairy "Erycina ridens" may perhaps come near *E. Mantus*, Cramer, Pap. Ex. i. 74, pl. 47, f. F. G: the antennæ in *Mantus* are much more slender, especially at the end.

Hereafter a group may be found resembling this, when perhaps a careful examination of its nervures, head and legs, as well as of the structure and habit of the larva, may mark it out as a subgenus of Erycinidæ—(Agathina), the type being E. (A.) Margaretta, a name given by me from the French appellation of the daisy or gowan (*Bellis perennis*, Lin., *Marguerite* of the French), the petals of which somewhat resemble in shape the longish white marks on the upper wings of this little butterfly. A daisy growing by the road-side near Whiting Bay, Isle of Arran, in August last, particularly attracted my notice, as it seemed to smile on me as I passed. The beautifully simple lines of Charles Lamb, "To Margaret W——." afterwards struck me; and partly in allusion to the name, but chiefly to the petals of Burns' "wee, modest, crimson-tipped flower," I have named this pretty little Honduras Erycina. — *Adam White; August* 5, 1842.

Singular case of monstrosity in the Antennæ of a Beetle. The figure in the margin represents the head of a Prionidous beetle, closely allied to, if not identical with, the *Macrotoma Senegalensis* (Prionus Senegalensis, *Olivier*), in which the antennæ are monstrously developed, the elongated third joint being forked and emitting from the end of each "prong" a part of a distinct antennule. In one case the third joint is cleft nearly to the base, in the other only at the tip. In Asmuss' 'Monstrositates Coleopterorum' this instance would, of course, be arranged in his third division, "monstra per excessum," and under his section C, "Partes supernumerariæ antennarum," answering in some respects to the monstrosity he copies from Doumerc of Carabus auratus. In Helops cæruleus, M. Seringe, in a paper read before the Linnean Society of Lyon, pointed out the occurrence of an example with three joints proceeding from the fifth joint of one of the antennæ; but as far as I am aware, no instance has been registered before this, of the existence of monstrosity on both sides, the same joint in both cases being the "freak-originator."



The Probænops described and figured in 'The Entomologist,' at

p. 406, together with this beetle and many other interesting insects, among others a seemingly new species of Paussus, near P. Klugii, were lately brought to this country by the Rev. D. F. Morgan, the late indefatigable colonial chaplain at Sierra Leone, who, by three valuable presentations of insects to the British Museum, has very materially increased the value of the collection.—*Id.*

Polia occulta. I captured a pair of this rare species here this week, a female on the 1st, and a male on the 4th; they were both sucking sugar which I had placed on the trunks of some trees to attract moths. —*H. Doubleday; Epping, August* 6, 1842.

Captures near Guildford.

Thecla Betulæ	Tiphia femorata	Cryptocephalus sericeus,
Polyommatus Adonis	Chalcis MacLeanii	(a purple variety).
Cynthia Cardui	Gomphoderus rufus	Dasypoda Swammerdam-
Myrmecina Latreillii	Cryptocephalus bilineatus	Sphegina nigra [ella

J. F. Stephens; Vicarage, Shalford, near Guildford, Aug. 21, 1842.

Lebia Crux-minor. In brushing for Diptera, &c. in the woods at Unsted, near Godalming, on the 27th instant, I caught a single specimen of this very rare insect, which evidently flew into my net; it was very active with its wings, and required some little dexterity to secure it.—*Id.*

Capture of Catocala Fraxini at Hammersmith. I had the gratification of taking a specimen of this rare and magnificent insect in my own garden, on Saturday evening last the 3rd instant, in fine condition. It was a beautiful sight to see him feasting on the sweets that I had provided for him, on the trunk of an apple tree, raising his wings something after the manner of a butterfly. The Catocalæ appear to be very fond of the sugar, for I very frequently meet with Nupta, and I have a specimen in my cabinet of Fraxini that was found by a relative in a bottle containing beer and sugar, that was placed against a wall to catch the wasps, in October, 1838, near Arundel in Sussex.—*Samuel Stevens;* 38, *King Street, Covent Garden, September 5th*, 1842.

Capture of Colias Hyale and Argynnis Lathonia. On the 3rd of September I captured two of our rarest butterflies—Colias Hyale and Argynnis Lathonia,—in less than ten minutes. C. Hyale was taken about two miles and a half from Lavenham, on the Long Melford road. It is the third specimen I have taken in this locality, and was making its morning repast from the flowers of the autumnal hawkbit and dandelion, and was enclosed under the net while feeding on the blossom of the latter plant: there were many fine fields of clover in this neigh-

bourhood, which I paid great attention to, but they did not produce me a specimen. A. Lathonia was captured in a small almost barren pasture adjoining the road, and was also taken from a blossom of the dandelion; soil heavy clay. I should be extremely obliged if you would inform me whether this be the usual time of this butterfly's appearance.—*W. Gaze; Lavenham, Suffolk, October* 6, 1842.

Enquiry respecting a stridulant Insect. You would oblige me were you to let me know the name of a little stridulant creature, to which I frequently listened during the silent watches of the night in the month of August. My *elegant* bed-chamber was in a heath-thatched cottage in the island of Arran; and before I fell asleep, and when I awoke during the night, I generally heard a low stridulous sound proceeding from something near the bed. It was like a watchman's very very feeble rattle — much more feeble than the sound of the grasshopper; and it was continuous, lasting however only while I could deliberately count three or four. It was repeated at irregular intervals of a minute, or rather more. The only inmates of the cottage I could willingly have dispensed with, were strolling parties of Goerius olens, or the "devil's coach-horse;" but whether this was the guard blowing his horn, the deponent knoweth not. If so, he could have wished brighter angels to guard him during his slumbers. — *D. Landsborough; Stevenston, Ayrshire, October*, 1842.

[Your correspondent will find in Kirby and Spence's 'Introduction to Entomology,' ii. 381-2, an account of the insects which most likely produced the sounds he heard in "Archie Hamilton's cottage," at Knockingelly. They were probably produced by "little beetles belonging to the timber-boring genus Anobium,"—perhaps A. tessellatum, *Fabr.* The Atropos pulsatorius (*Termes pulsatorius*, L.), so commonly found amongst books, dried plants, &c., is also believed to make a slight noise, and in fact has derived its specific name from this circumstance.—*A. White;* 61, *Judd St., London, Oct.* 11, 1842.]

Deilephila Galii. A fine male specimen of this insect was taken on the 15th of September on a heap of stones at Whitefield, near Bury, a few miles from this place. — *R. S. Edleston; Cheetham, Manchester, November* 3, 1842.

Acherontia Atropos. On the 22nd of September Acherontia Atropos (fem.), flew into a house near Heaton Park, to the great alarm of some females assembled at tea; the utterance of its shrill cry made the matter worse: fortunately it was rescued from destruction. About the same time a male specimen was captured on the highway near Staley Bridge. These and the above specimen of D. Galii are in my

cabinet. A. Atropos has been rare in this quarter for some years; I doubt not the very favourable weather this season may have caused its appearance elsewhere.—*Id.*

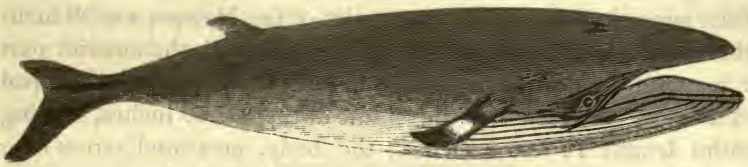
Nest of Vespa britannica? About a week ago a nest, probably of this species, was observed attached to the boughs of a tree in one of the shrubberies belonging to C. H. Leigh, Esq. (lord lieutenant of the county), near the entrance into the town. Mr. Leigh had it cut off, with part of the boughs attached, intending to send it to a friend in London. It was pear-shaped, about seven inches in diameter, and eight or nine inches in length. It was packed up before I heard of it, so that I could not procure one of the wasps. The person who informed me of the circumstance brought me a portion of the papyraceous covering of the nest, about four inches long and two wide; in some of the darker streaks there appears a deficiency of the glutinous matter with which the fibres are coated and joined together.—*James Bladon; Pont-y-pool, November* 29, 1842.

Note on Wasps. While I am on the subject of wasps, I may as well remark that they have been more than usually numerous this season about the town. A species about the size of the common wasp has been considerably more numerous than the latter; it has a black mark on each segment with three projecting angles, one of which is central, the lateral ones occupying the places of the distinct lateral dots on the segments of the common wasp.—*Id.*

Zoophytes.

Note on Sertularia. About two years ago I detached two specimens of a Sertularia from an oyster-shell; they were about $1\frac{3}{4}$ inch high, the side branches being from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in length. Having broken off with the Sertularia a piece of the shell to form a base for it to stand upright on, I placed it within the doors of a book-case to keep it from the dust; about two or three months afterwards I took it to a tub of rain water for the purpose of washing off the saline incrustations, and after rinsing it several times I observed the branches begin to assume a more rigid appearance, and the stem, which had previously been lax and drooping, became perfectly upright and rigid. If any part was drawn aside it immediately regained its position, and in this state it remained nearly a day before it began to droop again. I repeated this experiment a few weeks back, with the same result.—*James Bladon.*

Note on the Capture of a Whale at Deptford.



Fin-backed whale, *(Balænoptera boops.)*

On the afternoon of Sunday, the 23rd of October last, a whale was seen slowly floating down the river near Deptford pier. Some of the watermen put off in a boat, and one, armed with a spear, struck the intruder, which caused him instantly to spout up streams of water through his blowers. It however soon became evident that the poor creature was in too exhausted a state either to escape or make any resistance, and a number of other boats gathering round, he was got alongside the pier without much difficulty, and subsequently, by the aid of ropes, hoisted on the platform, where he was received by such a concourse of visitors that the assistance of the police was called in to preserve the peace. On Monday morning the whale was removed to the premises of the Bull and Butcher public-house, and notice of the capture having been sent to the British Museum, Mr. Gray, the principal zoological officer of that establishment, went down to Deptford to examine him. That gentleman, with his accustomed kindness and zeal in diffusing information on every branch of Natural History, has furnished the Editor of 'The Zoologist' with an outline sketch, made by himself on the spot, together with the following description and admeasurements.

The whale was of a blackish lead colour, dorsal fin and lips of the same colour as the back; chin and under parts of the body below the pectoral fins white; there was also a large white spot on each pectoral flapper, occupying nearly half of its upper outer side. The blowers were situated over the eyes; they were linear, rather diverging, and valvular like the nostrils of a seal; each blower was 5½ inches long, and there was a deep groove between them 7 inches long. The

eyes were situated near the angle of the mouth; they were 2½ inches long and wide in proportion, and at each corner of the eye was a groove half an inch in length. The upper jaw was 32 inches long, and the lower one, measured along the curve, 35 inches; the upper jaw was 24 inches wide, and the whalebone 5½ inches deep on the outer side, and 8 inches deep on the inner or deepest part: from the tip of the snout to the posterior extremity of the blowers was 39 inches; thence, measured along the back to a level with the anterior part of the pectoral fin 19 inches; thence to the anterior part of the dorsal fin 58 inches; and thence to the middle of the tail 60 inches, making the entire length 14 feet 8 inches; the body, measured across over the back from one pectoral fin to the other, was 40 inches; the width of each pectoral fin at its base, 11 inches; its length along the anterior edge, 24 inches, along the posterior edge 17 inches; the hinder part of the body near the tail was compressed and sharp-edged above, it was 10½ inches in depth. The tail was 46 inches in width, and the anterior edge of each division 25 inches long. The dorsal fin was cut off during the night after the capture of the animal. The specimen, after passing through several hands, was purchased by the British Museum.*

This whale appears to have been a young specimen of the Balæna Boops of Linneus, the Balænoptera Boops of Fleming, Cuvier, Bell and others; it is identical with the Balænoptera Rorqual and B. gibbar of Lacepède, and with the Balæna rostrata, as published in the 'Philosophical Transactions' for 1787, p. 373, pl. xx: but Mr. Gray remarks that in the Deptford specimen the front of the flapper and the front of the dorsal fin was each one third from the ends of the body; while in Mr. Hunter's figure the middle space of the body between the members is much longer than the distances between them and the ends of the body; still, if the admeasurements be taken from the description there is no discrepancy in the relative proportions of the two. Both Mr. Hunter's and the Deptford specimens were females. It is far from uncommon, and is well known among fishermen and mariners generally by the names of *finner*, *fin-back*, *fin-fish* and *gibbar*.

These finners have continually made their appearance on our coast, and not unfrequently been stranded and captured, but they are not

* After the drawing at the head of this note had been prepared, Mr. Showell, of Park Lodge, New Cross, most kindly brought to the editor a highly finished sketch of the whale, made by Mr. Bate.

sought after by our whalers, being very wild and savage, and if taken, yielding a very small quantity of blubber.

The finner grows to a large size, exceeding a hundred feet in length. The skeleton of a finner, 95 feet in length, was exhibited some years ago at Charing Cross; the cavity of the ribs was fitted up as a kind of sitting-room, with chairs and a table, and was not unfrequently tenanted by a party of merry-makers, who resorted to this unwonted saloon to sip their wine. This whale was stranded at Ostend, and is said to have weighed 249 tons, and to have produced 4000 gallons of oil. K.

Short Communications about Quadrupeds.

Note on the Intelligence of Animals, illustrated by means of two Pointer Dogs.

"M. Leonard read a paper on the intelligence of animals, which he illustrated by means of two pointer dogs which he had trained for the purpose.

"To show that these animals possessed the power of comparison, he placed different objects upon the ground, such as a glove, a roll of paper, a small box, &c., and having kept similar objects himself, he showed them one after another to either of the dogs, and desired the animal to fetch that which was like it from the ground. The dogs performed this task correctly, and all others which they were desired.

"Cards, with numbers from 1 to 9 painted upon them, were placed upon the ground, and the dogs fetched any particular number they were bidden: a number brought, M. Leonard ordered the dog to take back again and exchange for another number, and at the same time to deposit it in the place of that number. The dogs also selected a card of a particular colour, when desired, from among many of different colours. Pieces of bread were placed on the ground, and in placing them, their master called them by the names of different numbers in an irregular manner, and afterwards ordered the dogs to fetch the piece of bread he had called a certain number.—These and various other experiments (some with pieces of meat) were all performed correctly, and tended to show the great intelligence of the animals, and the control which their master had obtained over them.

"The dogs were named Phylax and Braque, and either dog, upon his name being called, performed the task he was ordered; but one of them appeared to be more quick than the other."—Proceedings of Zoological Society, 1841, p. 47.

Anecdote of a Bat flying by day-light. Seeing Mr. Douglas's note respecting the diurnal flight of the bat (Zool. 6), I send you the following note on the same subject. On the 11th of November last, at half-past 3 o'clock, in the wide part of the Boro' (Southwark), near the Town Hall, I saw a bat of the smaller species on the wing. I watched it for the best part of an hour, and left it performing its gyrations, which were, while I witnessed them, confined to about forty

yards up and down the street. From its motions it appeared to be catching insects, its flight agreeing exactly with that of the swallow when so engaged. Several vehicle-drivers tried to cut it down, but it wheeled and dodged about, and nimbly avoided their attempts to strike it. The afternoon was clear, but the sun did not shine. It is probable that this night-harbinger came up with some of the hop-waggons which usually stop at the spot; be this as it may, its dancing amused me and a host of wonderers besides.—*Alfred Lambert; 6, Trinity St. December* 3, 1842.

Note on a Weasel. One day in June, 1842, as a lady was sitting in a room at Ilford, the windows of which opened to the ground, she was very much surprised by the appearance of a weasel (Mustela vulgaris), which, after trying round the window for an entrance, stood up on its hind legs against one of the panes of glass, and remained there, notwithstanding the furious barking of a little terrier that was in the room, until the window was opened, when he started off very leisurely, but was overtaken and killed by the dog.—*W. T., London, December*, 1842. [In future, all communications, unless editorial, must have the writer's name and address.—*Ed.*]

Note on the capture of the Sea Eagle (Haliaëtos albicilla) *in Shetland.* By Thomas Edmonston, jun. Esq.

In these days the respective monarchs of the quadruped and bird kingdoms—the lion and the eagle, are not invested with the shadowy mantle of *super-animal* bravery and magnanimity with which the older naturalists, as well as poets, loved to clothe them. On the contrary, the courage of the African king of the desert has been more than once daringly and distinctly impugned; and even the eagle, whom we find gravely described in works of no very ancient date, as of much too noble a nature to fear even the "human form divine," and having far too much respect for his dignity (or his stomach) to touch food which had not been slaughtered by his own royal self, he is sunk into a place but little higher than the vultures—with whom in fact the great and discerning mind of the first of naturalists, Linnæus, associated him, and certainly with as much justice as some more modern systematists, who have classed him with the falcons—and found not only to be glad to partake of a carrion banquet with the raven and the hoody, but also to be endowed with no more of the faculty of courage, when pitted against his equals or superiors, than those who regard discretion as the better part of valour.

The following incident may not be uninteresting as placing in a striking point of view the deficiency of courage displayed by this species, when placed in opposition to the "majesty of man," even in its own peculiar haunts.

The sea eagle or erne is the only species, so far as I know, that breeds in these islands. The golden eagle and osprey are occasionally seen, but seem entitled to no higher rank than that of stragglers. The erne itself is scarce, and from its breeding in the highest cliffs is very seldom procured from the nest, while its extreme wariness makes the shooting of it no easy matter. The Shetland cragsmen are probably among the most daring in the world; for unlike those of St. Kilda, Faro, &c. who scale the precipices by the regularly organized assistance of their companions, and with ropes and poles, the Shetlander fearlessly scrambles through the dizzy cliffs alone, and without other aid than is afforded him by the precarious holds he gets with his feet and hands: when we consider this is frequently in the most mouldering micaceous precipices, where the giving way of the fragment the venturous climber may be trusting to, would precipitate him some hundred feet on the rocks or into the ocean below, and when he has often a bag of young birds or eggs attached to his body, we may well say, as Shakspeare does of the samphire-gathering on the cliffs of Dover—"dreadful trade!"

To return to the erne. For some years back a very expert and daring fowler, Joseph Mathewson by name, had been in the habit of annually robbing the nest of a pair of ernes,* which had, from time immemorial, built on a ledge of rock perhaps 400 feet above the level of the sea, on the north-west side of the island of Unst. This year he had as usual ascended the cliff for that purpose, but finding only two eggs (the erne always laying *three*, of which one is barren), which he took, he returned after a few days to get the other, supposing it to be then deposited. The eyrie was built on a tolerably broad ledge of rock, and on coming up to one end of it, the nest being concealed from him by an outstanding piece of rock, he was aware of the bird being in it, by seeing its white tail projecting beyond the interposing

* I may mention a curious circumstance which happened to him two or three years ago, with the same pair of birds. On getting to the eyrie he found two young ones in it, but thinking them too young to remove, he only took the odd egg always found, intending to return in a few days for the young, which he did, but found that the old birds had removed both nest and young to a considerable distance from the first place, and on the other side of a deep creek or "gyo" as it is vernacularly termed, and there it has remained ever since.

stone. He crept cautiously along the shelf till close to the erne, and then suddenly raising himself, and throwing his body over the stone, seized the bird by a wing and leg. The so-called king (or in this instance *queen*) of the feathered tribes, seemed completely cowed by his presence, and made no resistance to this rude and unexpected interruption, on the contrary, she merely opened her bill, apparently in a furtive attempt to call in the assistance of her lord and master, who, by the way, was soaring at a safe distance above, while this lawless "spulzie" was perpetrating, and then resigned herself to her fate. The non-resistance of the bird was the more singular, as one of her wings and feet, and her head, were entirely free, and the powerful struggle she *could* have made would have either soon freed herself, or, what is more probable, dragged the spoiler over the precipice. To use his own simile, she made no more resistance than had it been a hen or a goose in similar circumstances. He, however, seeing her thus passive, leisurely undid his garters, tied up the bill and feet, twisted the wings together, and the vulture-eagle lay in her own nest, bound, gagged and powerless. The only path by which the man could return was too steep and difficult to allow of his carrying such a heavy bird, and consequently he was obliged to let her fall, and the unfortunate captive rolled down helpless through the air she had so often cloven with such ease and safety, and met an ignominious death on the rocks beneath. The successful fowler retraced his steps by another and a safer path, and secured his prize, which, with the egg obtained at the same time, is now before me, being in the possession of my uncle, Thomas Edmonston, Esq. of Burress. The nest was constructed chiefly of heather twigs and the dried stems of Laminaria digitata, uprooted and cast ashore; it was lined with wool, feathers and "*sinna*,"* and contained few of the remains usually found in the nests of birds of prey, as the young ones had not come out, but a dead guillemot and two kittiwakes were found, which renders it probable that one bird feeds the other while sitting on the eggs. It is also asserted that the male regularly takes his turn at the duty of incubation. The stomach contained, among some nearly digested fragments, an entire puffin.

The following description of this individual, a very old female, in perfect summer plumage, may perhaps be interesting to some of your

* This name is applied to the withered herbage of the previous year; and in Norway and Iceland it is given to Carex sylvatica, which plant, with the Fescues, Luzula maxima &c. chiefly compose the grass of the cliffs in Shetland.

readers. Bill one-third shorter than the head, brownish yellow; cere yellow: nostrils oblique, oblong. Head and neck greyish ferruginous, feathers lanceolate acuminate, a few below the lower mandible linear acuminate; anterior and medial dorsal feathers ovate, abrupt, ferruginous, the margins lighter; posterior dorsal feathers dark chocolate brown, with a narrow lighter border, abrupt and shortly acuminate; tail coverts dark brown, lanceolate-ovate: tail-feathers twelve, somewhat cuneiform, yellowish-white: upper or dorsal alar feathers ovate, abrupt, dark brown, secondaries greyish chocolate, abrupt; quills thirty-six, dark brown: lower wing-coverts dark brown, abrupt, acuminate; lower alar feathers roundish lanceolate, light ferruginous: pectoral feathers lanceolate, greyish ferruginous: abdominal, hypochondrial and tibial feathers dark grey; upper abdominal bordered with ferruginous, ovate, those on the tibia lanceolate, abrupt: feet gamboge yellow, claws black. Scutella of the leg, 9; of middle toe, 16; of each of the side toes and hind toe, 6.

MEASUREMENT.

	INCHES.		INCHES.
Point of bill to end of tail,	39	Lore,	$1\frac{1}{10}$
Utmost extent of wing,	93	Cere at the dorsum of bill,	$\frac{8}{10}$
Length of do. when closed	$26\frac{1}{2}$	Gape,	$3\frac{7}{10}$
Point of bill to base of cere	$2\frac{1}{2}$	Nostrils,	$\frac{9}{20}$
Base of cere to back of head	$2\frac{2}{3}$		

THOS. EDMONSTON, JUN.

Baltasound, December, 1842.

Short Communications about Birds.

Note on the Crossbill, (Loxia curvirostra). These birds were very plentiful in the south of Devon during the winter of 1838-9; and on the 10th of April, 1839, I saw a nest at Ogwell House, near Newton; it was built in a spruce fir tree, close to the stable, and appeared to be constructed in a somewhat similar manner to that of the greenfinch (Coccothraustes Chloris). The male had been shot, but the female still continued to attend the nest.—*W. R. Hall Jordan; Teignmouth, November* 24, 1842.

Note on Birds shot at Southend. The following birds were obtained by myself and a friend in the neighbourhood of Southend, Essex, during the last week of August and the two first of September.

Ring Plover, *Charadrius Hiaticula*
Grey Plover, *Squatarola cinerea*
Lapwing or Peewit, *Vanellus cristatus*
Oyster-catcher, *Hæmatopus Ostralegus*
Common Heron, *Ardea cinerea*
Curlew, *Numenius arquata*
Common Snipe, *Scolopax Gallinago*
Black-tailed Godwit, *Limosa melanura*

Knot, *Tringa Canutus*
*Pigmy Curlew, *Tringa subarquata*
Dunlin or Oxbird, *Tringa alpina*
*Least Sandpiper or Stint, *Tringa minuta*
*Sanderling, *Arenaria calidris*
*Red-necked Phalarope, *Lobipes hyperborea*
Turnstone, *Strepsilas interpres*
Redshank, *Totanus calidris*
Green Sandpiper, *Totanus ocropus*
Common Sandpiper, *Totanus hypoleucos*
*Coot, *Fulica atra*
*Red-throated Diver, *Colymbus septentrionalis.* In adult plumage
*Arctic Skua, young, *Lestris parasiticus?*
Common Gull, *Larus canus*
*Lesser black-backed Gull, *Larus fuscus*
*Herring Gull, *Larus argentatus*
*Masked Gull, *Chroicocephalus capistratus.* One specimen of this rare bird in company with a small flock of the common Tern; now alive, and in my possession
Hooded Gull, *Chroicocephalus ridibundus*
Sandwich Tern, *Sterna Cantiaca*
Common Tern, *Sterna marina*
Lesser Tern, *Sterna minuta*
*Widgeon, *Mareca Penelope*, 1 specimen only

I have named the birds from Eyton's Catalogue; of those marked with a * I have only one or two specimens, the rest were all common. —*Fred. Bond; Kingsbury, Middlesex, December*, 1842.

Note on the Red-backed Shrike, (Lanius Collurio). Mr. Selby mentions having seen a hedge-accentor impaled on a thorn by the great ash-coloured shrike (L. Excubitor); and several foreign species of shrike have been observed in the act of seizing their prey: but I am not aware that L. Collurio has been seen doing this, although large insects, which appear to be its usual food, have been frequently found impaled. It is not uncommon in Devonshire and other southern counties, and I once found on the cliffs at Teignmouth (a place frequented by the bird), a tiger moth (Eyprepia villica) and several large flies (Eristalis) stuck on thorns. — *W. R. Hall Jordan; Teignmouth, November* 12, 1842.

Note on the Grey Shrike, (Lanius Excubitor). An individual of this species, which I had in confinement for a long time, invariably hung its food round the cage; if half a dozen birds were put in, it hung them all up by forcing their heads between the wires of the cage, and pieces of meat were also fastened up. I never saw the red-backed shrike impale insects, nor do I recollect ever to have found any impaled here, although the bird is not at all uncommon. — *Henry Doubleday; Epping, December*, 1843.

Note on the Hawfinch, (Coccothraustes vulgaris). This bird, although pretty common in some localities, seems very partially distributed in England, and there is something a little remarkable in its habits. In the winter of 1835 and spring of 1836, they were extremely common in the forest, associating in large flocks, and feeding upon the seeds of the hornbeam, which were very abundant. In the spring of 1837 I saw fewer birds, and the seed was not abundant, I mean the

crop of 1836. The springs of 1837, 1838, 1839 and 1840 were cold and frosty when the hornbeam was in flower, and I believe not a seed was to be seen through the whole forest; during this time I scarcely saw any hawfinches, only a single bird now and then in gardens &c. The spring of 1841 was fine and warm, and there was an immense quantity of seed upon the hornbeams in the summer; as I expected, during the autumn of that year and the spring of 1842, hundreds of hawfinches were to be seen wherever there was seed, and I saw many nests in the summer. Now again there is little or no seed, and not a hawfinch is to be met with in the forest, and I have seen only one or two solitary individuals during the winter. What becomes of them all? Do they disperse over the country, or do they leave us altogether? They will feed on the kernels of haws, yew-berries, laurel and plum-stones, &c., but decidedly prefer the seed of the hornbeam to anything else; in the summer they are very destructive to green peas. They become very tame in confinement, though extremely wild in a state of nature.—*Id.*

Note on Birds in February.—

"On the 1st of the month partridge and pheasant-shooting end. At the end, wagtails and stonechats have usually assumed their summer or nuptial plumage, and the stock-dove frequently has young: about this time, if the weather is mild, pied wagtails stonechats and wood-larks, which had either left the country or retired to the coasts, return inland and disperse themselves in pairs over the country."— *Van Voorst's Naturalists' Almanack, for* 1843.*

Short Communication about Reptiles.

Note on the occurrence of Alligators in East Florida. Alligators are not very rare in East Florida. When I first took up my abode abode on the St. John's I never saw them, and began to imagine there were none; but in about two months' time, that is, early in March, they crept out from their winter abodes, looking pale and soddened, and one fine day I found three big fellows in the marshes close to the house, within a very short distance of each other. As the spring advanced I saw them much more often, and frequently have watched them floating like huge pine-logs down the river, their crested backs however easily distinguishing them when within a moderate distance. When first I reached Jacksonville I was very much puzzled to make

* This unpretending little almanack contains a diary of the scientific meetings, as far as relates to Natural History; a naturalists' calendar; a succinct account of the London scientific societies, &c., together with the usual almanack information.

out what a quantity of spongy-looking but hard substances strewed along the shore could possibly be. They were extremely numerous in a little bend of the river, just below the town. I found out that they were the dermal bones of alligators, which had either died of a good old age—"exactis non infelicitèr annis"—or had fallen victims to the rifles of the militia and troops constantly passing up and down the river in the steamers; with these fellows a floating alligator being a favourite mark. This slaughter must have very much thinned them, in fact Black Creek, formerly the metropolis of alligators north of Lake George, when I visited it, was nearly as free from them as from Indians, though only a few years before, its shores might probably have boasted the biggest specimens of both species to be found in Florida. I must just add in conclusion my opinion that the alligator has been very ill used by the reports of travellers, and that far from being a ferocious beast, where man is concerned, he is mighty civil, generally dropping quietly into the water at the sight of human beings, to avoid alarming them by his ugly visage and gigantic carcass; or it may be from having learned by experience that in Florida the crack of a rifle is no rare accompaniment to the splash of an oar.—*Edward Doubleday;* 10, *Newington Crescent*, *October* 14, 1842.

Notice of 'The Old Red Sandstone.' *

"Few facts are more remarkable in the history of the progress of human discovery than that it should have been reserved almost entirely for the researches of the present generation to arrive at any certain knowledge of the existence of the numerous extinct races of animals, which occupied the surface of our planet in ages preceding the creation of man."—Buckland's Bridgwater Treatise, i. 108.

Dr. Buckland, addressing the British Association, said that he had never been so much astonished by the powers of any man, as when perusing the geological descriptions of Mr. Miller, as published in the Witness newspaper: that wonderful man described these objects with a felicity which made the Doctor ashamed of the comparative meagerness and poverty of his own descriptions: he would give his left hand to possess such powers of description. Mr. Murchison also remarked that he had seen some of Mr. Miller's papers on Geology, written in a style so beautiful and poetical, as to throw plain geologists like himself into the shade. Praise from such men precludes

* *The Old Red Sandstone; or New Walks in an Old Field.* By Hugh Miller. Edinburgh: John Johnstone. London: R. Groombridge. 1842. (2nd edition).

the necessity of any editorial comments on the style and manner of the volume in question, yet leaves untouched the more pleasing task of investigating its contents.

It should perhaps be stated that about one third of the work consists of a series of sketches, written for, and originally published in, 'The Witness' newspaper; these sketches have expanded into a volume of 300 pages, and the reading public has abundant cause to be gratified with the expansion. Mr. Miller commences his task with some advice to working men, showing them what is their true policy, and recommending them to abstain from chartist meetings, and make a right use of their eyes :—"the commonest things are worth looking at—even stones, and weeds, and the most familiar animals": he then relates how, when "a slim loose-jointed boy," he set out a little before sunrise, to make his first acquaintance with a life of labour in one of its most disagreeable forms—to work in a quarry. In this occupation his interest was greatly excited by the appearance of a platform of rock laid bare by the power of gunpowder: "the entire surface was ridged and furrowed like a bank of sand that had been left by the tide an hour before." He "could trace every bend and curvature, every cross hollow and counter-ridge of the corresponding phenomena; for the resemblance was no half resemblance, it was the thing itself." Fresh causes of wonder and admiration continued to break on the mind of the young quarry-man, until he found that the life of labour was not without its sweets: but when, a few days afterwards, he was removed to another quarry, "in a lofty wall of cliffs that overhang the north shore of the Moray Frith," when in the course of the first day's employment he picked up a nodular mass of blue limestone, and laid it open by a stroke of his hammer, the blow revealing to his delighted and astonished eye "a beautifully finished piece of sculpture — one of the volutes, apparently, of an Ionic capital,"—then he became a geologist, his fate was sealed, the foundation of his fame was laid, for with that discovery there seemed to rise within him a desire for knowledge only to be increased as knowledge was attained.

Time passed on, and Mr. Miller became a scientific geologist; we soon find him emerging from the infantile wonderer at a beautiful fossil, and writing, in the learned phraseology of a professor, of "an enormous deposit of dark-coloured bituminous schist, slightly micaceous, calcareous, or semi-calcareous—here and there interlaced with veins of carbonate of lime—here and there compact and highly siliceous, &c."—writing, in fact, like the veriest sages of the science: but let us turn from scientific disquisitions on strata to the more interesting no-

tice of the treasures they contain; — let us examine their Zoology. Prior to the exertions of Mr. Miller, the old red sandstone was considered a poor field for the palæontologist: one author in particular has asserted that "the old red sandstone has hitherto been considered as remarkably barren in fossils;" — let us hear Mr. Miller's opinion in reply.

"My first statement regarding it must be much the reverse of the borrowed one with which this chapter begins. *The fossils are remarkably numerous, and in a state of high preservation.* I have a hundred solid proofs by which to establish the truth of the assertion, within less than a yard of me. Half my closet walls are covered with the peculiar fossils of the Lower Old Red Sandstone; and certainly a stranger assemblage of forms have rarely been grouped together; — creatures whose very type is lost, — fantastic and uncouth, and which puzzle the naturalist to assign them even their class; — boat-like animals, furnished with oars and a rudder; — fish plated over, like the tortoise, above and below, with a strong armour of bone, and furnished with but one solitary rudder-like fin; — other fish, less equivocal in their form, but with the membranes of their fins thickly covered with scales; — creatures bristling over with thorns; others glistening in an enamelled coat, as if beautifully japanned, — the tail, in every instance among the less equivocal shapes, formed not equally, as in existing fish, on each side the central vertebral bone, but chiefly on the lower side, — the bone sending out its diminished vertebræ to the extreme termination of the fin. All the forms testify of a remote antiquity, — of a period whose "fashions have passed away." The figures on a Chinese vase or an Egyptian obelisk are scarce more unlike what now exists in nature, than the fossils of the Lower Old Red Sandstone."—p. 57.

From this we pass on to the Lamarckian hypothesis of progressive development. Mr. Miller's arguments on this subject are full of wit and point, yet, except as affording him an opportunity of exhibiting his powers, they must be considered as rather amusing than instructive, for in this age of enquiry there are no Lamarckians: the hypothesis is a non-entity, — a spirit known only to those by whom it is conjured up for the express purpose of being submitted to a formal exorcism: each author who mentions it is himself its creator: like the Pope or Guy Fawkes of the 5th of November, it is a being of straw invested with imaginary terrors for the purpose of enhancing the pleasure and the merit of its total annihilation. However, Mr. Miller shall speak for himself.

"Mr. Lyell's brilliant and popular work, 'The Principles of Geology,' must have introduced to the knowledge of most of my readers the strange theories of Lamarck. The ingenious foreigner, on the strength of a few striking facts, which prove that, to a certain extent, the instincts of species may be improved and heightened, and their forms changed from a lower to a higher degree of adaptation to their circumstances, has concluded that there is a natural progress from the inferior orders of beings towards the superior; and that the offspring of creatures low in the scale in the present time, may

hold a much higher place in it, and belong to different and nobler species, a few thousand years hence. The descendants of the *ourang-outang*, for instance, may be employed in some future age in writing treatises on Geology, in which they shall have to describe the remains of the *quadrumana* as belonging to an extinct order. Lamarck himself, when bearing home in triumph with him the skeleton of some huge salamander or crocodile of the Lias, might indulge, consistently with his theory, in the pleasing belief that he had possessed himself of the bones of his grandfather,—a grandfather removed, of course, to a remote degree of consanguinity, by the intervention of a few hundred thousand *great-greats*."—p. 62.

A little further on we have the following dainty extract from Maillet's 'Teliamed.'

"Winged or flying fish, stimulated by the desire of prey, or the fear of death, or pushed near the shore by the billows, have fallen among reeds or herbage, whence it was not possible for them to resume their flight to the sea, by means of which they had contracted their first facility of flying. Then their fins, being no longer bathed in the sea-water, were split and became warped by their dryness. While they found, among the reeds and herbage among which they fell, any aliments to support them, the vessels of their fins being separated, were lengthened and clothed with beards, or, to speak more justly, the membranes which before kept them adherent to each other, were metamorphosed. The beard formed of these warped membranes was lengthened. The skin of these animals was insensibly covered with a down of the same colour with the skin, and this down gradually increased. The little wings they had under their belly, and which, like their wings, helped them to walk in the sea, became feet, and served them to walk on land. There were also other small changes in their figure. The beak and neck of some were lengthened, and those of others shortened. The conformity, however, of the first figure subsists in the whole, and it will be always easy to know it. Examine all the species of fowls, large and small, even those of the Indies, those which are tufted or not, those whose feathers are reversed, such as we see at Damietta, that is to so say, whose plumage runs from the tail to the head, and you will find species quite similar, scaly or without scales. All species of parrots, whose plumages are so different, the rarest and the most singular-marked birds, are, conformable to fact, painted like them with black, brown, grey, yellow, green, red, violet-colour, and those of gold and azure; and all this precisely in the same parts where the plumages of those birds are diversified in so curious a manner." (Teliamed, p. 224, Ed. 1750.—p. 65.

Mr. Miller justly observes that Geology abounds with those intermediate forms which naturalists have usually termed "connecting links," or, as he expresses it, links "which, as as it were, marry together dissimilar races," but which furnish no evidence that one race derived its lineage from another. We pass from one type of form to another, through successive geological formations, but we never find, as in the 'Winter's Tale,' that the grown-up sheperdess of one scene is identical with the exposed infant of the scene that went before. — Fish rank the lowest among vertebrate animals, and in geological history appear the first. It is a geological fact, that fish of the highest

orders appeared first on the stage, and not the lower or worm-like fishes; so our author argues that the transition to reptiles was not by gradual progress, as the Lamarckian hypothesis would have it, for the higher or cartilaginous fishes were predominant during the enormous period represented by the five successive formations which preceded the commencement of the age of reptiles.

The subject concludes thus: —

"Geoffrey Hudson was a very short man, and Goliath of Gath a very tall one, and the gradations of the human stature lie between. But gradation is not progress; and though we find full-grown men of five feet, five feet six inches, six feet, and six feet and a half, the fact gives us no earnest whatever that the race is rising in stature, and that at some future period the average height of the human family will be somewhat between ten and eleven feet. And equally unsolid is the argument that from a principle of gradation in races would deduce a principle of progress in races. The tall man of six feet need entertain quite as little hope of rising into eleven feet, as the short man of five; nor has the fish that occasionally flies any better chance of passing into a bird, than the fish that only swims."—p. 66.

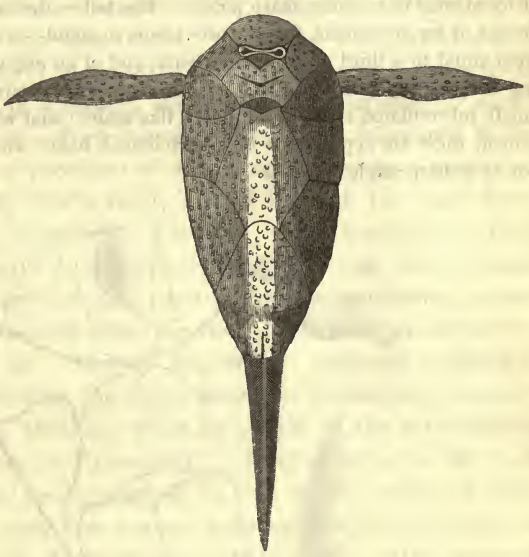
In proceeding to those discoveries for which we are peculiarly indebted to Mr. Miller, the Pterichthys, or winged fish, comes first in order, and is certainly the most interesting. In the system of Nature this strange creature would appear to be a cartilaginous fish, encased in the shell of an Echinus, the very tubercles of the shell bearing out the resemblance, and looking as though they had once served for the attachment of some armature analogous to that of the urchins. This idea seems strengthened by the opinion of Agassiz, who considers the wings of Pterichthys as weapons of defence only, like the occipital spines of the river bull-head; and capable of instantaneous erection on occasions of danger, but otherwise lying close by the creature's side. "The river bull-head, when attacked by an enemy, erects its spines at nearly right angles with the plates on its head, as if to render itself as difficult of being swallowed as possible." A first glance at the strong and seemingly sinewy arms of the Pterichthys would induce the belief that it moved with extreme velocity through the abyss of waters, but when stripped of this supposed activity by assigning another purpose to the arms, we have little more than a modified Echinus, and may suppose it invested with a similar ornamental panoply.

"Of all the organisms of the system, one of the most extraordinary, and in which Lamarck would have most delighted, is the *Pterichthys*, or winged fish, an ichthyolite which the writer had the pleasure of introducing to the acquaintance of geologists nearly three years ago, but which he first laid open to the light about seven years earlier. Had Lamarck been the discoverer, he would unquestionably have held that he had caught a fish almost in the act of wishing itself into a bird. There are wings

which want only feathers, a body which seems to have been as well adapted for passing through the air as the water, and a tail by which to steer. And yet there are none of the fossils of the Old Red Sandstone which less resemble anything that now exists than its *Pterichthys*. I fain wish I could communicate to the reader the feeling with which I contemplated my first-found specimen. It opened with a single blow of the hammer; and there, on a ground of light-coloured limestone, lay the effigy of a creature fashioned apparently out of jet, with a body covered with plates, two powerful-looking arms articulated at the shoulders, a head as entirely lost in the trunk as that of the ray or the sun-fish, and a long angular tail."—p. 70.

* * * * *

"Imagine the figure of a man rudely drawn in black on a grey ground, the head cut off by the shoulders, the arms spread at full, as in the attitude of swimming, the body rather long than otherwise, and narrowing from the chest downwards, one of the legs cut away at the hip joint, and the other, as if to preserve the balance, placed directly under the centre of the figure, which it seems to support. Such, at a first glance, is the appearance of the fossil. The body was of very considerable depth, perhaps little less deep proportionally



Pterichthys or winged fish.

from back to breast than the body of the tortoise; the under part was flat, the upper rose towards the centre into a roof-like ridge, and both under and upper were covered with a strong armour of bony plates, which, resembling more the plates of the tortoise than those of the crustacean, received their accessions of growth at the edges or sutures. The plates on the under side are divided by two lines of suture, which run, the one longitudinally through the centre of the body, the other transversely, also through the centre of it; and they would cut one another at right angles, were there not a lozenge-shaped plate inserted at the point where they would otherwise meet. — There are thus five plates on the lower or belly part of the animal. They are all thickly tuberculated outside with wart-like prominences; the inner present appearances indicative of a bony structure. The plates on the upper side are more numerous and more difficult to describe, just as it would be difficult to describe the forms of the various stones which compose the ribbed and pointed roof of a Gothic cathedral, the arched ridge or hump of the back requiring, in a somewhat similar way, a peculiar form and arrangement of plates. The apex of the ridge is covered by a strong hexagonal plate, fitted upon it like a cap or helmet, and which nearly corresponds in place to the flat central part of the under side. There runs around it a border of variously-

formed plates, that diminish in size and increase in number towards the head, and which are separated like the pieces of a dissected map, by deep sutures. They all present the tuberculated surface. The eyes are placed in front, on a prominence much lower than the roof-like ridge of the back; the mouth seems to have opened, as in many fishes, in the edge of the creature's snout, where a line running along the back would bisect a line running along the belly, but this part is less perfectly shown by my specimens than any other. The two arms or paddles are placed so far forward as to give the body a disproportionate and decapitated appearance. From the shoulder to the elbow, if I may employ the terms, there is a swelling muscular appearance, as in the human arm; the part below is flattened so as to resemble the blade of an oar, and it terminates in a strong sharp point. The tail — the one leg on which, as exhibited in one of my specimens, the creature seems to stand—is of considerable length, more than equal to a third of the entire figure, and of an angular form, the base representing the part attached to the body, and the apex its termination. It was covered with small tuberculated rhomboidal plates like scales; and where the internal structure is shown, there are appearances of a vertebrated bone, with rib-like processes standing out at a sharp angle."—p. 73.

a. Coccosteus cuspidatus. *b.* Part of its tail. *c.* An abdominal lozenge-shaped plate of the same fish.

Closely allied to Pterichthys is the genus Coccosteus; "both were

covered with armour of thickly tuberculated bony plates, and both furnished with a vertebrated tail." Our author compares Coccosteus to a boy's kite, a simile which, from the figure,* appears sufficiently apt. The arms are much more like fins or paddles than those of Pterichthys; and indeed, exhibiting as they do an approach to the normal form of a fish's fin, rather militate against the hypothesis already noticed as suggested by Agassiz, that these organs in Pterichthys were merely weapons of defence. The author, as well as many other geologists, lays great stress on the similarity in outline between these anomalous fishes and the extinct trilobites, thus hypothetically connecting the fishes with the Crustacea. It is not the province of a notice like this to enter on so abstruse a question, but the premises on which the hypothesis is founded, seem scarcely available in such a cause. Let it be first solved whether a trilobite belonged to the mollusk or crustaceous province of the animal kingdom,—whether it crawled on its belly like a snail, darted through the water like a shrimp, or ran on dry ground like a spider. After ascertaining these particulars, let us attempt a comparison between it and other animals by characters less superficial than mere outline or appearance, something a little more structural than the resemblance of an orchis to a bee or a mantis to a leaf. Indeed Mr. Miller, although yielding to the idea of thus connecting the fishes with the Crustacea, evinces a much sounder mode of thinking when he speaks of the resemblance, even when more striking, as "*pictorial*." After speaking of the body of the trilobite as being *really* jointed, he tells us the body of Cephalaspis was barred by transverse scales, between which there were no joints, and concludes his observations in these words. "It is interesting to observe how nature, in thus bringing two such different classes as fishes and Crustacea together, gives to the higher animal a sort of pictorial resemblance to the lower, in parts where the construction could not be identical without interfering with the grand distinctions of the classes."—p. 79.

We are next introduced to fishes whose figure is somewhat more in accordance with our notions of what a fish ought to be, yet differing most essentially in some structural peculiarities. The readers of the Zoologist must be well acquainted with the common sturgeon, and must have observed the manner in which its head and sides are defended with osseous plates: the same character is still more observ-

* In our copy of the figure a portion of the tail has been drawn detached from the body, in order to save the space which so long a block would have required.

able in the genus Lepisosteus* of Lacepède, the bony pikes, five of which inhabit the rivers of America. The Osteolepis or bony-scale fish, and other fishes of the old red sandstone, seem to carry this extraordinary character to a greater extreme.

"We are accustomed to see vertebrated animals with the bone uncovered in one part only,—that part the teeth,—and with the rest of the skeleton wrapped up in flesh and skin. Among the reptiles we find a few exceptions; but a creature with a skull as naked as its teeth, — the bone being merely covered, as in these, by a hard shining enamel, and with toes also of bare enamelled bone, would be deemed an anomaly in creation. And yet such was the condition of the *Osteolepis*, and many of its cotemporaries. The enamelled teeth were placed in jaws which presented outside a surface as naked and as finely enamelled as their own. The entire head was covered with enamelled osseous plates, furnished inside like other bones, as shown by their cellular construction, with their nourishing blood-vessels, and perhaps their oil, and which rested apparently on the cartilaginous box, which must have enclosed the brain, and connected it with the vertebral column. I cannot better illustrate the peculiar condition of the fins of this ichthyolite, than by the webbed foot of a water-fowl. The web or membrane in all the aquatic birds with which we are acquainted, not only connects, but also covers the toes. The web or membrane in the fins of existing fishes accomplishes a similar purpose; it both connects and covers the supporting bones or rays.—Imagine, however, a webbed foot in which the toes—connected but not covered—present, as in skeletons, an upper and under surface of naked bone; and a very correct idea may be formed from such a foot, of the condition of fin which obtained among at least one half the ichthyolites of the Lower Old Red Sandstone. The supporting bones or rays seem to have been connected laterally by the membrane; but on both sides they presented bony and finely-enamelled surfaces. In this singular class of fish, all was bone without, and all was cartilage within; and the bone in every instance, whether in the form of jaws or of plates, of scales or of rays, presented an external surface of enamel."—p. 99.

"The *Osteolepis* was cased, I have said, from head to tail, in complete armour.—The head had its plaited mail, the body its scaly mail, the fins their mail of parallel and jointed bars; the entire suit glittered with enamel; and every plate, bar and scale was dotted with microscopic points. Every ray had its double or treble punctulated row, every scale or plate its punctulated group; the markings lie as thickly in proportion to the fields they cover, as the circular perforations in a lace veil; and the effect, viewed through the glass, is one of lightness and beauty. In the *Cheirolepis* an entirely different style obtains. The enamelled scales and plates glitter with minute ridges, that show like thorns in a December morning varnished with ice. Every ray of the fins presents its serrated edge, every occipital plate and bone its sculptured prominences, every scale its bunch of prickle-like ridges. A more rustic style characterized the *Glyptolepis*. The enamel of the scales and plates is less bright; the sculpturings are executed on a larger scale, and more rudely finished. The relieved ridges, waved enough to give them a pendulous appearance, drop adown the head and body. The rays of the fins, of great length, present also a pendulous appearance. The bones and

* The name is altered to Lepidosteus by Agassiz: the genus Polypterus of Agassiz found in the Nile and Senegal, has similar characters.

scales seem disproportionately large. There is a general rudeness in the finish of the creature, if I may so speak, that reminds one of the tatooings of a savage, or the corresponding style of art in which he ornaments the handle of his stone-hatchet or his war-club. In the *Cheiracanthus*, on the contrary, there is much of a minute and cabinet-like elegance. The silvery smoothness of the fins, dotted with scarcely visible scales, harmonized with a similar appearance of head; a style of sculpture resembling the parallel etchings of the line engraver fretted the scales; the fins were small, and the contour elegant. I have already described the appearance of the unnamed fossils, —the seeming shell-work that covered the sides of the one, — its mast-like spines and sail-like fins; and the Gothic-like peculiarities that characterized the other, — its rodded, obelisk-like spires, and the external frame-work of bone that stretched along its pectorals."—p. 121.

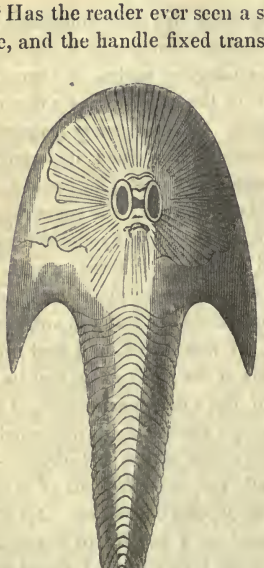
What can be more delightful than the feelings of a man who unassisted has worked out wonders like these! How enviable must be the sensations he experienced when these treasures were first revealed to his uninstructed eyes! Perhaps the volume contains nothing more beautiful than the account of some of his expeditions of discovery: take, for instance, that to the Southern Sutor, between the Moray and Cromarty Friths; the details of the geological features of the scene are fraught with interest even to the general reader, but this is increased tenfold when he arrays before us the result of his labours.

"I set myself carefully to examine. The first nodule I laid open contained a bituminous-looking mass, in which I could trace a few pointed bones and a few minute scales. The next abounded in rhomboidal and finely-enamelled scales, of a much larger size and more distinct character. I wrought on with the eagerness of a discoverer entering for the first time in a *terra incognita* of wonders. Almost every fragment of clay, every splinter of sandstone, every lime-stone nodule, contained its organism. Scales, spines, plates, bones, entire fish; but not one organism of the Lias could I find, —no ammonites, no belemnites, no gryphites, no shells of any kind; the vegetable impressions were entirely different; and not a single scale, plate, or ichthyodorulite could I identify with those of the newer formation. I had got into a different world, and among the remains of a different creation; but where was its proper place in the scale? The beds of the little bay are encircled by thick accumulations of diluvium and debris, nor could I trace their relation to a single known rock. I was struck, as I well might, by the utter strangeness of the forms,—the oar-like arms of the *Pterichthys* and its tortoise-like plates, — the strange buckler-looking head of the *Coccosteus*, which, I suppose, might possibly be the back of a small tortoise, though the tubercles reminded me rather of the skin of the shark,—the polished scales and plates of the *Osteolepis*,—the spined and scaled fins of the *Cheiracanthus*, — above all, the one-sided tail of at least eight out of the ten or twelve varieties of fossil which the deposit contained. All together excited and astonished me. But some time elapsed ere I learned to distinguish the nicer generic differences of the various organisms of the formation. I found fragments of the *Pterichthys* on this morning; but I date its discovery in relation to the mind of the discoverer, more than a twelvemonth later. I confounded the *Cheiracanthus*, too, with its single-spined and membranous dorsal, with one of the still unnamed fossils, furnished with two such dorsals; and the *Diplopterus* with the *Osteolepis*. Still,

however, I saw enough to exhilirate and interest; I wrought on till the advancing tide came splashing over the nodules, and a powerful August sun had risen towards the middle sky; and were I to sum up all my happier hours, the hour would not be forgotten in which I sat down on a rounded boulder of granite, by the edge of the sea, when the last bed was covered, and spread out on the beach before me the spoils of the morning."—p. 139.

Although our readers may perhaps think that these extracts have already extended to an unreasonable length, we cannot resist the temptation of laying before them the description and figure of a fish, still more strange, still more unlike the ordinary figure of a fish, than either of those hitherto enumerated. The genus Cephalaspis appears to be numerous both in species and individuals, but somewhat restricted in its geological range. It is the animal already noticed, whose body possesses a pictorial resemblance to that of a trilobite. With the author's description of this most anomalous animal our notice of 'The Old Red Sandstone' must close. We heartily commend the work and the subject to all lovers of nature; it appears to us an ample field for research — a field in which it is impossible to wander without the opportunity at least being afforded of reaping an abundant harvest.

"Has the reader ever seen a saddler's cutting-knife?—a tool with a crescent-shaped blade, and the handle fixed transversely in the centre of its concave side. In general outline the *Cephalaspis* resembled this tool,—the crescent-shaped blade representing the head,—the transverse handle the body. We have but to give the handle an angular instead of a rounded shape, and to press together the pointed horns of the crescent till they incline towards each other, and the convex or sharpened edge is elongated into a semiellipse, cut in the line of its shortest diameter, in order to produce the complete form of the *Cephalaspis*. The head, compared with the body, was of great size, comprising fully one-third the creature's entire length. In the centre, and placed closely together, as in many of the flat fish, were the eyes. Some of the specimens show two dorsals, and an anal and caudal fin. The thin and angular body presents a jointed appearance, somewhat like that of a lobster or trilobite. Like the bodies of most of the ichthyolites of the system, it was covered with variously-formed scales of bone; the creature's head was cased in strong plates of the same material, the whole upper side lying under one huge buckler, — and hence the name *Cephalaspis*, or buckler-head. In proportion to its



Cephalaspis Lyellii.

strength and size, it seems to have been amply furnished with weapons of defence.—Such was the strength and massiveness of its covering, that its remains are found comparatively entire in arenaceous rocks impregnated with iron, in which few other fossils could have survived."—p. 162.

Is it quite certain that Cephalaspis was a fish ? K.

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*Notice of Mrs. Gray's Figures of Molluscous Animals.**

This unpretendingly announced work of Mrs. Gray is fraught with the greatest interest to all who study Conchology. When this study first assumed a name and a place amongst the sciences, attention was only paid to the shell. The gay hues, the polished coats, and the various forms of the solid habitations, were criticised and studied; while the soft inhabitants which formed them were almost completely overlooked. The genera of animals which inhabit shells were reckoned only five in number by Linnæus, nor were there many additions made to that number by his followers for a long period after his time. The celebrated Lamarck, however, saw the necessity of a more careful study of the molluscous animals, and formed a new arrangement of shells upon that basis. Taking advantage of the labours of his predecessors, as the celebrated and philosophic-minded Adanson and others, and of his cotemporaries, as Cuvier, &c., he established a system, which holds the first place in this study at the present day. Since the time of Lamarck many improvements have been made and much new information added to the stock already possessed by us. Various authors have paid attention to particular groups, and much valuable knowledge has been imparted by the naturalists attached to the various expeditions fitted out by different governments, especially the French. Their labours are valuable in the extreme, and the works in which they are published have been splendidly got up under the auspices of the governments which sent them forth. These works, however, though reflecting the highest credit on these governments, are so expensive, that they are accessible only to a few; and the figures of the molluscous animals given by other authors, are scattered over such a variety of scarce and costly works, that to the general student they are almost sealed books. To remedy this want, and to present at one view a continuous series of the interesting class of creatures called *Mollusca*, has been the object of Mrs. Gray in this valuable volume; and exceedingly well has she accomplished it. For

* *Figures of Molluscous Animals, selected from various authors.* By Maria Emma Gray. Vol. i. London: Longman. 1842.

little more than the cost of paper and printing, we have here a work which, to the practical conchologist, more especially if he be likely to visit foreign climes, is of the greatest value. The volume contains 89 plates, in all embracing upwards of 630 figures, illustrating each of the genera into which the Mollusca are now divided, the arrangement being that published by Mr. Gray in the Synopsis of the British Museum. In the preface to this work, written by Mr. Gray, he says —

"The tracings from which these etchings of Molluscous animals have been taken, were originally made by Mrs. Gray for my use, with the view to their being added to my collection of figures of shells, and to aid me in their arrangement. Hoping that others may find such a collection of figures (many of them copied from expensive works, and brought together from sources not easily accessible to conchologists in general), as useful as they have been to myself, I induced Mrs. Gray to make slight etchings of them, which afforded her an interesting occupation during a period when she was confined to the house by ill health."

The book being thus superintended by Mr. Gray himself, and the figures apparently carefully collated with the originals, we can conscientiously recommend it to every student of Conchology. No one about to visit foreign climes ought to be without it, as with the opportunities he will then have of studying the animals alive, he will find this collection of good figures invaluable.

At the present day we believe it to be quite unnecessary to attempt to show the necessity for the conchologist to study the animals which form the shells. We shall content ourselves with pointing out one instance from the book before us, of the interest and value attached to such a study. Most of our readers are perhaps well acquainted with that beautiful, elegant and brilliantly polished genus of shells called *Olives.* If we examine one of these shells we find a strong and rather broad raised belt across the front of the shell; and round the spire we observe a deep groove or canal. How are these formed? Let us turn to plate 18, and we shall see that the animal has a singular acute reflected process in the front of the mantle, situate just behind the siphon; and at the hinder angle a thread-like elongated body, by means of which organs, as the shell is moulded as it were upon the body of the animal, it forms this belt and groove. The difficulty is thus solved at once, and a beautiful adaptation of means to an end is here pleasingly illustrated.

A second volume of this work is announced as forthcoming, and we have no doubt it will reflect great credit upon its amiable authoress, and do much to extend the knowledge of an interesting class of creatures, which have hitherto been too much neglected. W.

Note on the Luminous Appearance of the Sea, with descriptions of some of the Entomostracous Insects by which it is occasioned. By W. Baird, Esq. M.D., Assist. Zool. Dep. British Museum.

The luminous appearance of the sea, so often mentioned by voyagers, is, especially within the tropics, very beautiful and interesting, and depends in a great measure upon the presence of minute Crustacea — such as the Entomostraca more particularly — and Medusæ, the different kinds of animal producing a different kind of luminousness. This I may illustrate by an extract or two from a journal kept during a voyage to India.

"May 28, 1832, lat. 1° 50′ N. long. 24° 07′ W. In the evening the sea, especially in the wake of the ship, where the water was agitated by the ship's way through it, was splendidly luminous; it presented a truly brilliant appearance *at times*, for the beautiful brilliancy of the luminousness was not equal at one time to what it was at another. — Sometimes the broad bright flash, which had distinctly occasionally a bluish colour, was vivid enough to illuminate the sea for some distance round, while the most splendid globes of fire were seen wheeling and careering in the midst of it, and by their brilliancy outshining the general light. These bodies were generally too deep in the water to be caught by throwing a bucket or net overboard.

"May 29. Lat. 0° 35′ S. long. 26° 02′ W. The sea was very luminous again this evening, but differed from last night in there being fewer large globes deep in the water, and a much greater abundance of bright small specks on the surface. Drawing a bucket-full of water up, about 8, P.M., I allowed it to remain quiet for some time, when upon looking into it in a dark place, the animals could be distinctly seen emitting a bright speck of light. Sometimes this was like a sudden flash, at others appearing like an oblong or round luminous point, which continued bright for a short time, like a lamp lit beneath the water, and moving through it, still possessing its definite shape, and then suddenly disappearing. When the bucket was sharply struck on the outside, there would appear at once a great number of these luminous bodies, which retained their brilliant appearance for a few seconds and then all was dark again. They evidently appeared to have it under their own will, giving out their light frequently at various depths in the water, without any agitation being given to the bucket. At times might be seen minute but pretty bright specks of light dart across a piece of water, and then vanish, the motion of the light being exactly that of the Cyclops through the water. Upon re-

moving a tumbler-full from the bucket and taking it to the light, a number of Cyclopes were accordingly found swimming and darting about in it.

"May 30. Lat. 3° 35′ S. long. 27° 18′ W. At times to-night the brilliancy of the water was sufficient to illuminate the whole stern of the ship and driver, and almost intense enough to throw a shadow. Occasionally a streak of luminous water was observed, running a long way out to windward; and then a whole host of bright balls were seen in the space cut by the ship, wheeling and careering along, and being mixed up with innumerable smaller spots, gave out such a bright light that it almost dazzled the eye to look steadily upon it." —Private Journal, H.C.S. Berwickshire.

The bright large balls or globes described above were no doubt Medusæ, and the smaller spots Entomostraca. These latter were very abundant, but, from their minute size they were difficult to be observed; and being very delicate and short-lived, were generally found dead and partially decomposed in the morning, if the water in which they were taken had been kept all night. The most common belong to the family Cyclopidæ, several new species of which I succeeded in placing in the microscope, a description of these I here append.*

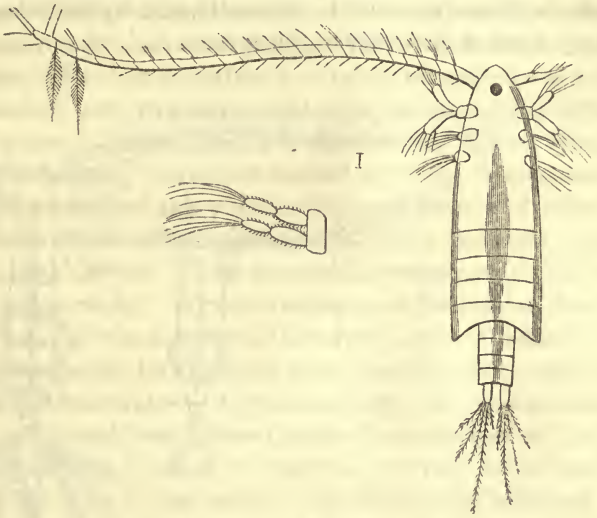
Genus.—Cyclopsina, *Edwards.*

Cyclopsina Arietis. Calanus Arietis, Templeton, Trans. Ent. Soc. i. 195, t. 21, fig. 9. Of an ovate form. First pair of antennæ long, many-jointed, and furnished with numerous setæ; the two last joints having each a long and strong bristle rising from the under surface, directed downwards and finely ciliated or plumose; the last joint has in addition to its long setæ, two short ones springing from its upper surface, directed upwards and not plumose: second pair of antennæ short, stout, divided into two branches of one joint each, terminated by rather long setæ. The body consists of five articulations, the last having a lobe on each side projecting beyond the articulation. Tail much shorter than the body, the last joint being bifurcated, each division giving out four or five moderately long filaments, which are beautifully and finely plumose. The abdominal legs are four pairs, beset closely with short spines on each side, and furnished with numerous long hairs or setæ.

This species is described by Mr. Templeton in the 'Transactions of the Entomological Society.' He takes notice of the ciliated or plu-

* These insects belong to the order Copepodes of *Edwards:* Lophyropa, *Latreille:* and to the family Cyclopidæ: Monocles of *Edwards:* Carcinoidæ of *Latreille.*

mose setæ at the end of the antennæ, the fine cilia of which he says are perpetually in motion, but he does not mention the finely plumose filaments of the tail: the second pair of antennæ he describes as feet. Mr. T. observes that the fin-legs could not be well made out, on account of the minuteness of the animal, but that they appeared pretty numerous.

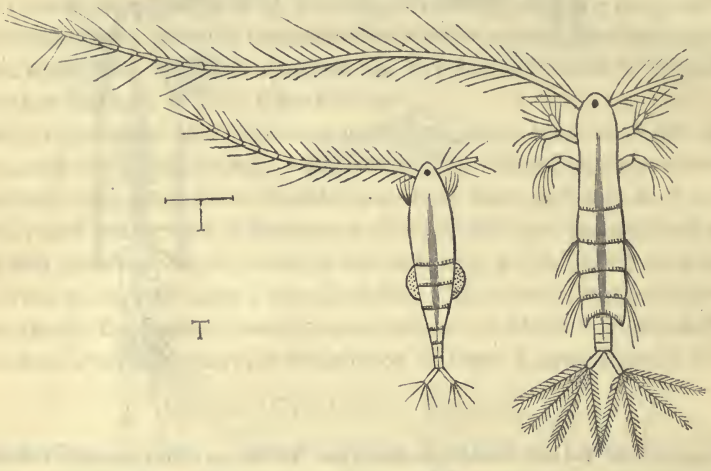


Cyclopsina Arietis. The short line shows the natural size. The detached figure represents an abdominal leg.

Inhabits the Atlantic Ocean. I first met with it in lat. 12° 38′ N. long. 20° 14′ W. on the 21st of May, 1832; and again off the Cape of Good Hope, in lat. 35° 29′ S. long. 21° 50′ E. when I noticed the male also, which is distinguishable by the swelling and large joint of the right antenna. During the previous night the sea was luminous.

The genus Cyclopsina is constituted by Milne Edwards, to receive those species of the genus Cyclops of Muller, which have the second pair of antennæ divided into two branches. The type of the genus is the Cyclops rubens of Muller, the Monoculus Castor of Jurine. The genus Calanus was established by Leach, to receive those species which had no second or posterior pair of antennæ, and had the anterior ones very long. The type of this genus is the Monoculus finmarchicus of Gunner. On reference however to the figure of this species given by Gunner, in the Kiobenhavn. Selsk. tom. x. p. 175, fig. 20—23, it appears that a second pair of antennæ do exist in it, and as they are found in all the other species resembling it, it is evident that the genus Calanus, as constituted by Leach, cannot stand. I have therefore preferred the genus formed by Milne Edwards.

Cyclopsina Rivillii, Baird. Body of animal nearly cylindrical, slightly sinuated on each side, about the middle of first articulation. Tail short. Antennæ very long, nearly double the length of the body, numerously articulated, and covered with long setæ. The last articulation of tail is bifurcated, each division giving out four rather long filaments, which are strongly and beautifully plumose or feathered; these plumose filaments could be distinctly seen by the naked eye, and form a very marked character of the species.



a *b*

a. Cyclopsina Slabberi. *b*. Cyclopsina Rivillii. The lines show the respective sizes.

Inhabits the North Atlantic Ocean. "May 22, 1832, in lat. 10° 53′ N. long. 20° 30′ W., the water appearing luminous during the night, I drew up a bucket-full to be examined in the morning." "Found several animalcules in the water drawn up last night, one of which is the species described above."—Private Journal.

M. Godeheu de Riville, in a paper on the luminousness of the sea published in the Mem. Savans Etrang. vol. iii., describes an insect which he caught in the sea off Ceylon, and found to be luminous in the water, which very closely resembles this species, (vide p. 275, t. 10, fig. 5). He gives it two eyes, and the whole figure is exaggerated, but the plumose tail is given with very considerable accuracy, and I have little doubt it is the same species as the one here described. He calls it, from the extreme beauty of the tail, the "Paon de Mer." M. de Riville (after whom I have named the species), says "the plume with which the tail is ornamented deserves particular attention. The extremity of the body is terminated by a fork, each branch of which has a projection, to which are attached four true plumes of a rose co-

lour, which produce an admirable contrast with the green colour of the body, which is a little transparent and spotted with brown rays, artfully arranged. *Quelles découvertes ne doit on pas espérer de faire désormais dans l'Histoire Naturelle, puisq' on trouve des poissons avec des plumes!* "—p. 275.

Cyclopsina Slabberi, Baird. Body oval. Tail short. Antennæ long, shorter than in the last species, about the length of the whole insect; numerously articulated and provided with rather long and numerous setæ. The last articulation of tail is bifurcated, each division being furnished with five short stout setæ, which are not plumose.—The ova, in the specimen figured in my Journal, appear lying across the centre of the body instead of the tail, as in the Cyclopsina Castor, &c., and I have noticed this peculiarity in my notes at the time.

Inhabits the Southern Indian Ocean. "July 20, 1832, in lat. 11° 36′ S. long. 105° 39′ W. The water this evening was still more luminous than last night. Upon drawing up a bucket-full from alongside, and leaving it at rest for a short time, several beautiful bright spots or bodies might be distinctly seen floating in it, and at times darting through the water with great rapidity. Upon examination in the morning, I found four different kinds of animalcules in it, of which two were species of Cyclops. There is no doubt these were the luminous bodies seen in the water, and which were observed darting through it at such a rate."—Private Journal.

Slabber, in his work upon the microscope,* gives a figure of a "Zee-water luis," which very much resembles this species, (see p. 52, t. 17, fig. 3). He represents it with two eyes, and makes body and tail in one, but the antennæ and caudal filaments, together with the general form of the animal, leaves no doubt in my mind as to the identity of the two insects: I have therefore named it after him as its first observer.

Genus.—Oithona,† *Baird.*

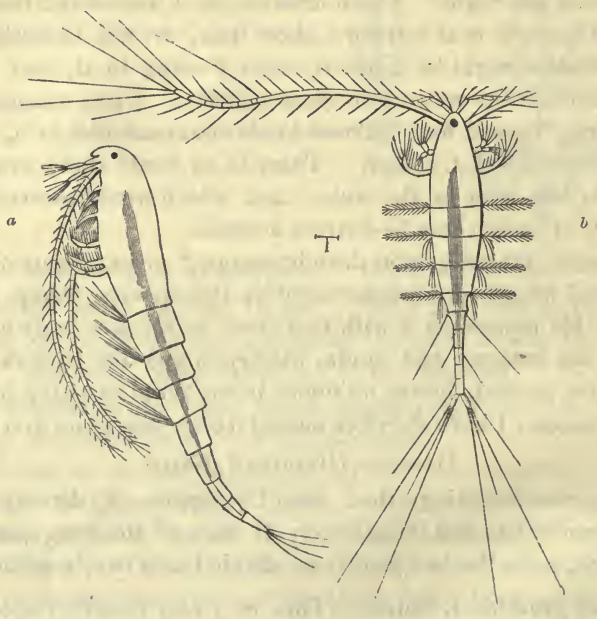
This genus is distinguished from Cyclopsina, by having a pair of short antennæ situated immediately in front of the long pair. The antennules, as in the last genus, are divided into two branches.

Oithona plumifera, Baird. This is a very beautiful species, but very minute in size. The body is rather slender, oval, and of an elegant appearance. Tail elongated and slender. The long antennæ are fully the length of the whole insect, numerously articulated and cili-

* Natuurkundige Verlustigingen behelzende Microscopise Waarneemingen, &c., door Martinus Slabber. 1778.

† *Oi-thona*, Virgin of the wave.

ated, the cilia or setæ being long, especially at the extremities, where the antennæ are knobbed or dentated on the upper surface. Immediately above the long antennæ are the two short ones, each consisting of only about two or three articulations, and furnished with setæ: the antennules, as in the genus Cyclopsina, to which this insect is nearly allied, are divided into two branches, which are terminated by rather long cilia. On each side of the body, attached to the sides of the insect, we see four feathery bodies, which spread out straight from the body, the use of which I do not know; they did not appear attached to the legs, nor did their movements seem apparently connected with them. Being regular in number and situation, they would appear to belong to the insect and not to be parasitical. The legs are each furnished with numerous setæ or branchial filaments, as in all the other insects of this order. The last articulation of the tail is bifurcated, each of the divisions sending off two long filaments and a short one.



a. Oithona splendens. *b*. Oithona plumifera. The line shows the natural size of both.

Inhabits the Atlantic Ocean. "May 27, 1832, in lat. 3° 24′ N. long. 22° 07′ W.; during the middle watch, the sea was observed to be extremely luminous. In the morning drew up some water from alongside, and upon examining it found several small animals in it, one of which is the one here described."—Private Journal.

Oithona splendens, Baird. Body long and rather slender. Tail tapering. Long antennæ about the length of the body of insect, numerously articulated, and furnished with numerous very short setæ or prickles: the upper short antennæ are terminated by a bundle of rather long setæ. First segment of body long. Last articulation of tail terminated by several short setæ or filaments.

Inhabits the South Atlantic Ocean. Off the Cape of Good Hope. "June 18, 1832, in lat. 36° S. long. 10° E. Observing in forenoon large flocks of the bird called the snow petrel by sailors, flying about and very low on surface of water, hauled up a bucket-full from alongside, and found a great many Cyclopes in it, one of which was the species here figured." "June 23rd, lat. 38° S. long. 31° E. The sea this evening was very luminous. While drawing up a bucket of water from alongside, in addition to numerous bright spots in the water, there was one adhering to the rope near the neck of the bucket. At first, the moment it was withdrawn from out of the water, this spot appeared about the size of a crown piece or dollar. As the water however left the rope and it became a little drier, the spot became smaller, but still of a beautiful luminousness and of a slight bluish tinge. Upon bringing it to the light I found, to my no small surprise, that this large and bright mass of fire proceeded from a small species of Cyclops. I removed it with a pencil from the rope, and placed it in a tumbler-full of water, in which there was also another specimen taken from the same bucket. It was very lively, and when the glass was removed to a dark place, these two little creatures again began to be distinctly luminous. Upon examining them by the microscope I found them both to belong to the same species, and that they were exactly the same as that taken and figured on the 18th of June." — Private Journal. W. Baird.

Notes on Captures of Hymenopterous Insects at Hawley, and description of a new British Bee. By Frederick Smith, Esq., Curator to the Entomological Society.

To the north of the quiet little village of Hawley, in Hampshire, is a wood, about a mile and a half in length by a quarter of a mile in breadth; it is composed of fir, with the exception of about one hundred yards at the end towards the village, and terminates in an abrupt sloping sand-bank with a southern aspect, forming altogether one of the most desirable localities which any collector of Hymenoptera

could conjure up to his imagination. I will mention some of the species which I have captured there.

Mutilla europæa
Myrmosa melanocephala
Pompilus niger
affinis
petiolatus
cinctellus
fasciatellus
Ceropales maculatus
Ammophila sabulosa
hirsuta
Miscus campestris
Tachytes pompiliformis
Tachytes unicolor
Astata boops
Nysson spinosus
bimaculatus
Arpactus tumidus
Psen ater
Mimesa equestris
bicolor
Cerceris arenaria
ornata
labiata
Eumenes atricornis
Panurgus ursinus
Megachile circumcincta
Nomada cornigera
Jacobæa
picta
Sheppardana
Andrena Rosæ
thoracica
Colletes, new species
Osmia leucomelana
Saropoda bimaculata
rotundata

Saropoda bimaculata and rotundata I consider to be the same insect in different states, the specimens of rotundata being fine and recently developed. I have compared my specimens with those in Mr. Kirby's collection, from which he drew up the descriptions for his 'Monographia Apum Angliæ,' and am satisfied that they are one and the same insect.

The Saropodæ are on the wing in July, but having visited this locality on the 4th of June last, I dug up a portion of the bank where their burrows were numerous, and met with some cocoons, all exactly resembling each other, which I had no doubt were those of Saropodæ, as they proved to be, for during the first week in July three specimens were developed, and from one of the cocoons a Cœlioxys. The latter is a male, and as I consider it a new species, I send you a minute description of it. It is certainly not the male of either C. conica or C. rufescens, nor is it the C. vectis of Curtis.*

I had observed the Cœlioxys entering the burrows of Saropoda, and had little doubt of its being a parasite. I have also seen it enter the burrows of Osmia bicornis and of Megachile circumcincta. Mr. Shuckard, in the Introduction to his admirable work on the Fossorial Hymenoptera, has remarked on "the apparent anomaly of parasites being of the same order;" and suggests that probably "a greater resemblance was necessary between the individuals, than in the case of internal parasites,"—destroyers of eggs and larvæ,—since "where the food stored up is the object of attack, it required all the sagacity of

* On close inspection of the original specimen of C. inermis of Kirby, it proves to have the usual teeth on the thorax; but this part having been crushed the spines are forced under a portion of it: one spine may, however, be detected on a careful examination. The insect is, in fact, a male of C. conica.

the insect introducing her intrusive progeny to evade the instinctive apprehension of the laborious mother, and nature has furnished additional means to foil the latter, in the parasite's resemblance to herself." This, Mr. Shuckard observes, "appears plausible, but it is not yet substantiated, nor is it general;" and certainly Cœlioxys is an instance of great discrepancy between the two insects. Now, I would observe that in the case of a solitary bee, like Saropoda, I do not see that a resemblance could be of any great service to the parasite, for I doubt not the bee would repel the intrusion even of one of her own species; and where the nests are left without any sentinel to guard them resemblance is unnecessary. But the case is different amongst the social Hymenoptera; and here we find the resemblance complete, as between Apathus and Bombus, and even of the Diptera parasitic on them the resemblance is very close, as between Bombus terrestris and Volucella bombylans, but I cannot call to mind any very strong similitude amongst the solitary species and their parasites. I this year bred Nomada Schæfferella from the cocoons of Eucera longicornis, between which there is a vast discrepancy; as there also is between Andræna fulva and Nomada ruficornis, which I have seen entering its burrows, and have no doubt is its parasite; and to instance but one more, Chrysis dimidiata and Epipone spinipes.

Much of the history of these Hymenopterous parasites still remains a mystery. Do the bee and the parasite both deposit an egg in the same store of food? This I should infer must frequently be the case, nature has therefore wisely provided that the parasite shall be first extruded from the egg, when it consumes the store provided for the bee, which consequently perishes. This inference I have no doubt is correct, as I dug up a number of the cocoons of Eucera longicornis, and on opening some of them I found two specimens of Nomada Schæfferella perfectly developed and active, whilst the Euceræ, in many instances, appeared to have but recently changed to pupæ, and did not attain their perfect state until the beginning of June. I shall probably at a future opportunity refer to the interesting subject of parasite bees. During the last seven years, whilst assiduously collecting, I have carefully investigated the habits and economy of this interesting family, and hope my notes and observations made during that period may prove acceptable to the readers of 'The Zoologist.'

Cœlioxys umbrina. — Dark brown: abdomen with five uninterrupted fasciæ: the face covered with longish pale fulvous hair; the mandibles and cheeks with silvery hair: thorax densely clothed with fulvous hair above, and with silvery hairs beneath; the scutellum has

two acute teeth: intermediate and posterior femora clothed with silvery hairs, the anterior fimbriated with long silvery hair; two acute spines at the base of the anterior coxæ; all the legs pubescent, with the claws ferruginous: the wings have a dark margin: the abdomen has a longish fringe of luteous hair encircling the first segment, the remaining segments have also continuous bands of short decumbent luteous hairs. The spines at the apex are similar to those in C. conica, but the whole insect is much more finely punctured, particularly on the abdominal segments. F. Smith.

Newington, December, 1842.

Note on the Capture of Moths on Grass. On the evening of the 20th of August last, my friend Mr. Bedell and myself were returning from mothing in the marshy fields between the Kent Road and the Greenwich Railway, having had but very little success, when a moth was seen to rise from the grass, and being caught, it proved to be Graphiphora punicea. We next began to sweep the grass, and were surprised to find moths, not singly or in dozens, but in hundreds. The next night saw us there with lanterns and other necessary apparatus, and if we were surprised the previous night, we were then much more so. Almost every blade of grass had its insect; in fact I do not believe that so many moths were ever before seen together. The majority were females, and Mr. Bedell found some eggs which had apparently been recently deposited on the grass. Several subsequent visits were paid to the spot, and always with the same results; the number of moths visible, however, varying greatly on different nights, cold and windy weather having its usual effect in diminishing the number. The species taken were Graphiphora plecta, G. punicea, G. C-nigrum, Lytæa umbrosa, Segetia xanthographa, Gortyna micacea, Apamea fibrosa, Leucania pallens, Orthosia lunosa, Lozotænia costana, Nomophila hybridalis. A number of larvæ were also found feeding on Chenopodium, grass, &c., which have laid up for the winter.—*J. W. Douglas; 4, Waterloo Place, Coburg Road, Kent Road, December* 6, 1842.

Note on the appearance of the Peacock Butterfly in December. So excessively mild and pleasant has this day been, that its resemblance to spring appears to have deceived one of our finest butterflies, the peacock, (Vanessa Io), a splendid specimen of which I have just had the pleasure of seeing on a sunny bank, and on my approach it darted off with a flight as bold as if it had been the middle of summer. —*W. Gaze; Lavenham, December* 13, 1842.

*Notice of British Quadrupeds.**

(Continued from p. 11).

In works of this kind there is little scope for originality, unless the author has been also an experienced and diligent observer; therefore when taking up any of our recent works on British Natural History, we feel scarcely authorized to treat them as original works, and rather incline to enquire what improvements have been made on the standard authorities. Indeed with some subjects certain names become so completely associated, that we feel disposed to deny the right of subsequent authors to interfere; we almost regard them as intruders. Although this feeling may possibly be carried to an illiberal excess, yet are we in every instance justified in comparing, with scrupulous accuracy, the new with the standard work. We know that these new histories must of necessity be compilations from the works of earlier authors; and we feel inclined to search, with some slight degree of severity, for the improvements and additions that have been incorporated. In British quadrupeds we regard Bingley's admirable and most amusing volume† as such an authority: it is a work overflowing with information, and one which we open with feelings of affection and gratitude for the instruction and happiness it afforded our boyish days. In the present instance we are bound to admit that the more recent work contains numerous and valuable additions, more particularly in the orders of Cheiroptera or bats, and Cetacea or whales, Bingley having recorded only five species of the former, and omitted all notice of the latter.

After an introductory chapter on bats, in which the subject is treated with considerable skill, Mr. Bell describes no less than seventeen species; the noctule (*Vespertilio noctula*), the hairy-armed bat (*V. Leisleri*), the particoloured bat (*V. discolor*), this and the preceding introduced on the authority of single specimens in the British Museum; the pipistrelle (*V. pipistrellus*), the pygmy bat (*V. pygmæus*), introduced on the authority of a specimen in the British Museum, which we believe is generally thought to be the young of another species; the serotine (*V. serotinus*), the mouse-coloured bat (*V. murinus*), a name formerly applied, and we think correctly, to the common bat of Britain; Bechstein's bat (*V. Bechsteinii*), Natterer's bat (*V.*

* *A History of British Quadrupeds, including the Cetacea.* By Thomas Bell, F.R.S., F.L.S., V.P.Z.S., &c. London: Van Voorst. 1837.

† *Memoirs of British Quadrupeds.* By the Rev. W. Bingley, M.A., F.L.S.

Nattereri), the notched-eared bat (*V. emarginatus*), perhaps introduced by a mistake of Geoffroy's, no British specimen being known; Daubenton's bat (*V. Daubentonii*), the whiskered bat (*V. mystacinus*), the long-eared bat (*Plecotus auritus*), the lesser long-eared bat (*P. brevimanus*), probably the young of the preceding; the barbastelle (*Barbastellus Daubentonii*), the greater horse-shoe bat (*Rhinolophus ferrum-equinum*), and the lesser horse-shoe bat (*R. hipposideros*).*

As may be anticipated, the bulk of Mr. Bell's observations on this interesting order of animals have been frequently before the public; the following passages are selected as containing matter that is either new or not generally known.

The pipistrelle, or common bat of Britain.

"There is one circumstance of considerable interest which I have observed in this species, which, I believe, has not ever been noticed, and which, it is probable, appertains also to others. It is the prehensile character of the extremity of the tail. A small portion of the tail in this and in most other species of this family is exserted beyond the margin of the interfemoral membrane. Not only does the animal employ the tail in horizontal progression—in which case it assists in throwing forward the body, by being brought into contact with the ground on either side alternately, corresponding with the action of the hinder foot on the same side,—but in ascending and descending a rough perpendicular surface, this little caudal finger holds by any projecting point, and affords an evident support. This is particularly conspicuous when the bat is traversing the wires of a cage, in which situation I first observed the fact." —p. 27.

The long-eared bat.

"It is one of the most common of our British bats; and the extraordinary development of the ears, their beautiful transparency, and the elegant curves into which they are thrown at the will of the animal, render it by far the most pleasing: it is also more readily tamed than any other, and may soon be brought to exhibit a considerable degree of familiarity with those who feed and caress it. I have frequently watched them when in confinement, and have observed them to be bold and familiar even from the first. They are very cleanly; not only cleaning themselves after feeding, and at other times, with great assiduity, but occasionally assisting each other in this office. They are very playful too, and their gambols are not the less amusing from their awkwardness. They run over and against each other, pretending to bite, but never harming their companions of the same species; though I have seen them exhibit a sad spirit of persecution to an unfortunate barbastelle which was placed in the same cage with them. They may be readily brought to eat from the hand; and my friend Mr. James Sowerby had one during last summer, which, when at liberty in the parlour, would fly to the hand of any of the young people who held up a fly towards it, and

* Mr. Gray in this country, and M. Selys de Longchamp on the continent, have lately introduced new specific characters of bats, derived from the mode in which the membrane is connected with the hind foot. As these characters appear likely to facilitate the distinguishing of species, they will be noticed at length in an early number of 'The Zoologist.'

pitching on the hand, take the fly without hesitation. If the insect were held between the lips, the bat would then settle on its young patron's cheek, and take the fly with great gentleness from the mouth: and so far was this familiarity carried, that when either of my young friends made a humming noise with the mouth in imitation of an insect, the bat would search about the lips for the promised dainty.

"The progression of this species on the ground differs considerably from that of all the species of true Vespertilio that I have seen. Instead of running quickly along the ground in a horizontal posture with the head low, the fore parts are somewhat raised and the body thrown forward by successive jerkings, given alternately on one side and the other.

"The large and beautiful ears are usually folded under the arm during sleep, especially if the sleep be profound: and this is also the case during hybernation; the long tragus then hangs down, and gives the animal the appearance of having short and slender ears. Indeed, a person who had not seen it in the act of folding its ears, could never imagine it to be the same species when they are fully expanded. This circumstance refutes the notion suggested by Edwards and adopted by Pennant, that the 'lesser ear may possibly serve as a valve to close the larger in the sleeping state of this animal.'

"The cry of this species is acute and shrill, but not loud. It affords a rather remarkable illustration of the well-known fact, that some persons are incapable of detecting certain sounds; as during the time that I kept several of them living, although their small sharp cry was distinctly audible to persons sitting much farther from them than myself, and though I bent my attention closely to them, listening with the greatest intentness, I could not detect the sound unless I placed my ear close to their cage, though it was uttered frequently. On being disturbed, the sound becomes more clear and piercing."—p. 54.

The barbastelle.

"It was taken during a very hard frost, in the latter end of December, in a large chalk cavern at Chiselhurst in Kent, which is excavated at the bottom of a shaft seventy feet deep. In this cavern, during very severe frosts, several species of bats are found to retreat; and on this occasion, I received with the barbastelle a specimen of V. mystacinus, three of V. Nattereri, and several of Plecotus auritus. My little prisoners, when brought into a warm room, soon began to exhibit signs of vivacity; and the barbastelle, with the others, fed readily on small bits of meat, and drank water. He was a timid animal, and did not evince the slightest disposition to become acquainted with me; he would take his food, however, with his companions, and was accustomed to rest with them in a cluster, at the top of the box in which they were placed. The barbastelle certainly became torpid more readily than any of the others, and more completely so; but when awake, evinced extreme restlessness, and was incessantly biting with great violence at the wires of his box. When suffered to fly about the room, he flew very low, and less actively than any other under similar circumstances; and he was fond of lying before the fire on the hearth-rug, where he appeared quite to luxuriate in the warmth. Whilst the long-eared bats evinced much attachment to each other, and became very familiar with me, the barbastelle remained sullen and apart; until at length I found that he was an object of persecution on the part of his more active companions, one of whom I detected in the act of giving him a severe bite on the back of the neck. This occasioned his immediate removal to another box; but this sharp discipline probably hastened his death, which took place about a week after-

wards, though he continued to eat till the day before he died. The specimen was a male, and apparently adult."—p. 64.

Among the insectivorous quadrupeds we have no additions: they are the hedgehog (*Erinaceus europæus*), the mole (*Talpa europæa*), the common shrew mouse (*Sorex tetragonurus*), the water shrew (*S. fodiens*), and the oared shrew (*S. remifer*).

As an illustration of the food occasionally eaten by the hedgehog, Mr. Bell quotes the account related by Mr. Broderip, in the first volume of the 'Zoological Journal,' of Professor Buckland's hedgehog and the snake.

"'Having occasion to suspect that hedgehogs, occasionally at least, preyed on snakes, the Professor procured a common snake, and also a hedgehog, and put them into a box together. Whether or not the former recognised its enemy was not apparent; it did not dart from the hedgehog, but kept creeping gently round the box; the hedgehog was rolled up, and did not appear to see the snake. The Professor then laid the hedge-hog on the snake, with that part of the ball where the head and tail meet downwards, and touching it. The snake proceeded to crawl — the hedgehog started, opened slightly, and seeing what was under it, gave the snake a hard bite, and instantly rolled itself up again. It soon opened a second, and again a third time, repeating the bite; and by the third bite the back of the snake was broken. This done, the hedgehog stood by the snake's side, and passed the whole body of the snake successively through its jaws, cracking it, and breaking the bones at intervals of half an inch or more; by which operation the snake was rendered motionless. The hedgehog then placed itself at the tip of the snake's tail, and began to eat upwards as one would eat a radish, without intermission, but slowly, till half the snake was devoured. The following morning the remaining half was also completely eaten up.'"—p. 78.

Our author gives a long and very interesting history of the mole, which appears to be an especial favourite with him: the authority principally consulted is a work published in 1803, by a M. Cadet de Vaux, detailing the researches of one Henri le Court, who retired from a lucrative office under the reign of terror, and consoled himself as well as he might for the loss of wealth and state, by studying the habits of the mole; and really the French moles of the era of Robespierre, seem to have been decidedly in advance of the English moles of the era of Victoria, as far as fortification, encampment and mining are concerned, and even in speed, for the speed of a frightened French mole, on the testimony of Geoffroy, was equal to that of a horse at full trot.

Of the bear tribe the badger (*Meles taxus*) is the only example.

Of the Mustelidæ or weasel tribe, we have the following examples. The otter (*Lutra vulgaris*), the weasel (*Mustela vulgaris*), the stoat (*M. erminea*), the polecat (*M. putorius*), the marten (*M. foina*) and the pine marten (*M. Martes*).

The following notes on the weasel are interesting.

"The weasel climbs trees with great facility, and surprises birds on the nest, sucks the eggs, or carries off the young. It has been asserted that it attacks and destroys snakes: this, however, I believe to be entirely erroneous. I have tried the experiment by placing a weasel and a common snake together in a large cage, in which the former had the opportunity of retiring into a small box in which it was accustomed to sleep. The mutual fear of the two animals kept them at a respectful distance from each other; the snake, however, exhibiting quite as much disposition to be the assailant, as its more formidable companion. At length the weasel gave the snake an occasional slight bite on the side or on the nose, without materially injuring it, and evidently without any instinctive desire to feed upon it; and at length, after they had remained two or three hours together, in the latter part of which they appeared almost indifferent to each other's presence, I took the poor snake away and killed it.

"Far different was this weasel's conduct when a mouse was introduced into the cage: it instantly issued from its little box, and, in a moment, one single bite on the head pierced the brain, and laid the mouse dead without a struggle or a cry. I have observed that when the weasel seizes a small animal, at the instant that the fatal bite is inflicted, it throws its long lithe body over its prey, so as to secure it should the first bite fail: an accident, however, which I have never observed to occur when a mouse has been the victim. The power which the weasel has of bending the head at right angles with the long and flexible, though powerful neck, gives it great advantage in this mode of seizing and killing its smaller prey. It also frequently assumes this position when raising itself on the hinder legs to look around."—p. 143.

"It is, however, sometimes itself the prey of hawks; but the following fact shows that violence and rapine, even when accompanied by superior strength, are not always a match for the ingenuity of an inferior enemy. As a gentleman of the name of Pinder, then residing at Bloxworth in Dorsetshire, was riding over his grounds, he saw, at a short distance from him, a kite pounce on some object on the ground, and rise with it in his talons. In a few moments, however, the kite began to show signs of great uneasiness, rising rapidly in the air, or as quickly falling, and wheeling irregularly round, whilst it was evidently endeavouring to force some obnoxious thing from it with its feet. After a short but sharp contest, the kite fell suddenly to the earth, not far from where Mr. Pinder was intently watching the manœuvre. He instantly rode up to the spot, when a weasel ran away from the kite, apparently unhurt, leaving the bird dead, with a hole eaten through the skin under the wing, and the large blood-vessels of the part torn through."—p. 145.

The question of the identity of the common and pine marten is discussed at some length, but without any satisfactory result: both the supposed species are figured.

The wild cat (*Felis catus*) is the only example of its family. It is one of those animals which appear on the eve of total extermination; the supposed specimens of this creature which so often ornament the doors of our barns being invariably wanderers from some neighbouring cottage or farm-house: none the less deserving of their fate, for having once lived a decent and orderly life.

The fox is the only example of the dog tribe now wild in Britain.

Mr. Bell does not describe the well-marked varieties of the fox, which many sportsmen suppose to be species.

Of the seal tribe no less than four are enumerated: the common seal (*Phoca vitulina*), the harp seal (*P. grœnlandica*), the great seal (*P. barbata*), and the grey seal (*Halichœrus Gryphus*). Of these the first and last only can be included among British animals. Mr. Bell also gives the walrus (*Trichecus Rosmarus*) as one of the seal tribe.—The following interesting account of seals is by Mr. Ball of Dublin.

"'When I was quite a child, I took much pleasure in watching seals, from the coasts of Cork and Waterford, and early became impressed with an idea that I could distinguish at least four species. Some years ago, on stating my opinions to some zoological friends, I was induced to set about collecting specimens and information from various parts of the coast. For a considerable time I procured only one species; and finding this labelled in our museums as Phoca vitulina, I took it for granted that it was so, until I procured a cranium of a very different species from Sligo, which on examination I found to belong to the true Ph. vitulina. I then sought to ascertain to what species the former specimens belonged; and, kindly aided by Dr. Scouler, searched in vain all the authorities to which we could get access. Failing to obtain information, I was induced to bring the matter before the British Association; when Professor Nilsson recognised the crania I produced as those of the seal described by him as Halichœrus griseus, *Ph. Gryphus*, Fab.

"'My observations on the habits of the animal do not altogether accord with those of the learned Professor, who stated that it was solitary in the Baltic, whilst here I have seen it often in small parties, and learned from fishermen that they have noticed as many as thirteen congregated on a rock. I may remark, that to observe seals on a populous coast requires great patience and a practised eye; for the animals are much on the alert; and experience seems to have taught them the prudence of retiring to their caves, or going out to sea, on the approach of man: so that unless surprised, or discovered from a distance and cautiously advanced on, an observer has little chance of getting near them.

"'Colour, in the present instance, appears to be a character of little value; for in the many specimens I have seen of both sexes and of all ages, I do not remember that any two were precisely similar. The very young females seem to be generally of a dull yellowish white, with rather long hair, which falls off in about a month or six weeks, and gives place to a shorter and more shining coat, variously blotched with blackish grey: this is brighter at first, and gradually grows more dull, and the blotching more indistinct on the upper parts, as the animal advances in age; whilst on the breast and lower parts the blotches in some specimens show almost as distinctly as the spots on a leopard. From a peculiarity in the hair of the adult, it being considerably recurved, and as if its upper surface were scraped flat with a sharp knife, the animal, when dry, and with its head turned towards the spectator, appears of a uniform silvery grey, whilst viewed in the opposite direction, it appears altogether of a sooty brown colour; the spots or blotches being only visible on a side view. The only male specimen I possess died young: it has long yellowish hair, slightly tinged with brownish black on the back; it is black on the muzzle, chin, and cheeks, extending round the eyes, but not to the upper part of the nose; and the palms of the fore paws are black.

"'My father has made several attempts to rear and tame this seal, but in vain. It appears scarcely susceptible of domestication, and the development of its skull seems to indicate as much; for the size of the brain of a specimen nearly eight feet long did not exceed that of one of Phoca variegata (vitulina) of less than four feet. The head and general form of Halichærus are long in proportion to its rotundity, comparatively with other seals.

"'On examining the remains of Donovan's Ph. barbata, now in the British Museum, I recognised in it an ill-put-up specimen of our Halichærus; and I presume the stuffer has endeavoured to make the specimen correspond with the description of Ph. barbata, by unduly plumping up the snout and shortening the thumbs, which are evidently pushed in by the wires intended to support the paws. Sir Everard Home figured, in the 'Philosophical Transactions' of 1822, a cranium from a drawing belonging to Mr. Hunter, of 'the skull of the great seal deposited in the British Museum from the South Seas.' I suspect that there is some mistake in the reference of the letter-press to the figure; and the reference in Griffith's Cuvier seems also incorrect. Could the skull from which the figure is taken have belonged to Donovan's seal? I have a similar skull from a similar seal that I killed myself, and feel much inclined to believe it did.

"'I find that the palatal foramina furnish a good character; for while in Halichærus they open in or on the palatal bones, they in several species of Phoca open in the maxillaries. This is a character of value, as it is not influenced by age. The hairs of the whiskers in this species are flattened in one direction, and contracted at regular intervals in the other; so that when viewed in front they appear linear, when seen sideways they are moniliform. Their colour varies from whitish horn colour to blackish.

"'It occurred to me several years since that I could kill seals by going to the mouths of their caves, and striking them with a harpoon as they dived out. Acting on this, in August 1829 I went to Howth properly equipped, and took a position at the mouth of a cave, in which I could hear the inmates baying loudly like large dogs. On making a noise from the boat, several seals passed out with great velocity, at the depth of about eight feet: one I struck with an oar, and another with a harpoon, but not effectually, as it gave way after a short struggle. Learning from the failure, we made ready for the next, which I could distinctly see at the bottom of the water, attentively watching us, sometimes advancing and again retreating: it seemed scared by the harpoons, which the friend who aided me and I held so deep in the water as only to offer it room to pass. After a considerable time so spent, we raised our weapons a little, when it made a start to escape, but in vain, as both our harpoons struck it, mine penetrating even to its heart. It twisted the shaft out of my hands and broke it short off, though between two and three inches in diameter; it then pulled our boat out to sea, and when compelled to come to the surface, we fired two shots into it before it ceased violent exertion. The quantity of blood was enormous, spreading to a great extent on the surface of the water. I estimate the weight of the animal, though in poor condition, to have been upwards of five hundred pounds; its skeleton now measures seven feet two inches; it was a very aged female, judging from the state of its teeth, yet it appeared to be suckling young, as there was milk in its mammæ.'"—p. 279.

We have two examples of the squirrel tribe, the common squirrel (*Sciurus vulgaris*) and the dormouse (*Myoxus avellanarius*), and eight

of the mouse tribe, the harvest mouse (*Mus messorius*), the long-tailed field mouse (*Mus sylvaticus*), the common mouse (*Mus musculus*), the black rat (*Mus rattus*) and the brown rat (*Mus decumanus*): all these species are well-known animals, and nothing new occurs in their history: the others are called *voles;* the water rat (*Arvicola amphibius*), the short-tailed field mouse (*A. agrestis*), and the bank vole or bank mouse (*A. pratensis*); the last is a recent addition to our British quadrupeds for which we are indebted to Mr. Yarrell, by whom it was described in the 'Proceedings of the Zoological Society' for 1832, p. 109, under the name of Arvicola riparia. There appears to be a fourth species of vole indigenous to this country: it is described by Mr. Thompson under the name of *Arv. neglecta*, (Ann. and Mag. Nat. Hist. vii. 274). Mr. Jenyns thinks this may prove to be the *Mus agrestis* of Linneus, while our short-tailed field mouse he supposes to be the *Arv. arvalis* of Pallas.

In the hare tribe Mr. Bell describes four species, the common hare (*Lepus timidus*), the Irish hare (*L. hibernicus*), the varying hare (*L. variabilis*), and the rabbit (*L. cuniculus*). The Irish hare is an addition to our British animals, brought into notice by the Earl of Derby.

"In the year 1833, the Earl of Derby, then Lord Stanley, and President of the Linnean Society, sent to that society a specimen of the hare of Ireland, which his lordship had obtained at Liverpool. It was described by Mr. Yarrell at that time, and subsequently at a meeting of the Zoological Society in the same year. A careful examination of several specimens has assured me that it is not merely a variety of the common hare of England, but that it is specifically distinct. The characters in which it principally differs from the latter are as follows:—It is somewhat larger; the head is rather shorter; the ears are even shorter than the head, while those of the English hare are fully an inch longer; the limbs are proportionally rather shorter; and the hinder legs do not so much exceed the fore legs in length. The character of the fur is also remarkably different: it is composed exclusively of the uniform soft and shorter hair which in the English species is mixed with the black-tipped long hairs, which give the peculiar mottled appearance of that animal; it is therefore of a uniform reddish brown colour on the back and sides. The ears are reddish grey, blackish at the tip, with a dark line near the outer margin. The tail is of nearly the same relative length as in the common species. The numerous discrepancies in the colour and texture of the fur, and in the form and proportion of the different parts of the animal, appear to me to be too important to constitute merely the characters of a variety.

"It cannot be confounded with the alpine hare, although the relative length of the ears is nearly the same; the size and form of the body, the tail, and the texture and colour of the fur being strikingly different.

"It is certainly a very remarkable circumstance that it should have remained unnoticed until so late a period; and can only be accounted for by the fact that it is the only hare found in Ireland, and that therefore the opportunity of comparison did not frequently occur. The fur of this hare, from the absence of the long fine dark hairs which constitute the beauty of the common species, is considered of no value."—p. 341.

Of deer we have but two, and these, the noblest of our *feræ naturâ*, are becoming very rare.

The roe-buck: the following passage from one of the author's cor respondents is interesting, and we do not recollect having seen the observations elsewhere in print.

"The roebuck is now rarely met with in England; though it still abounds in many parts of Scotland. 'They are not frequently met with,' says Mr. Tytler, in a letter with which he has lately favoured me, 'in larger numbers than two or three at a time; but we find their couches among the heather, as if a larger party, perhaps six or seven, had lain together. They scrape off the heather, and make a form like hares, which they also resemble in keeping to the same tracks, and in stopping frequently, if a sudden, not very loud noise is heard. The roe seems to be extremely cautious; and they make use of their fine sense of smelling, as well as hearing, to warn them of an enemy. They will scent a man a long way off, and hold their noses in the air, like a pointer drawing on his game. A usual way of deceiving them is, to hold a lighted peat in the hand, while approaching or lying in wait for them, as the animals are accustomed to this smell, and less guarded in coming towards the spot. Their cry is like the baa of a sheep, but more concentrated, so as to sound somewhat like a bark: at night especially, and in still moonlight, the cry may be heard to a great distance, and they are constantly answering each other through nearly a whole night.

"'The roe,' continues Mr. Tytler, 'is never known to turn on its enemy when wounded; but bad wounds are sometimes received from its horns while it lies tossing its head in agony. It is very active; and I have seen one bound, without much apparent effort, across a road nearly twenty feet wide. Their usual pace, unless when hard pressed, is a long, rather awkward canter; but when closely hunted, or suddenly startled, their bounds are the most rapid and beautiful that can be conceived. They often come down on the corn-fields and peas in the neighbourhood of their haunts, feeding entirely in the grey of the morning or evening. The usual method of killing them is to drive the wood with hounds and beaters, the shooters being placed so as to command the tracks or passes; and caution is necessary to avoid the windward side, as the roe will not approach if it smell the enemy. This sport is very tiresome; and a much more exciting mode is, to walk quietly through their haunts in the earliest dawn, and endeavour to get within shot of them; which, however, is by no means easily effected.'"—p. 409.

Of the Cetacea or whales no less than fourteen are enumerated; the dolphin (*Delphinus delphis*), the bottle-nosed dolphin (*D. Tursio*), the porpoise (*Phocæna communis*), the grampus (*P. orca*), the caaing whale (*P. melas*), the white whale (*Beluga leucas*), the bottle-head (*Hyperoodon bidens*), Sowerby's whale (*Diodon Sowerbyi*), the narwhal (*Monodon monoceros*), the spermaceti whale (*Physeter macrocephalus*), the high-finned cachalot (*Physeter Tursio*), the common whale (*Balæna mysticetus*), the finner or Rorqual (*Balænoptera boops*), and lastly, the northern manati (*Rytina borealis*), an animal of which we scarcely possess any information; its occurrence appears to have been purely accidental, the dead body having been thrown on shore

near Leith. This is an animal of great interest to the naturalist, and is more likely than any other of which we have any knowledge, to have given rise to the stories of sirens and mermaids. Although it has frequently been seen at sea, specimens have very rarely found their way ashore, and of the entire animal kingdom no species is so rarely met with in museums.

The following may be considered a tolerably correct list of the British Quadrupeds, as enumerated by Mr. Bell. We have introduced some slight alterations in the nomenclature, and on a future occasion intend suggesting others, more especially as regards the bats. The whales are purposely omitted, as we consider them too imperfectly known to admit of any precision as to their specific differences.

BAT TRIBE.

Noctule, *Vespertilio Noctula*
Hairy-armed bat, *V. Leisleri*
Particoloured bat, *V. discolor*
Pipistrelle, *V. Pipistrellus*
Serotine, *V. serotinus*
Mouse-coloured bat, *V. murinus*
Bechstein's bat, *V. Bechsteinii*
Natterer's bat, *V. Nattereri*
Daubenton's bat, *V. Daubentonii*
Whiskered bat, *V. mystacinus*
Barbastelle, *V. barbastellus*
Long-eared bat, *Plecotus auritus*
Greater horse-shoe bat, *Rhinolophus ferrum-equinum*
Lesser horse-shoe bat, *R. hipposideros*

INSECTIVORA.

Hedgehog, *Erinaceus europæus*
Mole, *Talpa europæa*
Shrew, *Sorex tetragonurus*
Water-shrew, *S. fodiens*
Oared shrew, *S. remifer*

BEAR TRIBE.

Badger, *Meles taxus*

WEASEL TRIBE.

Otter, *Lutra vulgaris*
Weasel, *Mustela vulgaris*
Stoat, *M. erminea*
Polecat, *M. putorius*
Marten, *M. Martes*
Pine-marten, *M. foina*

CAT TRIBE.

Wild Cat, *Felis catus*

DOG TRIBE.

Fox, *Canis Vulpes*

SEAL TRIBE.

Common seal, *Phoca vitulina*
Grey seal, *Halichærus Gryphus*
Walrus, *Trichecus Rosmarus*

SQUIRREL TRIBE.

Squirrel, *Sciurus vulgaris*
Dormouse, *Myoxus avellanarius*

MOUSE TRIBE.

Harvest mouse, *Mus messorius*
Long-tailed field mouse, *M. sylvaticus*
Common mouse, *M. musculus*
Black rat, *M. rattus*
Brown rat, *M. decumanus*
Water rat, *Arvicola amphibius*
Short-tailed field mouse, *A. agrestis*
Bank mouse, *A. pratensis*

HARE TRIBE.

Hare, *Lepus timidus*
Irish hare, *L. hibernicus*
Varying hare, *L. variabilis*
Rabbit, *L. cuniculus*

DEER TRIBE.

Red deer, *Cervus elaphus*
Roebuck, *C. capreolus*

Anecdote of Instinct or Reasoning Power in a Cat. Passing by the back window of a neighbour's house a short time since, I saw

a favourite Tom cat seated on a table near the window, beside a narrow-necked cream-jug containing milk: no person was in the kitchen. He was smelling the milk and endeavouring to reach it with his tongue, but could not; at last he inserted one of his fore paws and withdrew it, the fur saturated with milk; after he had licked it clean he dipped it again, and kept repeating the process as long as I remained observing him, which I did for several minutes, and then left him to his employment, for I thought he had well deserved his reward by his ingenuity.—*James Bladon; Pont-y-Pool, December*, 1842.

Note on some species of Bats occurring near Teignmouth. As bats have already engaged the attention of your correspondents, a short notice of those found in this neighbourhood may perhaps be acceptable. The best way of procuring them is by a common mothing net, in which they may easily be taken; this is much preferable to shooting them, both as it saves the time which would otherwise be employed in finding the dead ones, and a useless destruction of their lives is thereby avoided, since the common kinds may be suffered to escape again. The species found in this neighbourhood are the following:—the greater horse-shoe bat (*Rhinolophus ferrum-equinum*), scarce; the lesser horse-shoe bat (*R. hipposideros*), one specimen; the barbastelle (*Vespertilio barbastellus*), scarce; the long-eared bat (*Plecotus auritus*), and the mouse-coloured bat (*Scotophilus murinus*),* both common. One evening I caught for a friend a female of Plecotus auritus; in the morning there was a young one in the cage with it: on the next day, when I called to enquire after the captive, he took it out of the cage to show me his new acquisition, when the mother, finding herself at liberty, immediately flew away, carrying her young one hanging to her breast, and seeming in no manner inconvenienced by the burden, since she flew so far that it was entirely out of our power to capture her again.—*Robert C. R. Jordan; Teignmouth, January* 17, 1843.

Anecdote of Bats flying by daylight. The following fact relative to the bat (*Vespertilio Pipistrellus*) I do not find to have been mentioned by writers on Natural History. On referring to my journal of 1837, I find that this animal had made its appearance as early as the 27th of April, at which time it was busily flitting about at noon-day, the sun shining brightly at the time. From that period to the present I have frequently observed it under similar circumstances, up to the end of December. Daubenton's bat I also shot whilst flying about in

* Does our correspondent mean the common bat? There is, unfortunately, much confusion at present in the nomenclature of this tribe.—*Ed.*

the middle of the day last summer. — *Robert John Bell; Mickleover House, near Derby, January* 19, 1843.

Birds.

Note on the early incubation of Birds. The extraordinary mildness of the present season has brought forth many of the spring flowers; even the birds have anticipated their usual period of incubation. A nest of the hedge-accentor, with eggs, was taken at Eashing last week, and a pair of carrion crows have recently built a nest at Wintersale Park, the seat of Geo. Barrett, Esq. — *J. D. Salmon; Godalming, January* 9, 1843.

Note on the early Nests of the Sparrow. On the 20th of December last was found at Darley-abbey, Derby, the nest of the sparrow (*Passer domesticus*) with four eggs; and on the 22nd of February, 1842, I also observed one building its nest in the spout of the schoolroom at the same place.—*Robert John Bell; Mickleover-house, near Derby, January* 19, 1843.

Note on the occurrence of the Black-cap in January. I have much pleasure in forwarding for 'The Zoologist' the following interesting and singular fact in Ornithology. On Friday, the 20th of January, 1843, I had brought to me by a gentleman a fine male specimen of that sweet and melodious bird of song, the black-cap warbler (*Curruca atricapilla*, Bech.), which had been caught on the 18th instant in a common bird-trap baited with apple, in the township of St. John in Bedwardine, near the city of Worcester. The usual time for this bird's appearance is towards the latter end of April or beginning of May, as the seasons are late or early; when, on the summit of some tree in our gardens, it will frequently greet us with its clear and well-defined notes.— *G. Reece; Museum, Foregate St., Worcester, January* 20, 1843.

[No *migration* of this species could have taken place, and we presume it must have been a bird hatched too late to leave us with his kindred.—*Ed.*]

Note on the late departure of Swallows, &c. in 1842. Owing to the mildness of the season the swallows have remained late. I shot a specimen of Hirundo rustica on the 9th of November; it was a young bird, and without the long tail-feathers. This was the last swallow I saw, but the house-martin continued with us in tolerable plenty until the end of November; and I saw two on the 5th and one on the 9th of December.—*Robert C. R. Jordan; Teignmouth, January* 17, 1843.

Note on the late departure of Swallows in 1842. The swallows

and martins assembled in large flocks about the last week in September, and to all appearance left us on the 5th of October: I did not see a swallow or martin during the remainder of October, but on the 4th of November we were visited by a large flock of swallows (*Hirundo rustica*) and martins (*H. urbica*); the thermometer was at about 38° in the morning when I first saw them, and at about 48° during the hottest part of the day, the wind at N.E.; on the 3rd it blew very strong from the S.S.E. They remained with us until the 16th of November, not frequenting their usual haunts, but keeping more about the town; the weather was exceedingly mild during their stay, the thermometer being seldom below 50°. On the 17th of November the wind was N.N.E., and the thermometer at 38°. On the 22nd there were a few stragglers to be seen, mostly swallows; on the 28th I saw one swallow flying over the houses of the town; on December the 4th I saw three or four swallows flying about the houses, and on the 7th of December there was one swallow flying up and down the same street for about half an hour, but I could neither see nor hear of another anywhere. This was the last appearance for the year that has come under my notice. I think there can be no doubt that the protracted stay of the swallows was induced by the exceeding mildness of the season, but it seems a curious fact that they should have returned to us with a gale of southerly wind, and then leaving us with the first northerly wind, after remaining twelve days. Perhaps it may not be amiss to state that this is not a favourable locality for sand-martins.—*James J. Trathan; Falmouth, January* 28, 1843.

Note on the late departure of the Swallow in 1842. It struck me as worthy of notice that during last summer I scarcely saw a swallow in the vicinity of London; in the month of September I occasionally observed one or two; in October they were more numerous, and during the week ending October 22nd, they were quite abundant, even in the most crowded and noisy thoroughfares, and I observed them continually passing the window of the printing-office in Ratcliff Highway. In November I repeatedly saw three or four in the neighbourhood of Camberwell and Peckham; and I learn from a gardener in the employ of Mr. Bevington, of Camberwell Terrace, that during the last week in November he saw a great number of swallows flying over. —*Edward Newman; Peckham, January*, 1843.

Note on the late departure of the Swift in 1842. When returning from shooting on the salt marshes at Salthouse, near Cley, on the north coast of Norfolk, on the 25th of September, I saw three young swifts playing around some sand-hills, in company with a large flock

of young swallows and martins. I observed no old birds of either of the last species, as my attention was mostly directed to the swifts. It was a bright sunny day and very warm; I could not have been mistaken in the birds, as they played round our heads whilst we stood looking at them for a considerable time after I had pointed them out to my companion, Mr. C. Rippingall.—*E. W. Dowell; Jesus College, Cambridge, February* 3, 1843.

Note on the occurrence of the Orange-legged Hobby. As I perceive that your pages are open to notices of rare British species, you will perhaps give insertion to the two following instances of the occurrence of the orange-legged hobby (*Falco rufipes*),* earlier than any mentioned by Mr. Yarrell, to whom I neglected to communicate them in time for their appearance in his work.

When I was at school in Wiltshire in 1825, I bought a small hawk from a countryman, who said he had seen it pursued and struck down by a raven in Littlecote Park near Hungerford. He caught it on the ground before it recovered, and according to his account it laid an egg after its fall, which was broken. I was a tolerable ornithologist for a school-boy, but the yellow claws and strange markings of my bird puzzled me to identify it with any of the English hawks, and I made a drawing of it, sufficiently accurate to recognise it by. It was fortunate I did so, for the bird, which was very wild and untameable, escaped after a few days' captivity, and was probably killed, as it had one wing clipped. Some years after, on showing the sketch at Oxford to Mr. N. C. Strickland, he recognised it as identical with one of which he had a drawing, taken from a bird shot several years before in Yorkshire; but neither he nor I knew the species, till we saw the bird in the Zoological Gardens. Both these specimens were females. I may notice one character which I never saw expressed in any figure —the lower bars on the tail being forked or divided at the side. Gould's plate shows only the under side of the tail of the female, in which position this is not visible.

The white or yellowish claws are usually considered as confined to this species and the lesser kestril (*Falco tinnunculoides*); but I once had a tame kestril (*F. tinnunculus*), in which two claws on each foot had become white in the course of several years, and the others were beginning to change their colour when the bird died.—*Frederick Holme, M.A., F.Z.S.; C.C.C. Oxford, January* 29, 1843.

Note on the occurrence of the Cassian Heron, (Ardea comata).†

* *Falco vespertinus*, Gm., and Doubleday's Nomenclature.

† Squacco Heron. *Euphus ralloides*, Bonap. and Doubleday's Nomenclature.

The specimen of the Cassian heron from which the following description is taken, was caught alive on the broads near Ormesby (near Yarmouth, Norfolk), in high condition, about the year 1820 or 1821. After having been kept alive for two days, it was killed, the proper mode of feeding it not being known, and the skin was stuffed. The bird was a male, about 16½ inches in length; the bill is 2½ inches long, and shaped like that of the common heron; for about an inch downwards from the tip it is black, from thence yellow gradually deepening into black to the base: the opening of the nostril is long, narrow and black. The bill opens directly under the eyes, which are yellow: the back of the head is a reddish yellow, beautifully variegated with black streaks running down the neck, and becoming fainter till they entirely cease at the back, which is covered with long hair-like reddish yellow feathers, in the same manner as the back of the egret, which give the bird a very elegant appearance. The wings are white, with the exception of the ends of the quill feathers, which are of a light brown colour: from the back of the head grow seven or eight feathers, each between five and six inches long; these feathers are white fringed with black; they are rather more than a quarter of an inch in breadth at the base, and taper gradually to the end, the whole forming a very beautiful plume. The chin of this bird is white, and the under parts a faint yellow. The legs are rather short when compared with those of other herons. Excepting this one and a bad specimen in the British Museum, no birds of this kind have ever been found in England. The breast-bone of this bird when taken out was found to be exceedingly small, not bigger than a lark's; it is now unfortunately lost.—*E. W. Dowell; Jesus College, Cambridge, February* 3, 1843.

Note on the occurrence of Birds lately ascertained to be British. The latest additions to the catalogue of our British birds are the following six. 1. Savi's warbler (*Sylvia luscinioides*, Savi). Two specimens of this warbler, obtained in the fens of Cambridgeshire, are now in the British Museum; they were noticed by Mr. Geo. R. Gray, in the 'Annals of Natural History,' vi. 155. Joseph Clarke, Esq., of Saffron Walden, has also obtained one or more examples of this species, which are placed in the Museum at Saffron Walden. 2. Dalmatian Regulus, (*Regulus modestus*, Gould). A single specimen of this very rare bird was shot near Hartley, on the coast of Northumberland, by Mr. John Hancock, of Newcastle-upon-Tyne, as recorded in the 'Annals of Natural History,' ii. 310. 3. White wagtail, (*Motacilla alba*, Linn.) Since Mr. Gould published his observations,

pointing out the distinctions between this species and the very common and well-known pied wagtail of this country, various specimens of the true M. alba of Linneus have been obtained in the counties of Middlesex, Sussex and Cumberland. 4. Shore pipit, (*Anthus aquaticus*, Bechstein). It has been ascertained, by a comparison of specimens, that the A. aquaticus of Bechstein is distinct from the rock pipit of British authors; and we are indebted to Mr. H. Doubleday, for the opportunity of recording the shore pipit as obtained in this country. 5. Short-toed lark, (*Alauda brachydactyla*, Temm.) A single example of this species was caught in a lark-net near Shrewsbury, at the latter end of October, 1841. The specimen is in the possession of Mr. H. Shaw, of Belle-vue Villa, near Shrewsbury. 6. The whiskered tern, (*Sterna leucopareia*, Natterer). One example of this rare tern has been killed near Weymouth.* — *Wm. Yarrell; Ryder St., St. James's, February*, 1843.

Note on the occurrence of Woodcocks at Twizell House, in July, 1842.—

"Mr. Selby has also communicated the following notice: — On the 23rd July, 1842, when walking through a straggling whin-covert, on the edge of the moor to the west of Twizell, Mr. Selby was surprised by flushing a woodcock from a small patch of ferns, within a yard or two of his feet; and scarcely had he satisfied himself that he was correct in the bird, when another rose from the same place, which he shot, and which proved to be the male in tolerable feather and condition. No nest or young were discovered, though they might easily have been overlooked on the rough ground where the old birds were disturbed, and no doubt they had remained in the locality for the purposes of nidification, the habitat being peculiarly favourable for such purposes, dry ground for roosting, and abundance of springy places at hand. Mr. Selby states that this is the first instance of woodcocks remaining over summer in his immediate neighbourhood."—*From the Annual Address of the President of the Berwickshire Naturalists' Club, September* 28, 1842.

Note on the occurrence of a Woodcock near Torrington, for five successive years.—

"In the year 1833 a woodcock with white feathers in the wings was observed in a cover on the manor of Monkleigh, near Torrington, in the county of Devon. The same bird, or one of exactly similar plumage, re-appeared in the same place during the four succeeding seasons, in which period it was so repeatedly shot at by different persons without effect, that at last it acquired among the country-people the name of 'the witch.' In the year 1837, however, it was killed by John Piper of Monkleigh, while following the owner of the property which it frequented, the Rev. J. T. Pine Coffin of Portledge, who has now the stuffed specimen in his possession.

"The white feathers are the primary quills and bastard winglets of each wing, the remainder of the plumage being of the ordinary hue. These feathers are all of a pure

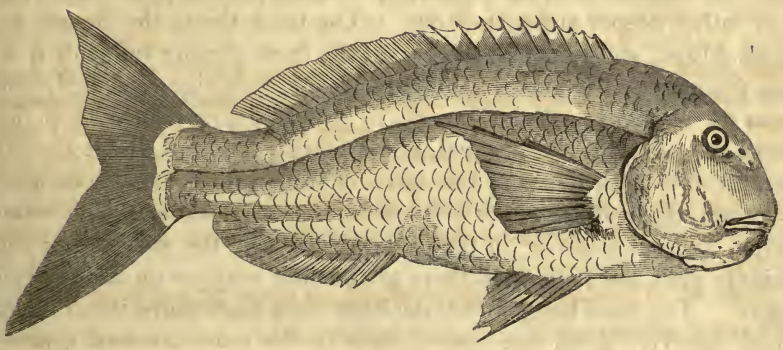
* The particulars appear in the December part of Mr. Yarrell's 'History of British Birds.'

white, and seem to be of a closer and stronger texture than usual, but no other peculiarity is observable. It is however worthy of notice, that the cover which formed its constant haunt when not disturbed, is a piece of wood not exceeding fifty acres in extent; thus proving the disposition of the woodcock to return, not only to the same district, but to the same spot which it has once frequented, and to which it is probably first directed by the parent bird, or by other companions older than itself."—*Proceedings of the Zoological Society, October* 12, 1841 ; p. 79.

Note on Birds in March.—

"On the 11th, the lesser pettychaps or chiff-chaff is sometimes heard, but is more commonly later. The stone-curlew appears about the same time. The jack-snipe and woodcock take their departure. The wheatear arrives about the 23rd or 25th, and the blackcap and redstart, in the southern counties, appear at the end of the month if the weather is very fine."—*Van Voorst's Naturalists' Almanack, for* 1843.

Note on the occurrence near Polperro, in Cornwall, of a Fish new to the British Catalogue, and supposed to be the Orphe of Rondeletius. By Jonathan Couch, Esq., F.L.S., &c.



Couch's Sea-bream.

The sparoid fishes are found to bear so considerable a resemblance to each other in form and colour, and until very recent times have been so inadequately represented in figures, most of which have been taken from dried skins, in which all the distinguishing marks of life and separation from one another have been lost, — that we need not

wonder if we occasionally find the synonymes misapplied, the references to ancient authors misplaced, and certain species sometimes rediscovered, that have a better title to a designation than others which for a time have been permitted to bear it. Another fertile source of error arises from the fact, common indeed to species of other families in Nature, that several fishes bear different names in different places; and, still worse, in some instances the same name is applied by the same people to separate species, not from supposing them the same, but from some characters which they possess in common, of which this name is descriptive, though in other respects the species widely differ. Many curious instances might be given in illustration of these remarks, but scarcely any one has led to a greater extent of confusion than the species I am about to describe, which appears to have been known to some ancient naturalists, but which hitherto does not seem to have fallen into the hands of any recent enquirer.

The specimen here figured was taken November 8th, 1842, with a baited hook, at a place termed the Edges, a margin of rocky ground running parallel with the land at the distance of three miles south of Polperro. The weight was six pounds; the body in figure and thickness not unlike that of the common sea-bream (*Pagellus centrodontus*), but rather deeper and more stout. The head thick, the muzzle remarkably so, and rounded, the line of the front sloping suddenly from the forehead to the mouth; the eyes of moderate size, elevated, and near the front, iris yellow: nostrils in a slight depression, the superior large and patulous: jaws equal, in a line with the front, the lower one with a well-marked chin: the teeth in front rather stout, somewhat separate, those of the upper and lower jaws interlocking. The scales large, and conspicuous on the posterior plate of the gill-covers; the middle plate has none, and there are but few vestiges on the anterior plate. The head being short, the back rises high above it. The lateral line very dark, less curved than in the more common sparoid fishes, and scarcely continued full to the tail; the body terminating in a defined form at the caudal fin, with an incision opposite the direction of the lateral line, it is also somewhat contracted at the vent. Colour of the front and summit of the head a brownish red; of the back and fins much like that of the braize or becker (*Pagrus vulgaris*), such as would be formed by a mixture of lake and vermilion: fins the same, except the anal, which is a pale yellow: sides a pale red, belly whitish. As the colours faded, at the angles where the scales meet there was a yellow margin.

Fin-rays. — D. 12—10. P. 13. V. 4. A. 38. C. —

The third ray of the pectoral fin longest, the second and first regularly becoming shorter.

The remarkable shortness of the head, the roundness and perpendicularity of the front, equality of the jaws, interlocking of the teeth, and singular chin, are sufficient to distinguish this species from any one hitherto recognized as British; at the same time it so nearly agrees with the figure and description of the Orphe of Rondeletius,* that I have little hesitation in believing it to be the same fish.

It is intimated by Rondeletius, that among the Greeks more than one fish was known by the name of Orphus; and we further learn that the word Cernua, by which some Latin writers have rendered the Greek Ορφος, has been applied to a still greater number of species, all of them distinct from this, and even to the river Rud.†

Ray,‡ who limits the name Orfus to the Rud, describes the fish which he terms Orpheus veterum, from Rondeletius, in a manner to show that he was altogether unacquainted with it; and as the species termed Orphus by Bellonius is the other and more common one known by this name among the Greeks, we need not wonder at finding Ruysch§ resigning all hope of extricating from such utter confusion what he saw might still be a well-defined species.

Nor does it appear that even the most industrious and able naturalists of the present day have been more fortunate than their prede-

* His account is this: — Ορφω ou Ορφως. Les Latins ont rétenu ce nom hors-mis Gaze du quel est appellé Cernua. Il est poisson marin de rivage, aucunement semblable au Pagre rougeastre. Il ha les jeux grands, les dens qui entrent les unes entres les autres. De nombre, de situation d'aelles, d'eguillons semblable au Pagre. Il ha le trou de excremens fort petit; car il ha seulement une petite fente, laquelle vous ne verres sans presser le ventre, il n'ha point de vaisseaux spermatiques. Tel est noster Orphe, au quel convient tout ce que Aristote é Athenée ont attribué. En peu de tems il devient grand, il est mangechaire, solitaire, il ha des dens qui se serrent les unes entre les autres, il est caché en hyver."—p. 139 of the French edition.

† After stating this, Gesner, who copies the figure of Rondeletius, adds, — "Nos (inquit Rondeletius) Orphum hîc non depingimus eum, qui a Græcis quibusdam hodie vulgari lingua Orphi nomine dicitur. Est enim nostro longè major, utpote qui pondere viginti libras æquet, nec sit litoralis. Sed Orphum depingimus ex Aristotele, Athenæo, Plinio. Is Piscis est litoralis magis quam pelagius, Pagro quodammodo similis, colore ex purpureo rubescente, ideo rubentem appellavit Ovidius: (verum hæc apud Plinium ex Ovidio non rectè citatæ leguntur). Ovidius pelagium facit, Aristoteles vero Ælianus litoralem. Oppiano degit in petris cavernosis, quæ plenæ sunt chamis et patellis (quibus nimirum vescitur). Græci hodie, ut dictum est, alium piscem vulgo Orphum vel Rophum appellant; quem Bellonius Orphum facit."

‡ Synopsis, p. 133. § Theatrum Animalium, *i.* 21.

cessors in obtaining a knowledge of this species. Risso makes no mention of it in his 'Histoire des Environs de Nice.' I have only the figures (without the text) of Cuvier's work on Ichthyology to refer to, but the plate of his Pagrus Orfus so essentially differs from the fish under consideration, that I have no hesitation in deciding on their being distinct. We see that it is represented by Rondeletius as solitary and rare, and by Oppian as only locally common; while even Pliny's remark, that it had only been described by Ovid, though erroneous in itself, yet leads to the inference that according to his information it was not often caught: these are circumstances which, taken together, will assist us in understanding the reasons of the doubts which have hitherto hung over this species.

The specimen above referred to, is deposited in the national collection at the British Museum. JONATHAN COUCH.

Polperro, December, 1842.

Note on a Gold-fish having Vegetable Fibres issuing from an Ulcer on its back.

Gold fish, with vegetable fibres growing from an ulcer on its back.

A few years ago a friend of mine had a gold-fish, kept living (as usual) in a glass vase. From some unknown cause it became affected with an ulcer on the back, and from the ulcerated surface a very delicate tuft of vegetable fibres protruded to the length of an inch or more. The fish at length died, and at my request my friend Dr. James Moore of Belfast, made the drawing which I now enclose.

The appearance of the tuft of vegetable filaments is drawn with critical correctness. I examined these filaments repeatedly in the microscope, but could make nothing more of them than that they were simple delicate threads, unarticulated and unbranched.—*Jas. L. Drummond, M.D., Professor of Anatomy; Royal Belfast Institution, January* 17, 1843.

Note on the recent occurrence of new or rare Fishes in England. 1. The Maigre, (*Sciæna aquila*, Cuvier). A fine large specimen of this fish was taken off Margate early in October, and being sent to London, was for some days exposed to view at the shop of Mr. J. S. Sweeting, fishmonger, at the west end of Cheapside. 2. The common Bogue, (*Sparus boops*, Linn.)* A single example of this species about twelve inches long, and new to the British catalogue, was taken in a ground seine at St. Mawes early in October last. The circumstance was communicated to me by Mr. Alfred Fox of Falmouth, who very kindly sent me a coloured drawing of the fish. This species is well known in the Mediterranean, but, out of it, has only been taken at Madeira, at Teneriffe, and once on the coast of Spain. 3. The Sword-fish, (*Xiphias gladius*, Linn.) A specimen ten feet long was taken on the 20th of October, by the crew of a six-oared galley belonging to Mr. Henry North of the Fountain Inn, Deal, who was himself steering at the time, on his way from Ramsgate to Deal. "A little way to the south of the outer beacon leading to Sandwich Haven, saw the fish in about four feet water; rowed towards it, and observed that it appeared far exhausted in strength, ventured to put a small rope with a running noose over its tail, and after playing with it some time, succeeded in putting other ropes round the fish and got it on board. Steered for Deal, well pleased with our prize." From the point of the upper jaw to the anterior margin of the eye was one third of the whole length of the fish. This specimen was purchased by Mr. Sweeting of Cheapside, who, after exhibiting it for a few days, presented it to the Zoological Society. 4. The short Sun-fish, (*Orthagoriscus mola*, Schneider). A young specimen, only eighteen inches long and thirteen inches deep, was caught off Great Yarmouth in the first week of October, and was for some days exposed to view at the shop of Mr. Groves, the fishmonger of Bond St., London. 5. The oblong Sun-fish, (*Orthagoriscus oblongus*, Schneid). Mr. L. L.

* *Box* vel *Boops*, Bellonius de Aquat. 230. *De Boope*, Rondeletius, Latin edition, 136. *De la Bogue*, Rond. French edit. 123. *Boops Rondeletii primus*, Will. Hist. Pisc. 317, tab. U, 8. f. 1. *Bogue*, Duhamel, part ii. sect. 4, pl. 6, f. 4. *Box vulgaris*, *Le Bogue commun*, Cuvier et Valenciennes, Hist. des Poiss. vi. 348, pl. 161.

Dillwyn of Swansea, sent me word in October that a young oblong sun-fish had been recently washed up on the sands there, and was preserved at the Institution. This is the more rare species of the two.—*Wm. Yarrell; Ryder St., St. James's, February*, 1843.

Notes on Mollusks, &c. observed at Whiting-bay, in the Isle of Arran, in August, 1842. By the Rev. David Landsborough, Minister of Stevenston, Ayrshire, N. B.

Every naturalist knows the pleasure arising from visiting a new locality, even for a few days. Though the whole of this pleasure cannot be imparted to others, some portion of it might, could naturalists be induced to take up the pen, though they may have no discoveries to boast of, and nothing very remarkable to communicate.

Were I disposed to try my hand at description, I should have a fine field in all that I saw from the time that I left the harbour of Ardrossan till I reached Whiting-bay, after touching at Brodick and Lamlash. And were I inclined to geologise, I should here have ample scope, since Arran is an epitome of the Geology of the world. Instead however of even looking at the twenty-five square miles of granite in the centre of the island, pushed up by some tremendous power, and rising into pinnacles nearly 3000 feet in height, let us place ourselves at once on the lowly shore at Whiting-bay; and the chief geological feature which there attracts attention, is the numerous trap dykes which intersect the sandstone, and indurate it in such a manner that it seems to have undergone the operation of broiling. Towards the north of the bay the mass of trap rocks, instead of appearing as veins, assumes in some degree the form of basaltic pillars.

Prowling along the shore among these dykes and rocks, I had the pleasure of discovering Echinus lividus, being the first time that it had been observed in Scotland or England, though it had been found in several places in Ireland. It was not the fine dark purple variety which burrows in limestone rocks, but the greenish variety, the tips of the spines only being purple, their base and the whole crust being greenish. It appears to be gregarious, as wherever it was found there were generally about a dozen in the same little pool, among the rocks. Echinus sphæra was very common; but instead of being found in the little pools, it occurred in rather deep water along the shore, and not congregated like Echinus lividus. From the lightness of its colour it was more easily detected than E. lividus; and when full grown was

twice the size of any specimen of E. lividus I met with. Three fine live specimens of E. sphæra (or esculentus of Fleming) were brought in one evening, and being put into a basin of fresh water that their sufferings might be brief, we were surprised to find next morning that their colour was changed; — spines and crust having become a light grass-green.

I had expected to make some interesting additions to my cabinet of shells, but in this I was a good deal disappointed. There are, I doubt not, plenty of Mollusca in deep water, but I saw very few upon the shore. Cockles there are in abundance in the sand, as well as Solen siliqua, S. ensis and Mactra subtruncata.

Rissoa interrupta was common at the roots of the smaller Algæ, and Montacuta purpurea, Skenea depressa and Turbo tenebrosus were found nestling at the roots of Lichina pygmæa. I found also imperfect specimens of two rare shells, viz., Pecten nebulosus and Pleurotoma gracilis.

I was however much gratified by finding on the sand at a low state of the tide, about a score of very fine live specimens of Bulla lignaria. Though not uncommon on the Ayrshire coast, I had scarcely ever got it there containing the inhabitant. Every conchologist knows that this Bulla has a calcareous gizzard, of even firmer fabric than the external shell. This gizzard is a wonderful piece of mechanism, which one would not expect to find in the interior of a very soft mollusk. Though I had seen it before, I found that I was but imperfectly acquainted with its structure. I thought it was composed of two plates, but I found that there were three; in this respect resembling the gizzard of the still more delicate Bullæa aperta, though differing considerably in form. Two of the plates are triangular, and placed one above the other, like the upper and nether millstones. They are not quite flat, but a little concave externally and rather convex internally; they are bound together with strong cartilage, and on one of the sides of the triangle there is a third valve or plate, giving strength to the cartilage, and keeping the two grinders at some distance, except at the centre, where the convex points meet, and thus leaving, except at these points, room for the reception of food in the triangular space between the two millstones. The food of the Bulla seems to be the fry of other shell-fish. Though they seem to indulge very freely as to quantity, they appear to be wiser than our biped gourmands, for they keep to one dish. In every one of the specimens I procured the capacious gullet was filled with the fry of Mactra subtruncata. The gullet was in the form of a corn-sack, quite distended, for each contained

some scores of these little bivalve shells in an unbroken state. The sack however gradually emptied itself into the gizzard; and in this shelly mill, the shells and their contents were reduced to powder, or rather fine paste, well fitted, we doubt not, to be wholesome nutriment for the industrious little marine miller. Verily I do regret that I have not turned to better account the little modicum of anatomical knowledge which I got many long years ago in the University of Edinburgh. Could I have followed out my researches into the workings of this beautiful mollusk, I am sure that I should have seen still greater cause to admire the goodness and wisdom and power of that benignant Being, who, while he rises far above the highest thoughts of the highest, is not for a moment forgetful of the lowest of the creatures he has formed.

I saw nothing uncommon in Ichthyology or Ornithology, but devoted some time to the search for Zoophytes, and with some little success. Among others I obtained one very fine specimen of Tubulipora orbiculus, much larger and more hemispherical than those occurring on the Ayrshire coast, which are found on Laminaria saccharina, while the Arran one was on an old shell. I also found one remarkably fine example of the Tubulipora lobata of Hassall, but in a much more perfect state than the one which that gentleman has figured. Two fine specimens of Anteunularia antennina var. *ramosa* were given to me by fishermen; and a very fine example of Plumularia myriophyllum with vesicles; these vesicles, which I had never before seen, are as remarkable as those of P. cristata. As these were from deep water, they show what fine things might be obtained by dredging. A pretty Beroë was found, of a kind not uncommon on the Ayrshire coast; clear as crystal, melon-shaped, with its countless ciliæ in constant play.

D. Landsborough.

On the Minute Anatomy of the Horse-Leech, Hirudo sanguisorba, (Sav.), *Hirudo vorax* (Johnston). By John Quekett, Esq., M.R.C.S.

(Continued from p. 21).

The alimentary canal may be divided into œsophagus, stomach, cœca and large intestine. The *œsophagus* is from half an inch to three quarters in length, and extends from the mouth nearly as far down as the genital apparatus, the line of demarcation between it and the commencement of the stomach is very apparent internally, for the

cuticular investment terminates suddenly at the part corresponding to the cardiac orifice of the stomach. It is exceedingly muscular, and its parietes are nearly half a line in thickness; the fibres run principally in a longitudinal direction, by which means the interior is thrown into a number of longitudinal rugæ, circular fibres are however very conspicuous in some parts: some of the longitudinal fibres appear to be inserted into about half the base of the cartilaginous jaws. The separate fibres, when examined with a power of 400 linear, are found to exceed greatly in size those of the muscular tunic, and, like them, they are remarkable for their dotted appearance, (fig. *e* and *f*, p. 92). The stomach is nearly cylindrical in shape; its parietes are thin and easily lacerated, it is slightly constricted at intervals of about a quarter of an inch, at which points it appears to be firmly connected by membranous septa to the walls of the abdominal cavity; it expands a little at its lower third, just before it joins the large intestine or rectum, which appears, as far as size is concerned externally, to be nothing more than a continuation of the stomach.

The cœca are given off from the lower portion of the stomach, one on each side; they are little more than half an inch in length, and about a line in diameter: in some specimens these cœca are larger at their blind extremities than in the middle, in others they gradually diminish in size from their point of connexion to their free extremities: in their natural position they are firmly bound down by cellular tissue to the sides of the rectum. Unless the animal be dissected in water, these cœca may easily be overlooked. The rectum is of a conical figure, being broad above, where it is connected with the stomach, and small below, where it forms the anal outlet, which opens externally on the dorsal surface of the animal immediately above the sucking disk. It varies from three quarters to an inch in length, and is about a quarter of an inch in diameter at its broadest part.

The interior of the œsophagus, as has been stated, is of a white colour, and is thrown into longitudinal rugæ; it is lined with a cuticle of a white colour, which ceases abruptly at the cardiac orifice of the stomach, where there is a constriction; from the muscular fibres being arranged principally in a longitudinal direction, it is capable of considerable dilatation, in which it differs much from the same part in the medicinal leech. The interior of the stomach is of a red colour, and consists of wavy folds of mucous membrane; it appears to be quite free from villi, but the intestine with which it is continuous is largely supplied with them: there is a tolerably well developed constriction or pyloric valve at the junction of the stomach and intestine. The

villi in the intestine, in its undistended state, nearly fill up the whole calibre; they are arranged in longitudinal rows, and when examined in a leech newly killed, with their epithelial investment entire, they form a beautiful subject for microscopical investigation.

Food. — If the alimentary canal of the horse-leech (fig. *l*, p. 17) be now compared with that of the medicinal species (fig. *m*), one cannot fail to observe many striking differences between the two; the stomach in the one being nearly a simple cylindrical tube, whilst in the other it is provided with large lateral sacs or pouches. The cœca, which, in the horse-leech, are so small as to be very easily overlooked, are in the medicinal one of so large a size as to occupy nearly the inferior fourth of the body; the intestine, too, which in the former animal is equal in diameter to the stomach itself, in the latter is so small as to have led many anatomists to deny its existence. These facts, combined with others which have been already alluded to when describing the very great differences in their dental apparatus, cannot fail to prove that the two species must differ as widely in their habits and the quality of their food. It is still maintained by some authors, and the name — horse-leech — which has been given to this species, would tend to support the opinion, that it lived by sanguisuction, and poisonous effects have been attributed to its bite; but many persons, whose veracity cannot be doubted, after repeated trials have failed to make this species adhere to the human skin. Any one who will keep a few horse-leeches in a bottle, and supply them with worms or the larvæ of insects, will soon be convinced of the voracity of their appetite, for they will devour the medicinal leech, and even individuals of their own species. All this is perfectly intelligible, and what an examination of the arrangement of their digestive apparatus, would lead us to suspect was the nature of their food. The medicinal leech, on the contrary, provided as it is with upwards of two hundred cutting teeth, and with a capacious sacculated stomach, with a small œsophagus and still smaller intestine, is eminently qualified for subsisting on liquid food; and as it is a well ascertained fact, that when once they have gorged themselves, the blood will remain for a very long time in their stomach, to all appearance in an unaltered state, it would follow either that their digestive powers must be exceedingly slow, or that the food which they take in with such avidity cannot afford them much nourishment. Is it not more probable, as Professor Rymer Jones has suggested,* that the complicated stomach and inferior den-

* 'General Outline of the Animal Kingdom,' p. 193.

tal apparatus of the medicinal leech "was rather a provision intended to render these creatures subservient to the alleviation of human suffering, than necessary to supply the wants of the animal itself?"

Blood.— The blood of the horse-leech is of a red colour, and when examined microscopically is found to consist of a reddish liquid, or *liquor sanguinis*, containing disks, which are very scantily diffused throughout the *liquor sanguinis*, and present a strange contrast, both in point of number and figure, to those of the human subject or any vertebrate animal. A person unskilled in microscopic observation would readily overlook them. They are for the most part of a circular figure and of a grey colour, and vary considerably in size; the average diameter of the most common disk is about the $\frac{1}{6000}$ of an inch; some few are to be seen of an oval figure, these are generally about the $\frac{1}{4000}$ of an inch in their long by $\frac{1}{3000}$ in their short diameter. Now and then larger disks are to be observed, which present a granular appearance; these are not at all constant in size, some being as large as the $\frac{1}{1000}$ of an inch, whilst others, which are no doubt of the same character, are not larger than the $\frac{1}{4000}$. The disks are figured, of their relative dimensions, at *g*, p. 92.

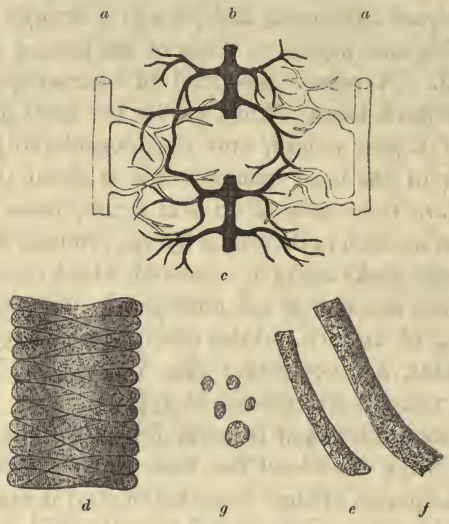
These disks, soon after their removal from the body, become very indistinct; and when the blood has been suffered to remain at rest, it will undergo a species of slow coagulation, and if examined in this state, small patches of the red colouring matter will be found aggregated together in small masses. The coagulation, however, is exceedingly slow, which is to be accounted for by the small quantity of fibrine contained in the *liquor sanguinis*. The colour of the blood appears darker in the vessels belonging to the venous than in those of the arterial system, and M. Derheims states* that if equal quantities of the two kinds of blood be placed on glass, side by side, they are readily to be distinguished by their shade of colour.

The blood, then, of this animal, as well as of many of the Annelida, differs from that of any of the Invertebrata lower in the scale of creation in being of a red colour, and from that of any of the Vertebrata in not having the colouring matter contained in the envelope of the disks, but diffused generally throughout the *liquor sanguinis*.

Vessels.— The blood which we have just described circulates throughout the body in a peculiar series of vessels, which can be to-

* Hist. Nat. des Sangsues; 8vo. Paris, 1825.

lerably well seen without the aid of injection, on account of the dark red colour of the circulating fluid; and some of the smaller branches may be readily discerned by placing a leech, which has been kept for some time without food, in rectified spirit (alcohol), which coagulates the blood in the vessels, and at the same time preserves its red colour, as was, I believe, recommended and first practised by Dr. Kurzman.



a a. Lateral blood-vessels of the horse-leech. *b*. Dorsal vessel. *c*. Abdominal vessel. *d*. Portion of lateral vessel highly magnified. *e*. Muscular fibre of tunic. *f*. Muscular fibre of œsophagus. *g*. Blood-disks.

For our present purpose it will be merely necessary to consider the vascular system as composed of four longitudinal trunks, with their communicating branches. Of these four trunks two occupy the sides of the body, and from this circumstance they are termed the lateral vessels (fig. *a a*), whilst the remaining two are placed, one on the dorsal (fig. *b*), the other on the ventral surface (fig. *c*), in the median line of the body. These two last trunks communicate with each other by smaller branches, termed *dorso-abdominal*), which correspond with each segment of the body, and also with the lateral vessels, by a series of branches termed *dorso-lateral*. The two lateral vessels are considered to form the arterial portion of the system, while the dorsal and ventral vessels correspond to the venous. This distribution of the vessels may be readily understood by reference to the figure, where the arterial system is represented by the light vessels, the venous by the dark

ones. Durondeau* has mentioned the presence of a heart, or central organ of circulation, in the medicinal leech. He describes it as a fleshy pouch, of a conical figure, attached to the back by large vessels but having its apex free. This statement has not been confirmed by any other author; and in all my examinations of the horse-leech, I have never been able to detect such an organ.

The *lateral* vessels (fig. *a a*) run from one extremity of the body to the other, in a wavy course, forming a series of festoons. Some authors describe them as quite straight when the animal is in motion or stretched out, but wavy when the animal is at rest in its constricted state: I have always found them, both in the horse-leech and the medicinal species, to form a series of festoons in every position of the animal, whether the body was dilated by the distention of the alimentary canal with injection, or when in a state of contraction produced either by alcohol or other corrugating fluids. These vessels are largest in the middle of the animal, and diminish gradually in size as they approach the extremities, at which points they become continuous with one another, and here they give off numerous branches to supply the locomotive sucking disk, the mouth, and the organs of sight. As these lateral trunks proceed in their wavy course, they send off branches (dorso-lateral and abdomino-lateral) at nearly equal intervals; by means of these numerous anastomoses, when injection is forced into one lateral vessel, the vessel of the opposite side, and the ventral and dorsal, become filled as well. On opening a leech a well-marked systole and diastole can be seen in the vessels above described; and as no heart can be detected, we must conclude that these vessels, which are so much larger in diameter and thicker in their parietes than either the dorsal or ventral trunks, must perform the function of propelling the blood through the system, in which respect they are analogous to the dorsal vessel of insects. Dr. Rawlings Johnson counted the pulsations, and found that in the first minute there were ten, in the second nine, and in the third eight; they then became irregular and indistinct, and the leech died.

On a careful examination of the lateral vessels by the microscope, the truth of this assertion is fully borne out by the structure then displayed. If a small portion of one of these trunks be made the subject of investigation, it will be found that its parietes are to all appearance highly muscular, it is composed in fact of two sets of bands, arranged like the rings of a trachea, which take an oblique direction

* Journal de Physique, 1782, p. 287.

from one side of the vessel to the other, interlacing with each other at nearly regular intervals and producing a series of intersections, (fig. *d*). The tissue investing these muscular bands, or in other words, the cellular coat of these vessels, on examination with a power of 400 linear, appears well developed and exhibits a fibrous structure, and the fibres intersect each other diagonally; it is covered with numerous ramifying vessels, which contain dark granules like those from pigmental cells, which well exhibit the molecular movement so common to all minute globular bodies.

Each trunk, about its middle, is about $\frac{1}{40}$ of an inch in diameter, and in a space equal in breadth to one diameter, there are about fifteen bands; each band is therefore about $\frac{1}{600}$ of an inch in diameter, and presents a dotted appearance, in which it very much resembles in structure the fibres of the muscular tunic of the œsophagus, and those placed immediately underneath the true skin which have been before described. The dotted appearance is so constant in the fibres of these Hirudinidæ, as to become characteristic of the muscular tissue in this order of animals. JOHN QUEKETT.

(To be continued).

Insects.

Note on the Medic Egger (Lasiocampa Medicaginis). The larva of this moth is not unlike that of the oak egger (*Lasiocampa Quercûs*), but the ground colour, instead of being brown, as in that insect, is of a dingy yellow; the pupa is enclosed in a yellow cocoon. Two caterpillars were found on the cliffs at Teignmouth, and one at Bovey Heathfield; one of them died, one of the others produced a male and the other a female moth. The male is rather smaller than the male fox moth (*L. Rubi*), and is of a bright reddish brown colour; the upper wings have a white spot in the middle between two white streaks, the one near the tip of the wing is well defined, the other more indistinct; an obscure whitish streak passes through the middle of the second pair. The female is larger, of an uniform dull reddish brown, with a white spot in the centre of the upper wings. — *W. R. Hall Jordan: Teignmouth, December*, 1842.

Note on the Capture of Thera juniperata. Having noticed on the evening of the 7th of November, 1842, this insect flying about the juniper-trees which abound on Mickleham Downs, I visited the spot

again on the evening of the 19th of October last, with Mr. Douglas, in the hope of obtaining a few specimens. We commenced beating the bushes about 7 o'clock, and worked hard for upwards of an hour, without success; at last it occurred to me that a close inspection of the junipers by means of the lantern might lead to better results, and accordingly I first examined the outsides of several of the bushes, but could not find a single specimen; I then inspected the insides, and soon discovered one of the long-sought-for insects, hanging from a withered twig near the ground. Knowing now how to proceed, I soon captured about eighteen. On the three following nights I continued to collect them, and finally obtained one hundred and eight fine specimens, in the proportion of about twenty-six males to one female. It seems that on cold frosty nights these insects do not emerge from their hiding places (the interior of the bushes, where they suspend themselves from small dry twigs, or the bark of naked stems), and are consequently easily taken by aid of the lantern. I shook them into pill-boxes, where they would lie perfectly still, without the least attempt at escape. On warm moist evenings they either fly about or settle on the outsides of the trees, and are then very active and captured with difficulty. — *Geo. Bedell;* 4, *Waterloo Place, Coburg Road, December* 29, 1842.

Note on the Caterpillars of Orgyia gonostigma. I have met with the larvæ of this insect (as I have before informed you) occasionally in the autumn. Last September I found a brood feeding on the young shoots of the dwarf oaks; they fed rapidly, but on changing their skin spun slight webs on the top and sides of the breeding cage, and amongst the leaves; to these webs they continued to adhere, and I could not in any way induce them to eat. Some of them have since died, and the rest are in a torpid state. These larvæ do not appear to feed until the sun begins to decline; I have always found them on those boughs which catch the slanting rays, this was the case with the brood above mentioned. I also met with them full fed last May, at the same period of the day. — *Alfred Lambert;* 6, *Trinity St., December* 30, 1842.

Note on Sepsis cynipsea. Towards the end of August I once observed myriads of this insect swarming on the stump of a tree, and seated by hundreds on each leaf that grew on the twigs from the old stock, or buzzing in the air above. — *F. Walker; Grove Cottage, Southgate, December*, 1842.

Note on Bee-hives. I am quite delighted with 'The Zoologist,' and am anxiously looking forward to the appearance of the next number.

I am glad to find the subject of bees has been introduced; this has been a favourite study with me. I have a word or two to say under this head. I have kept bees for upwards of twenty years, and have tried every variety of hive that has been offered to notice during that time, with various success, never losing sight of the principle of *never destroying a bee to obtain the honey.* Of all the various descriptions of hives that have been submitted to public notice to obtain this important end, the "Improved Cottage Hive," as brought into notice in this country by my friend J. H. Payne, Esq., of Bury, Suffolk, in his little work entitled 'The Apiarian's Guide,' is, in my opinion, decidedly the most practicable for the cottager. During the past season I took from three common cottage hives, by means of caps, 38¾ lbs., 33½ lbs. and 32 lbs. of honey, of a very superior quality, without destroying a bee, for which I obtained 2s. per lb., and at the same time leaving an ample store of honey, for on the 1st of October these hives severally weighed, exclusively of the hive, board, &c., 24½, 24, and 28 lbs., being an abundant supply for their maintenance during the present winter. My brother in Rutland, upon the same plan, took from four cottage hives, leaving an average of 24 lbs. of honey for each stock,—48¾ lbs., 48¾ lbs., 35 lbs. and 42¼ lbs., total 175 lbs. of honey of a very superior quality to that which is obtained by the barbarous mode of suffocation. My hives have consumed, from the 1st of October to the 31st of December, a trifle below 6 lbs. each stock, being about 2 lbs. per month; and I expect a similar diminution per month during this and the next month, after which the consumption will materially increase. The leading article in the last number of 'The Quarterly' is upon bees, and is highly interesting; I am quite rejoiced to find that this subject has at length attracted the attention of so powerful a journal. I hope and trust it may be the means, through the instrumentality of the *rich*, of placing in every cottage garden, a row of bee-hives upon the humane system. A few prizes annually given by the Agricultural and Horticultural Societies of the kingdom would do wonders towards accomplishing so desirable an end. I have invariably found the cottager who keeps bees a steady and industrious man, indeed I think it impossible he should be otherwise, the lesson they inculcate must have a beneficial effect upon him, more particularly when the humane system is adopted. — *J. D. Salmon; Godalming, January* 9, 1843.

Note on the Reed-Warbler, (Sylvia arundinacea, *Shaw*).

By Mr. W. H. Thomas.

These merry, courageous, little birds are common within a few miles of London. I have found them in abundance in the reed-beds on the banks of the Thames, between Erith and Greenwich.

In seeking them you must not be afraid of labour in pushing your way through reeds; you must likewise take care to get as firm a footing as possible, for many of these places are very treacherous, and I have more than once suddenly sunk with one leg into a deep hole, and have had some difficulty in extricating myself. When hunting in such places, I generally have a stout hedge-stake or clothes-prop to try the soundings with. From the time that the reeds are half grown until the latter end of July, these birds frequent them in abundance, and their nests with eggs or young may be readily found: I have taken the young as late as the 13th of August. They continue about the reeds until the middle or end of this month, when I believe they migrate, with the exception of an occasional late-hatched bird.

The food of the reed-warbler principally consists of small spiral-shaped shell-snails, which occur in great plenty in reed-beds, often completely covering the lower part of the reed-stems; they also eat beetles, and a variety of small insects.

In ditches, where reeds grow thickly, and the sides have plenty of stunted thorn-bushes intermixed with brambles and rank grass, the reed and sedge-warblers* are close and sociable neighbours, and I have frequently found the nests of both species within half-a-dozen yards of each other. The reed-warbler's nest is suspended from the stems of the reeds, although the outer branches of the thorn-bushes are often entangled with them. The sedge-warbler's nest is always fixed in the low thorn-bushes, and out of many dozens that I have found, I have never met with one fixed to the reeds, unless a stray stem, growing through the bushes, has now and then been as it were accidentally intertwined, from its being placed on an outer branch, but even this very rarely happens. In other places where reeds have been scarce and not sufficiently thick to hide the nest, by the side of ditches and near gardens, I have found the nest of the reed-bird placed in closely-branched elder-trees.

The nest of the reed-warbler is often elegantly built, and generally fixed to three or four reed-stems. It is composed of slender blades

* Calamoherpe arundinacea.

of grass, interwoven with the reed-tops and the dry spongy substance which covers many of the marsh ditches; also dry duckweed, and here and there a long piece of sedge is wound securely around it; the lining is of the finer flowering stems of grass, intermixed with a little horse-hair. It is a deep and solid structure, so that the eggs cannot easily roll out; it is firmly fastened to the reeds in tide ditches and rivers, at the height of three or four feet from the water, but in still ditches often not more than a foot.

The eggs are generally five, rather larger than those of the sedge bird, and of a greenish tint, thickly blotched with darkish ash-colour at the large end, the smaller end being spotted with light brown; the markings are of different sizes, and sometimes vary in the same nest.

In windy weather, when wading through the reed-beds, I have seen nests, with both old and young in them, blown nearly to the surface of the water; but the birds fix their claws firmly to the sides of the nest, with their heads to windward, and thus ride as securely in their cradle as a sailor does in his cot or hammock.

The nest is rarely blown down, for when the men cut the reeds in winter they frequently find it firmly fixed to the stalks, and call it the "reed-sparrow's."

As soon as the young ones quit the nest, which they do early, they are very active, and nimbly hop up and down the reed-stems, it matters not which end uppermost; they are very tenacious in their grasp, and very noisy and clamorous for food. Both old and young, at this time, utter a screaming note, something similar to that of young starlings, with now and then a deep harsh "churr."

The naturalist will find the before-mentioned reedy ditches, closely margined with bushes and brambles, the most easy places to study the habits of the reed and sedge birds. Whenever I wish to become acquainted with these birds, I resort to the reedy beds and imitate the squeaking cries of the young in distress. The males of both species, if within hearing, directly fly to the place from whence the sounds proceed, and begin to sing stoutly; and it is curious that a stone thrown into the reeds or bushes, will often produce a similar effect. When I have found the nest of the reed-warbler with young, I have almost thrown the parent bird into fits by continuing those cries which they suppose to proceed from their little ones. The male bird will approach close to you in a bold and fearless manner, singing his merry varied song, which to me is discoursing "most eloquent music;" his throat, while singing, is greatly distended. The hen bird all the time utters a harsh screaming note, and anxiously shifts to and fro from the

nest; while the nestlings, filled with fear and wonder, are crouching with their heads close to the bottom of the nest and cocking up their tails. If you wish to take them you must be careful how you manage, for they will often bolt out of the nest with a scream, in different directions, the old birds vociferously calling them, and trying to get them to a place of safety. The young ones remain quiet in the places they have flown to, until their alarm is over and hunger compels them to call for food; you may then by patiently watching, and being directed by their call, as well as marking the place where the old birds feed them, secure one or more.

A young nestling that I took on the 29th of last June, would often turn himself completely round and round the perch of his cage, without letting go his hold; he began to record and warble his song as soon as he could feed, and when about seven weeks old would break out pretty loud. As with most nestling birds when learning, you can make out but little resemblance to their proper notes.

The reed-warbler's nest now and then receives a cuckoo's egg, as I find by my notes that on the 15th of June, 1834, when close to the New-cross canal, about four miles from London, I found a cuckoo's egg in each of two nests built among reeds, within sixty yards of each other. One of the nests had three eggs in it besides the cuckoo's; the reed-bird's eggs had been sat on about a week: the other nest had two fresh eggs besides the cuckoo's. From their being so near to each other, it is probable that the two cuckoo's eggs were laid by the same bird.

At the latter end of July, 1829, while reading in my garden, which adjoins a market-garden,* I was agreeably surprised to see a young cuckoo, nearly full grown, alight on the railings between the two, not more than a dozen yards from where I was sitting. Anxious to see what birds had reared this cuckoo I silently watched his movements, and had not waited more than a minute, when a reed-warbler flew to the cuckoo, who, crouching down with his belly close to the rail, and fluttering his wings, opened wide his orange-coloured mouth to receive the insect his foster-mother had brought him. This done, the reed-warbler flew away for a fresh supply of food. The difference in the size of the two birds was great; it was like a pigmy feeding a giant. while the reed-warbler was absent, the cuckoo shuffled along the rail and hopped upon a slender post to which it was nailed, and which projected about eight inches above the rail. The reed-warbler soon returned with more food, and alighted close to the cuckoo, but on the

* In the Blue-Anchor road, Bermondsey.

rail beneath him; she then began to stretch herself to the utmost to give him the food, but was unable to reach the cuckoo's mouth, who, like a simpleton, threw his head back, with his mouth wide open, as before. The reed-warbler, by no means at a loss, perched upon the cuckoo's broad back, who, still holding back his head, received in this singular way the morsel brought for him. I had a good view of these proceedings, being hidden from observation by a row of scarlet runners.

At first the young reed-warblers have their under parts of a tawny colour; the upper parts differ but little from the mature plumage: they have two black spots on the tongue. When about five or six weeks old the under parts change to a silvery white, and the upper parts assume much the same colour as in the adult bird.

These birds are loud, merry and untiring songsters; in the breeding season I have heard them sing at all hours of the night. A wild bird, which was stationed in some elder trees close to a mill-pond stream, the sides of which had a few reeds mixed with elder shrubs, and close to my house, generally commenced his song in the second week of May, and continued it until the latter end of July.

If kept in a cage and in good health, they sing all the winter, but are inclined to be mischievous, delighting in pecking other birds; the best way to prevent this is to keep them in a good-sized cage with a larger bird, such as a nightingale.

You may hear this bird singing in the season about two miles from London bridge, by the ditch-sides and mill-pond streams, at the back of the gardens in the Seven Islands, Rotherhithe, and along the Bermondsey level, as well as in a reed-bed at the back of China-hall, on the Deptford lower road; but they are not so numerous in these places now as they were about twelve years since, for the Greenwich rail-road stretches across some of their old haunts.

9, Townsend St., Old Kent Road, W. H. Thomas.
January 27, 1843.

Note on the occurrence of the Black Redstart near Penzance. Having recently obtained a specimen of the black redstart (*Phœnicura Tithys*) near Penzance, my attention was called to the fact of that bird being an occasional visitant to the west of Cornwall: and thinking the subject might possibly be an interesting one to some of the readers of 'The Zoologist,' I am induced to send you a few observations upon it.

The following captures of the black redstart have come to my knowledge. One was caught some years since at Lariggan, between Penzance and Newlyn, by some boys who were bird-catching in the winter; this is supposed to be a female, and is now in the collection of Mr. Rodd. A second example was shot near Marazion, in January, 1842, by Mr. Vingoe, naturalist of this town; this was a male, and is now in the Penzance Museum. A third specimen of this bird was shot also near Lariggan, in December, 1842; this was a female, and is now in the possession of Mr. Tuke, of York. A fourth example, which proved to be a male, was shot by myself near Marazion marsh, on the 8th of February, 1843.

Besides these captures, I have information of three of these birds having been seen in different localities near this place; and I have little doubt of the correctness of my informants, as they are not likely to have confounded them with females of the common redstart (*Phœnicura ruticilla*), that species having never, to my knowledge, been seen so far west as Penzance, though a few are said to occur in the east of Cornwall.

Neither of the male examples killed here has any black about the neck or breast, and are therefore, I suppose, both immature: or does this bird always lose its black garb in the winter, as some here seem to suspect? Information on this point would be very acceptable, as no ornithologists, whose works I have seen, notice it, neither do they say where these birds pass the winter; it seems probable, from all the examples seen and procured here having occurred in the winter, that many at least pass that period not far from our shores.

The bird which I saw myself was flying about in the haunts of the stonechat (*Saxicola rubicola*), and appeared to me, in its general action, and particularly in perching on the summit of every eminence, to exhibit more of the habits of that species, than its congener the common redstart does. — *Alfred Greenwood; Penzance, February* 18, 1843.

Note on the late departure of the Swallow in 1842. I have received and perused the only two numbers of 'The Zoologist' yet out: I approve the plan of the work and mean to continue it. There is ample room and even call for a work of the kind. Is it worth recording in a corner of 'The Zoologist,' that I observed a single swallow (*Hirundo rustica*), on the 8th of December, sporting backwards and forwards under the cliffs below Dover castle, between 2 and 3 in the afternoon? It was a cold raw day, calm and without sun; wind N.E. by N. I watched him for a good while, and looked

for him on the following day, but he was gone. This is the latest date at which I ever myself saw any of the swallow tribe. I take it, they come down to this ancient cinque-port, and, like so many other travellers, make a very short sojourn previously to their departure for foreign climes; for I recollect, in the year 1831, observing two swifts at Dover, a little before dusk on the evening of September the 10th. They were not to be seen the next day, nor had I seen any previously since the 14th of August, as recorded in the 'Magazine of Natural History.'—*W. T. Bree; Allesley Rectory, near Coventry, Feb.* 8, 1843.

Note on the late departure of the Swallow in 1841. As I was walking along the Beverley road on the 12th of November, 1841, at noon, the sun shining unusually warm at the time, I was surprised to hear overhead the well-known but pleasing twitter of the common swallow (*Hirundo rustica*); and looking towards the direction from which the sounds came, I observed two of the above-named birds flying about, and apparently enjoying themselves as if it were summer; being most probably allured from their hybernating places by the warmth of the weather, and the abundance of small flies which were hovering about. In the morning there had been a keen frost, and the weather for the next week was unusually severe for the season, the ground being covered with snow to the depth of four or five inches. The usual time for the reappearance of the swallow in this neighbourhood is generally about the 16th of April, sooner or later, according to the state of the weather.—*Geo. Norman; Hull, February* 9, 1843.

Note on Water-birds occurring at Kingsbury reservoir. I have sent a rough list of water-birds, including the waders, obtained or seen near Kingsbury reservoir, a large sheet of water about five miles north of London, on the Edgeware road, which has been made about eight years. Specimens of those marked thus * are in my collection; and I have not put one in the list that I am not sure of its having occurred.

*Golden Plover, *Charadrius pluvialis*
*Ring Dotterel, *Charadrius Hiaticula*
*Lapwing or Peewit, *Vanellus cristatus*
Oyster-catcher, *Hæmatopus Ostralegus*
*Common Heron, *Ardea cinerea*
Bittern, *Botaurus stellaris*
*Little Bittern, *Botaurus minutus*
Night Heron, *Nycticorax europæus*
*Curlew, *Numenius arquata*
*Solitary Snipe, *Scolopax major*
*Common Snipe, *Scolopax Gallinago*
*Jack Snipe, *Scolopax Gallinula*
Black-tailed Godwit, *Limosa melanura*
*Bar-tailed Godwit, *Limosa rufa*
Ruff, *Machetes pugnax*
*Pigmy Curlew, *Tringa subarquata*
*Dunlin, *Tringa alpina* [*minckii*
*Temminck's Sandpiper, *Tringa Tem-*
*Little Stint, *Tringa minuta*
*Grey Phalarope, *Phalaropus lobatus*
*Greenshank, *Totanus glottis*
Dusky or spotted Redshank, *Tot. fuscus*
*Green Sandpiper, *Totanus ocropus*
*Wood Sandpiper, *Totanus glareola*
*Common Sandpiper, *Totanus hypoleucos*
*Water Rail, *Rallus aquaticus*

*Land Rail, *Crex pratensis*
*Spotted Rail, *Crex Porzana*
*Moor Hen, *Gallinula chloropus*
*Coot, *Fulica atra*
*Tippet Grebe, *Podiceps cristatus*
Eared Grebe, *Podiceps auritus*
*Dabchick, *Podiceps minor*
*Black-throated Diver, *Colymbus arcticus*, a young bird
*Pomarine Gull, *Lestris striatus*, young
*Common Gull, *Larus canus*
Lesser black-backed Gull, *Larus fuscus*
Black-headed Gull, *Chroicocephalus ridibundus*
*Arctic Tern, *Sterna arctica*
*Common Tern, *Sterna marina*
*Little Tern, *Sterna minuta*
*Black Tern, *Sterna nigra*
Goosander, *Mergus Merganser*
Smew, *Mergus albellus*
*Pochard, *Fuligula ferina*
Scaup Duck, *Fuligula Gesneri*
*Tufted Duck, *Fuligula cristata*
*Golden Eye, *Clangula chrysophthalmos*
*Widgeon, *Mareca Penelope*
*Teal, *Querquedula Crecca*
Pintail, *Dafila acuta*
*Gadwall, *Chauliodus Strepera*
Shoveller, *Rhynchaspis clypeata*
*Wild Duck, *Anas Boschas*
One or other of the grey Geese has occurred several times, but I have not been able to get hold of one to examine
Brent Goose, *Anser Brenta*
Wild Swan, *Cygnus ferus*

—*Fred. Bond; Kingsbury, February*, 1843.

Note on the Migration of Birds. The last season has been remarkable for the irregularity attending the appearance of our birds of passage. In this neighbourhood the redstart was unusually abundant; the whinchat I never saw at all. In other seasons whilst the latter are abundant, the redstarts are few in number. Though daily looking out anxiously for the swallows, they did not make their appearance till the 30th of April: they disappeared from this part on the 12th of October, but in the sheltered streets of Bath I saw them till the 30th. I remember seeing one in Jersey on the 20th of November, 1840, and thinking it late even there; but my friend Mr. George Waring tells me that he saw three at Falmouth on the 5th of December of the last year. Mr. Jesse tells us that the martins stay much later than the swallows; the reverse is, however, the case, so far as my observations have gone. — *William C. Hewitson; Bristol, February*, 1843.

Enquiry respecting White's Thrush. I would beg to ask whether the rare thrush called "White's" is an accidental variety, or a mule, or a wanderer from its family into England? And if the latter, where are they natives, and what are the sexual marks? My reason for asking these questions is, that I have now, and have had for many weeks past, a bird of this description daily appearing on my lawn in front of my study window. I at first supposed it might be a hen blackbird, being quite as large, with a similar tail; as dark in colour, but with more of a chesnut brown on the breast. It is not a blackbird, for it

has all the action and habits of the thrush. The cock blackbird chases it; and in return *it* chases the cock song-thrush, which it exceeds in size, and differs particularly in the form and length of the tail, as well as the colour. It is in all respects like White's thrush, but, as I said before, of a darker hue.—*E. A. H.*

[The so-called White's Thrush, (*Oreocincla Whitei* of Gould), is only an accidental straggler into Europe: it differs totally from our British species, in having a longer beak and other marks of distinction. I have no doubt your correspondent's bird is a hen blackbird, perhaps rather lighter coloured than usual.—*H. Doubleday.*]

Note on the occurrence of the Herring Gull at Worcester. A fine specimen (female) of the herring gull (*Larus argentatus*, Brunn.), was shot last week by John Smith, Esq., on the moat in front of his house, at Lower Wick, on the banks of the Teme near this city. This bird is said to be the predominant species on the western coast to which we are nearest, nevertheless so far inland such visitants are rare, unless in very rough weather, when occasionally some of this tribe are driven here by the violence of the gales on the sea-coast.—*Geo. Reece, Foregate St., Worcester, February* 28, 1843.

Note on a Grey Parrot.

"A lady in the town of Chepstow has been in possession of a grey parrot for the last twenty-one years. When she became possessed of it she supposed it was two or three years old; during the whole of this period it produced no eggs, but to her great surprise, from the 9th of January to the 12th of February inst., the bird has laid *seven eggs.*"—*Monmouthshire Merlin, February* 25, 1843.

Note on Birds in April.—

"About the 9th the willow-wren is heard, and the following birds — tree-pipit, wryneck, yellow wagtail, turtle-dove, quail, swallow, cuckoo, common and lesser whitethroat, reed and sedge warbler, whinchat and nightingale — continue to arrive in this succession till the 16th. On or about the 20th the wood-wren appears; the short-eared owl and common shoveller depart. From the 20th to the end, the swift and garden warbler appear."—*Van Voorst's Naturalists' Almanack.*

Reptiles.

Note on the Sand Lizard. In the month of March, 1840, I received a specimen of the sand lizard (*Lacerta agilis*) from Poole, in Dorsetshire, a few remarks on which, in confinement, will perhaps be acceptable. On receiving it I constructed a box 4½ inches deep, and 16 inches square, the top of which was glazed, and the box lined with green baize. In this box were placed two troughs, one containing water and the other sand, both of which it seems to delight in, bathing in and drinking the former, and lying in the latter basking in

the sun, with its belly flattened as much as possible; a piece of heath was also placed in the box, about which it was very fond of climbing. During the first three weeks it was fed entirely on flies, which it devoured greedily after the first three days' confinement; always rejecting their heads and wings: however, finding a difficulty in procuring a sufficient quantity of flies, I obtained some meal-worms, to which it soon became very partial. The manner of seizing them was thus; creeping quietly up to the worm it drew back its head, leaning it on one side for an instant, and then darting it forward with its whole force, it seized the victim by the middle, and held it so until it ceased struggling, when it ate it very slowly. After a short time it would take the meal-worms from my hand, but would never touch dead ones. Every morning it had a swim in a basin of water; this I considered conducive to its health: it continued to do so until it ceased eating, four or five days previously to becoming torpid.

On the 28th of July of the same year I received another specimen from the same locality; and I may here mention that I have diligently searched other heaths, but without success. The change of the skin took place about every six weeks, and was effected by rubbing it off against the heath, not after the manner of the serpent, by turning it off, but the skin, splitting along the sides, broke off in several pieces, the skin of the legs separate from any part of the body; the skin of the tail split the whole length underneath, and broke off in pieces of two or three whorls each. I could never find the skin of the head, neither do I think it was ever shed: I am convinced that it never was blind, and shedding the skin did not appear to occasion it any inconvenience whatever.

About the first week in October both my lizards began to refuse their food, which induced me to leave off bathing them, and they retreated between the baize and the side of the box on the 13th of the same month; I saw nothing more of them during the winter. On the 12th of February they were evidently arousing, their eyes being a little open; the next day they were very lively, but through neglect in feeding them they both died in the ensuing month.

They never attempted to bite, as did a specimen of the viviparous lizard (*Zootoca vivipara*) which was confined with them, and after the first three or four days they were very gentle; they were not nearly so timid as the Zootoca, neither were they so agile; if taken in the hand they would immediately crawl up the sleeve. The action of drinking was like that of a dog, but more slowly performed. The tongue was never used in catching their food; sometimes they would get too near

it, and when they darted at it would go beyond the mark; in such cases they continued trying until the worm was at the proper distance. The length of one was five inches, of the other six; the largest one had the brightest colours.— *W. Thompson; London, January*, 1843.

[The first description of the sand-lizard (*Lacerta agilis*, Linn.) as a British animal, occurs in the sixteenth volume of the 'Transactions of the Linnean Society,' by the Rev. Revett Shepherd. He follows Merrett and Ray in giving it the specific name of anguiformis. Mr. Bell, in his 'British Reptiles,' restores the Linnean name to this beautiful and comparatively rare species, and refers our common British lizard to the Zootoca vivipara of Wagler, the Lacerta vivipara of Jacquin.—*Ed.*]

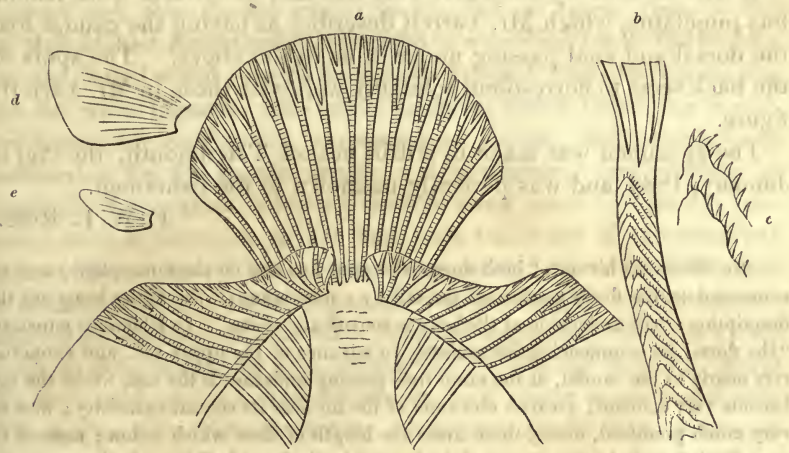
Description of Muller's Top-knot (Rhombus hirtus, *Mull.*), *taken from a fresh specimen.* By F. W. L. Ross, Esq.*

Muller's Top-knot, (*Rhombus hirtus*).

Length 6½ inches, greatest depth 4½; length of the head one third the entire length of the fish, tail not included. The dorsal fin rises just above the upper lip, and is continued *under the caudal*, which is free: the first rays are about one third the length of the longest; they gradually increase in length to about four fifths of their extent, where they attain their greatest length, then decrease to the end under the tail, the last six rays being short and delicate. The rays are strong

* Communicated by G. R. Gray, Esq.

and broad, wreathed as a cable, and thickly set on each ridge with minute sharp spines, which point towards the tail, and are bifurcate at their extremities. The upper pectoral fin is 9 lines in length, and rounded. The ventral fin is united to the anal, the union being marked by an indenture in the membrane: the latter passes *under the tail* in the same manner as the dorsal, and its rays are armed in the same way. The ventral fin is six-rayed. The tail is short, free and rounded, its rays are divided at about a third of their length, and then subdivided, each terminating in eight delicate rays, which are rough like



Details of Muller's Top-knot. *a*. Portion of the under side, showing the termination of the dorsal and anal fins beneath the caudal. *b*. One of the fin-rays magnified. *c*. Spines of fin-ray. *d*. Upper pectoral fin, natural size. *e*. Lower pectoral fin, natural size.

the others. The mouth is nearly vertical, forming an angle of about 9 or 10 degrees. Mr. Yarrell observes that it is small, but in my specimen it is capable of being extended to one inch by three quarters: the teeth are small, and numerous in both jaws, with a cluster of small ones on the vomer: when the mouth is extended the membranes are particularly transparent. The branchiostegous membrane is also remarkably clear; rays 3+4. The whole of the upper surface, including the eye-lids, cheeks and body, is rough, being covered with small scales, denticulated on their edges, which appear to be turned up: the head is rougher than the body. The upper eye is larger than the under one. The lateral line rises over the upper angle of the opercu-

lum, and takes a curve, passing with a slight deflection over the pectoral fin, thence straight to the middle of the tail. The colour of the whole upper surface is a dark reddish brown, mottled with rather large black-brown spots and irregular smaller markings, which extend over the fins. The pectoral fin on the under side much smaller than the upper, 4½ lines in length, the under side perfectly smooth, and when alive of a pure white, which changes to a pinkish white after death, with a silvery spot on the gill-covers; the colour of the back also fades considerably.

No. of fin-rays.—D. 100. P. 12. V. 6. A. 5. C. 15.

It will be seen by the figure that this fish is distinct from Rhombus punctatus, which Mr. Yarrell describes as having the caudal free, the dorsal and anal passing under it, as in the above. The spots on the back seem to correspond tolerably well with those in Mr. Yarrell's figure.

The specimen was taken in a drift net off Teignmouth, the 2nd of January, 1843, and was perfectly unknown to the fishermen.

F. W. L. Ross.

[In Rhombus hirtus* "both dorsal and anal fins end on the same plane, and are connected to the fleshy portion of the tail by a membrane;" the figure bears out this description: "the under side of the body is smooth and white." In Rhombus punctatus "the dorsal fin commencing immediately in advance of the upper eye, and extending very nearly to the caudal, at the same time passing underneath the tail, where the rays become very delicate; greatest elevation of the fin near its ventral extremity; first ray very much produced, nearly three times the length of those which follow; most of the rays divided at their tips; some of the last in the fin branched from the bottom: anal fin commencing in a line with the posterior line of the preopercle, answering to the dorsal and terminating in the same manner beneath the tail," &c., "both sides of the body, but more especially the upper, extremely rough."† In a note to the editor Mr. Yarrell observes "there is no really specific distinction between the Rhombus of your correspondent and that which I have figured; the difference in the termination of the dorsal and anal fins is obvious on the white side only, which I have not figured. My description might have been more clear on this point."—*Ed.*]

Note on the voracity and carnivorous propensity of the Eel. On the 21st of May, 1829, I was witness to a scene of no ordinary occurrence. Whilst walking near the bank of the principal water in Pilling, in the parish of Garstang, Lancashire, I beheld opposite to me a large rat, apparently struggling and evidently much alarmed, in a

* Brit. Fishes, ii. 336, 2nd ed. † Id. 340.

hole a little elevated above, and near to, the edge of the water. When the rat first saw me it attempted to return into its hole, but was evidently opposed, and at length driven back by some foe then invisible to me: for immediately afterwards it began to struggle with renewed energy, and eventually extricated itself from the hole, when to my great surprize it dragged up after it an eel, about three quarters of a pound in weight, and which appeared to me to have the greatest portion of the rat's tail in its mouth. As soon as the head of the eel was dragged about six inches out of the hole, it liberated the rat, but whether through fear of me, or being suddenly and unexpectedly raised into a foreign element, I cannot, of course, speak decisively. I may however add, that the eel was so far dragged on *terra firma* by the rat, that it had considerable difficulty in wriggling itself back again into the hole, which, on examination, I found had communication with the water beneath. The following facts, which I also beg to add, corroborate the carnivorous propensity of the eel, and especially its predilection for the mouse family. A gentleman, now residing at Blackpoôl, Lancashire, informed me that a few years ago he was presented with a large eel, which had been taken out of the principal drain of Marton Meer; on opening the monster he found a full-grown rat in the stomach. Several persons also residing in my own immediate neighbourhood, who make a practice of placing night lines with hooks, in deep water, for eels, always tell me that the most successful bait for a large eel is a skinned mouse, or a young sparrow stripped of its feathers. — *J. D. Banister; Garstang, Lancashire, February* 14, 1843.

Notes on Lepidopterous Insects. By Edward Doubleday, Esq., F.L.S., Assistant in the Zoological Department of the British Museum.

About a year since while looking over the collection of Lepidoptera sent from Silhet by Mr. Stainsforth, and now in my brother's possession, I was delighted by observing what seemed to me a new species of Leptocircus; but further investigation made me suspect that this would turn out to be the true Papilio Curius of Fabricius, and consequently that the species now considered to be that insect, and on which the genus Leptocircus was founded, would, for the future, have to bear the name of Meges bestowed on it by Zinken, who, by the bye, was evidently quite unsuspicious of his insect having

been described by Godart, or of Fabricius having described any species so nearly allied to it as his P. Curius. By an examination of the original specimen of P. Curius in the Banksian cabinet, which, however, is *not* labelled in the hand-writing of Fabricius; and also of Jones's drawing from which Donovan's figure was taken, my suspicion was turned to certainty; and it only remains for me to endeavour to point out to other entomologists the characters by which the two species may be distinguished.

The Fabrician description* is alone quite sufficient to point out one decided character of the true Curius, but does not indicate all the distinctions between the two species; and I shall therefore give a more detailed account of them, using the Fabrician name for the Northern Indian species, to which of right it belongs, and Zinken's name, Meges, for the Javanese species commonly known as L. Curius.

In L. Curius the band which crosses the middle of the anterior wing is externally curved, and of an opaque white towards the base of the wing, but the outer half is perfectly hyaline, with the nervures black. In the white portion of the band the nervures are concolorous, except the subcostal, which is black. The hyaline space crossed by the black nervures which occupies the outer portion of these wings, is smaller than in L. Meges, the black border being broader, especially at the apex, where it leaves only a small oval hyaline spot between the last branches of the subcostal nervure. The band of the posterior wings is narrower than that of the anterior, and of the same opaque white as that portion of the latter to which it corresponds.

In L. Meges, the band of the anterior wings has its margins more nearly parallel, is of a glaucous hue, and has all the nervures concolorous; that of the posterior is rather broader and of the same colour, and whilst in L. Curius it is the inner margin of this band which most nearly coincides with that of the anterior wings, in L. Meges it is just the reverse. The anal angle of the posterior wings and the base of the tails are less powdered with whitish in L. Meges than in L. Curius.

The accompanying woodcuts very nearly express the characters which distinguish the two species, though perhaps there is rather too marked a difference in the form of the posterior wings, which however are much more indented in L. Curius than in L. Meges. It will be needless to give a formal description of the two species, I shall there-

* "Alis caudatis, concoloribus, atris; anticis fasciis *duabus hyalinis;* posticis unicâ *albâ:* and it is rather singular to read this below Godart's specific character — "alis subconcoloribus, nigris, *fasciâ communi glaucâ:* anticis ante apicem hyalinis."

iore merely give the synonymes, leaving the figures to speak for themselves.

b. Leptocircus Meges. *a.* Leptocircus Curius.

Genus.—LEPTOCIRCUS.

Lept. Curius, (fig. *a*). Papilio Curius, *Fab. Mant. Ins.* ii. 9, No. 71; *Fab. Ent. Syst. Enc.* iii. pars i. 28, No. 81; *Donov. Ins. of India*, pt. iv. pl. 4, fig. 4.

Inhabits Siam (according to Fabricius) and Silhet.

In the cabinets of the British Museum, the Linnean Society, and Mr. H. Doubleday.

Lept. Meges, (fig. *b*). Papilio Meges, *Zinken, Nova Acta*, xv. pt. 1, 161. Iphiclides Curius, *Hubner, Ziet.* fig. 645 and 646. Erycina Curius, *Godt. Encyc. Supp.* 827. Leptocircus Curius, *Swainson, Zool. Illust. 2nd series*, pl. 106; *Boisduval, Species Gener.* i. 381.

Inhabits Java, (Siam, Boisd.)

In the cabinet of the British Museum.

I have before said that Zinken evidently did not know that his insect was the Erycina Curius of Godart, but imagined it to be a perfectly new insect. This is the more probable, as many of the insects described in this paper belong to old and well-known species, to which he has given new names.

London, February, 1843. EDWARD DOUBLEDAY.

Note on Lepidopterous Insects captured at Manchester. With the assistance of a few friends I am enabled to send you a list of the Lepidoptera that have been captured within fifteen miles of Manchester, and hope other entomologists will favor us with a list of their Fauna. That local lists are highly interesting and useful to an entomologist, needs no proof.

The diurnal Lepidoptera, on the average, are very rare; such species as Gonepteryx Rhamni, Argynnis Paphia, Arg. Adippe, Vanessa C-album, Van. Polychloros, Thecla Quercûs, Polyommatus Alsus and Pol. Argiolus, so common a little further south, are here seldom seen, but why it is so I cannot account for. Hipparchia Davus, met with in abundance on the mosses, is very variable; Hip. Typhon and Hip. Polydama are varieties of this insect. Polyommatus Argus is local on Chat-moss, and is also variable, some specimens approaching very near to Pol. Agestis. Again, Bupalus favillacearius is scarcely half the size, and considerably darker than those captured in Hampshire, for specimens of which I am indebted to the kindness of Mr. Dale of Dorset: the same is the case with several other insects taken here.

The mosses are the favourite localities with us entomologists; some of our rarest insects have been captured on them. Ashton-moss is cultivated, and White-moss is in process; but fortunately for the "brethren of the net," many years must elapse ere such extensive tracts as Chat and Carrington are drained. — *Robert S. Edleston; Cheetham, Manchester, January* 17, 1843.

[We doubt the expediency of printing lists of insects unaccompanied by notes, because the majority of the species thus enumerated occur in every county of the United Kingdom, and the lists therefore want to be carefully looked through, and the universally distributed species struck out, before they can be made useful. Mr. Edleston's list contains a number of rarities, for instance, Deilephila Galii and Deil. Livornica, a few words about which would be more interesting than a column of such names as Pontia Brassicæ, Rapæ, Napi, &c. In this however our only desire is to consult the wishes of our correspondents, and we hope those distinguished entomologists whose

names already appear in our pages, will favour us with opinions on the subject of publishing general lists. To Mr. Edleston our best thanks are due for the trouble he has taken in preparing the admirable list now before us.—*Ed.*]

Note on the occurrence of certain Butterflies near Dover. As another instance of the mildness of the earlier part of the present winter, or, if you will, of the climate in that neighbourhood, I may remark that on the 15th of December last I saw Vanessa Urticæ within a mile of Dover, flying about as gay and brisk as if it had been Midsummer, instead of almost mid-winter; so much so indeed, that an active youth who was with me, was unable to capture the specimen, although he pursued it with that intention for a considerable distance.

Now that I am on the subject of butterflies, I must tell you that Mr. Le Plastrier of Dover, captured last summer, in that vicinity, two pairs of the rare Pieris (Pontia or Mancipium or whatever its right name is) Daplidice, or Bath white. One of these fortunately laid some eggs after it was captured; and from these Mr. Le Plastrier reared the caterpillars, which he fed on the wild mignonette (Reseda lutea), and at the present time he has four of them in the chrysalis state. The chrysalis, to my eye at least, a good deal resembles that of some of the Vanessæ, were it not that, unlike them, it is fastened by a thread round the middle. At what time will the butterflies come forth? I expect in May. Mr. Le Plastrier's specimens were taken, I think, the end of July or early in August, and if so, it should seem there must be two broods in the season. The same intelligent collector captured likewise, last summer, many specimens (five or six pairs or more) of Colias Hyale near Dover. The summer of 1842 was one of the finest we have had for many years, and therefore favourable to the production of insects, as we may conclude; but what strikes me as strange, is, that the same season which produced C. Hyale in more than usual abundance, should not have been equally productive of the allied species, C. Edusa. Mr. Le Plastrier informs me that they "had no clouded yellows last summer about Dover;" where, in certain seasons (as for instance, in 1831) I know they are to be seen in considerable plenty. How much in the dark are we about the periodical appearance of insects! And how is our reason baffled in attempting to account for the phenomena! If any of the above notes are thought at all worth a place in 'The Zoologist,' pray make what use of them you like.—*W. T. Bree; Allesley Rectory, near Coventry, Feb.* 8, 1843.

Note on a Glass Bee-hive of a singular construction. The extracts from Mr. Cotton's most amusing 'Bee-Book' (Zool. 22), reminded me of a glass hive which a friend of mine in Dorsetshire had many years

ago, which afforded him much amusement. It was constructed in the form of a cross, each limb being I suppose about eight inches wide, and a foot high, formed of parallel pieces of glass, about an inch and a half, or probably a little more, distant from each other, so as to admit of one piece of comb, with room enough on each side for the bees to work. My friend's breakfast-table was a fixture close to the window, and continuous with the window-sill, and upon this table the glass hive was firmly fixed, and a passage was formed from outside the window, through the sill, and through the substance of the table, straight to the glass hive, into which it opened at the bottom, of course without any opening into the room. Thus the bees made their way from the open air through the little passage into the hive, having but a short way to travel, as the hive was as near to the window as it could conveniently be placed. The cross form gave several advantages; it afforded a larger space for the bees to work in, and a larger field for observation, and it rendered the hive much more strong and firm. A pasteboard cover of the same form was made to go over it, so that the bees were always in darkness, excepting when uncovered for the purpose of examining them; and I think there were some means adopted for the ventilation of the hive, but of this I am not certain. Thus my friend, who was a lone bachelor, had always at his breakfast table a more delightful, rational and instructive companion, than either the newspaper or "the last new novel." As I write from recollection of what I saw about thirty years ago, I may be in error as to some of my details; but I am sure not in any important particular.—*Thomas Bell; New Broad St., January* 23, 1843.

Note on Coleopterous Insects frequenting damp places. During the past year I paid particular attention to the marshes, banks of streams, rivers and pools in our neighbourhood, in my researches after Coleopterous insects; and from the success I met with, I am inclined to think such localities are not examined with the industry they deserve. Muddy banks of large pools, mingled with half-submerged moss, aquatic shrubs, decayed reeds, and other rejectamenta, from which arise clumps of taller plants, will amply repay the somewhat unpleasant labour of investigation. Many a long day, in sunshine and in shower, has seen me wading in those miry paradises, in the praiseworthy endeavour to effect my little towards the advancement of our favourite science; and my labours were rewarded with many of those insect gems whose shining coats "the richest hues adorn."

In the early part of spring, from March till June, but chiefly during the month of April, these places are the only haunts of some of our

finest Geodephagous beetles; whilst whole genera of other less ornamented kinds swarm there, although rare in other localities. The heated banks of damp moss left by the retreating waters of these pools, glitter with a profusion of bright creatures, whose forms, motions and economy the entomologist will never observe in any other situation.

Towards June the profusion of Geodephagous Coleoptera declines, and gives place to a no less abundance of other widely different tribes of the same order. The rushes, water-lilies, potamogetons &c. swarm with many species of herbivorous genera, such as Donacia, Cyphon, Atopa, Campylus, Crioceris, Haltica, Cassida and others.

I subjoin the names of some of the insects taken in such situations during the last season, in the neighbourhood of Leicester and Charnwood Forest. I have affixed an asterisk to those which were of rare occurrence.

Chlænius nigricornis and melanocornis* (*Zeigler*): the Chlænii we used to find submerged in sheets of moss, far in the water; Agonum marginatum (*F.*), viduum, mœstum, afrum,* consimile,* Simpsoni* (*Spence*), gracile, piceum and picipes; A. marginatum was abundant on the sandy parts of the banks, such being apparently its favourite haunts; my specimens of A. afrum are beautifully distinct from those of mœstum, to which it is so nearly allied: Oodes helopioides: Blethisa multipunctata; this insect was abundant in April, and is more partial to water than any of its congeners, its most usual abode being in the roots and lower part of the stem of the Iris, fairly surrounded by the water, from which, on being disturbed, it scampered off in all directions in flocks of a dozen at a time: Elaphrus uliginosus,* cupreus and riparius, Curtonotus piceus,* Peryphus nitidulus (*Marsh*), Notaphus undulatus and ustulatus, Leistus rufescens, Atopa cervina, Cyphon testaceus, Heterocerus flexuosus, Parnus impressus (*Curtis*), Hypolithus riparius, Campylus linearis, Donacia crassipes, on the water-lily in June; D. cincta on various species of Potamogeton in August; D. dentata on Sagittaria sagittifolia in July; D. Proteus (*Kunzé*), linearis and simplex, common on rushes; D. rustica, nigra and Menyanthidis, on Iris Pseudacorus in June; D. Lemnæ, Sagittariæ and Typhæ: Cassida obsoleta (*Dejean*), on wild mint. — *Henry Walter Bates; Queen St., Leicester, January* 3, 1843.

Note on the occurrence of certain Coleopterous Insects at Launceston, Cornwall. I submit to your inspection the following list of the Coleoptera, which, after an accurate observation for the last two or three years, I have found more particularly to inhabit the neighbourhood of Launceston. As the Natural History of Cornwall has been

comparatively but little attended to, it may not prove unacceptable to many of your readers.

Chlænius nigricornis	Apoderus Avellanæ	Rhagium Inquisitor
Rhyzophagus rufus	Hylurgus piniperda	bifasciatum
Elater bipustulatus	Hypera punctata	Strangalia elongata
Aplotarsus longicollis	Rumicis	Luperus rufipes
Mycetocharus fusca	Pogonocherus hispidus	Altica Helxines
Throscus dermestoides	Saperda lævis	Chrysomela Banksii
Aphodius erraticus	Leptura apicalis	hœmoptera
Byrrhus sericeus	melanura	Cassida equestris
Rhinusa tricolor	Pachyta 8-maculata	Helops striatus

I ought perhaps to state that in this short catalogue I have admitted only those species which I have observed to be more particularly abundant in the neighbourhood. A single specimen of Callidium variabile was also taken, but it is the only instance of which I have heard. — *Vernon Wollaston; Jesus College, Cambridge, January* 5, 1843.

Note on captures of Coleopterous Insects near Cambridge, in December, 1842, *and January*, 1843. Within the last six weeks the following Coleoptera, amongst many others, have been brought to me from the fens. Some of them have occurred in immense numbers, of these Thanasimus formicarius, Panagæus crux-major and Opilus mollis ought to be more particularly mentioned.

Lamprias chlorocephalus	Thanasimus formicarius	Hylurgus piniperda
Leistus spinibarbis	Opilus mollis	Bruchus Pisi
Panagæus crux-major	Anobium castaneum	Dorytomus pectoralis
Colymbetes guttatus	tessellatum	Saperda oculata
Oiceoptoma sinuata	Hylesinus Fraxini	

Vernon Wollaston.

Note on the Larva of Cis Boleti. The larva is white, shining, semitransparent, cylindrical, longer and more slender than the perfect insect, but much resembles it in its movements, having the same habits and dwelling. The body is composed of thirteen segments, the first or the head is light brown, the eyes are like two black specks, the jaws and mouth are dark brown. The three following segments each bear a pair of short legs; the second or the prothorax is as large again as any of the following, which are nearly equal in size. The twelfth and thirteenth segments are pale brown above, and the last is armed with two dark brown spines, bending upward. — *Francis Walker; Southgate, January*, 1843.

Note on the capture of Coleopterous Insects during a flood. Although summer is the usual season for entomological excursions, every insect-hunter knows that if he is industrious much may be added to

his collection during the months of winter. It is of an excursion of this kind during the Christmas holidays that I am about to write. I was spending mine at York; the season had been unusually severe, with much snow, and being succeeded by mild weather, a rapid thaw was produced: this in the level round York soon caused a widely extended flood. Mr. Henry Baines, who is now the subcurator of the Yorkshire Philosophical Society, and myself, having hired a boat for the purpose, set out, our intention being to procure some of the rejectamenta brought down by the river. We were soon on a waste of waters, nothing being visible over a wide expanse, except the tops of the hedge-rows and a few wild-ducks, which took care to keep out of the range of our guns, with which we were also provided. We had a regular steeple-chase, and had often to put our boat to its speed to avoid sticking in the hedges which we topped.

After a long and novel row we found a large quantity of rejectamenta, which the eddying stream of the river had forced out of the current into a corner. It was composed of very small bits of stick, straw and grass, and we could see, as we filled it into a sack, that it was perfectly alive with beetles. We left it till the following day to allow the water to drain off; and though we had seen something of the multitude of insects the day before, we were not prepared for the sight that awaited us next morning. The outside of the poke was covered many deep with beetles which had forced their way through the sackcloth. They were in tens of thousands, and when swept off filled a large basin. The inside was alike swarming with life, and a large portion of its contents—and it held two or three bushels—was composed of Coleoptera, showing how vast—how enormous must be the waste of life during a widely extended flood. Amongst such myriads we expected to secure some good things, but in these our expectations we were disappointed; they were limited to a few genera—Haltica, Apion, Stenus, and hosts of Staphylinidæ. We had however the satisfaction of thinking that we had more than atoned for all the insect murders we had previously committed, by now rescuing so many insect lives from drowning.—*W. C. Hewitson; Bristol, Feb.* 1843.

Description of several Species of the Genus Phyllium.

By George Robert Gray, Esq.

Having examined various specimens of those interesting and curious insects denominated walking leaves (*Phyllium*, Latreille) through

the kindness of the Rev. F. W. Hope, and by means of the collection of the British Museum, I am induced to call the attention of entomologists to them. In the time of Linnæus only one species was known as the Mantis siccifolium, which is figured by Rösel. And it was the general opinion of authors long after that great man's time, that there existed but one species of these remarkable insects, until Stoll gave many figures of them, one of which he considered to differ in some points, and gave to it the name of Phasma chlorophyllium. The general opinion having been thus broken in upon, other species have since been added. M. Serville has named two species in his work on Orthoptera; and I ventured to increase the number in my 'Synopsis of Phasmidæ,' by three additional species: while M. Dehaan has described one and figured two, under what I consider incorrect names. In the present notice of species five new ones are added, thus forming a synopsis of thirteen species of these singular insects, which are easily distinguishable by the marginal form of the abdomen, and of the anterior femora.

These extraordinarily formed insects were, at one time, supposed to partake both of insect and vegetable life; and not only has the perfect insect such similarity to portions of vegetables, but even their eggs might at first sight be mistaken for the deeply ribbed fruits of various umbelliferous plants. The insects are mostly peculiar to the continent of India and its isles.

Genus.—Phyllium.

Division a.—*No dilation of the outer margin of the anterior femora.*

Phyllium Geryon. Female: abdomen with the first segment narrow, but widening to the middle of the third, from thence gradually decreasing to the tip; thus forming an oblong diamond-shaped abdomen. Length of body 2 inches 3 lines. The form of the anterior femur is shown at fig *a*, p. 121. *Phyllium siccifolium, nymph*, Dehaan, Verd. over de Nat. Gesch. pl. xv. f. 7.

Inhabits the Philippine Islands. In the cabinet of Brit. Museum.

Division b.—*The outer dilation of the anterior femora semi-oval and the margin entire.*

Phyllium siccifolium (L.), Latr. *Male and female:* abdomen broadest across the middle of third segment, narrowing gradually towards the apex of the sixth, and then suddenly to the tip of the body. Femora of the fore legs dilated; the inner dilation has the margin inwardly entire and outwardly dilated and rounded;

the outer dilation narrow, semi-oval and entire (see fig. *b*), p. 121. Length of body 3 inches 7 lines, breadth 1 inch 4 lines. *Mantis siccifolium*, L.; Rosel, Ins. xi. pl. 17, f. 4, 5; Donov. Ins. of Ind. pl. (lower figure); Cuv. Reg. An. Ins. pl. 79, 3rd edit.

Inhabits ——? In the collection of the Rev. F. W. Hope.

I may observe that Dumeril's figure is rather shorter and much broader than the above measurement; this agrees in some measure with the figure in Shaw's Nat. Misc. pl. 119. Stoll's figure 25 B, and Donovan's upper figure (both pupæ) are shorter; the former measures 2 inches 5 lines and the latter 2 inches 3 lines. Stoll's figures 24, a male, 26, a female, and 25 C, a pupa, are much longer than any of the preceding figures referred to, and may probably prove a distinct species, their length being respectively 2 inches 3 lines, 4 inches 2 lines and 3 inches 6 lines: they are stated to be from Amboina, but their general appearance is similar to that of the female of P. siccifolium. Stoll's figure 25 A may be a pupa of another species.

These figures differ so much from those which must be considered to represent the true siccifolium of Linnæus, that I have provisionally made the above remarks, in the hope of calling the attention of other entomologists to these facts, that when they are examining specimens with these figures, they may be led to look more closely, in the hope of finding other differences, and thus increase the number of species, which I believe to be more numerous than is generally supposed.

Phyllium Gorgon, G. R. Gray. *Female:* abdomen narrowed and lengthened, with the base of the third and fourth segments wider than the rest. Length 4 inches 2 lines, breadth 1 inch 3 lines. *Phasma siccifolium*, Perry, Arc. of Sci. i. pl. *Phyllium Gorgon*, G. R. Gray, Syn. of Phasm. 31. *Phyl. siccifolium*, Blanch. Hist. Nat. des Ins. iii. pl. 5, *female?*

Inhabits ——?

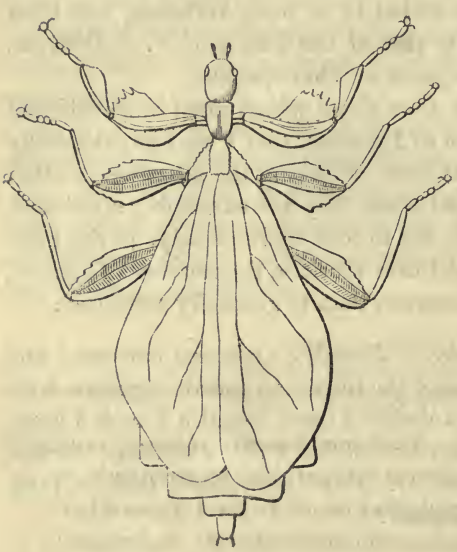
Phyllium chlorophyllium, G. R. Gray. *Male:* abdomen broad, and represented cymbiform. Femora of the fore legs dilated; the inner dilation moderate, with the inner margin entire, and the outer strongly dentate; the outer dilation narrow, rounded and entire. Length 3 inches. *Phasma chlorophyllia*, Stoll, Spectr. pl. 23, f. 89, *male*. *Phyllium Stollii*, Lep. et Serv. Enc. Meth. x. 115. *Phyl. chlorophyllium*, G. R. Gray, Syn. of Phasm. 31; Burm. Handb. Entom. ii. 2, 590.

Inhabits ——?

Phyllium Donovani, G. R. Gray. *Female:* abdomen narrow at its base, increasing to the middle of the third segment, and then gradually narrowing to the tip, with two ocellated spots on the fourth segment. Length 1 inch 5 lines, breadth $6\frac{3}{4}$ lines. Donovan's Ins. of Ind. pl. (upper figure). *Phyllium Donovani*, G. R. Gray, Syn. of Phasm. 31.

Inhabits ——?

Division c.—*The outer dilation dentated internally, and with more or less of a triangular form.*



Phyllium bilobatum.

Phyllium bilobatum. Female: abdomen narrow at the base, enlarging on each side to the middle of the third segment, and then gradually decreasing to the end of the fifth; the outer margins of the sixth and seventh are lobed, with the remaining segments suddenly lessened to the tip. Femora of the fore legs dilated; the inner dilation has the margin inwardly entire and outwardly much dentated, the outer dilation oval and entire, (see fig. *c*, p. 121). Length of body 2 inches 9 lines.

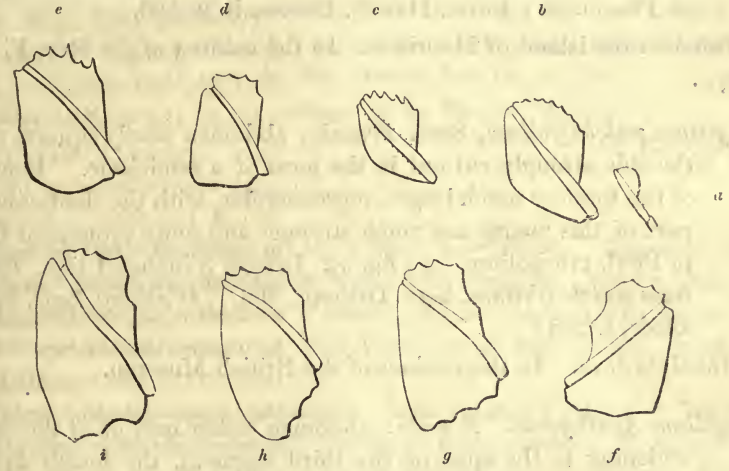
Inhabits the Philippine islands. In the cabinet of the British Museum.

Phyllium crurifolium, Serv. *Male and female:* abdomen ovular. Femora of the fore legs dilated, the outer dilation more extended than in P. siccifolium, and in the form of a triangle, with the internal side distinctly dentate, the inner dilation is denticulated towards the extremity. Length $2\frac{3}{4}$ inches, breadth 1 inch 4 lines. *Phyllium crurifolium*, Serv. Orthopt. 291.

Inhabits the East Indies. In the cabinet of the British Museum.

Phyllium Gelonus. *Male:* Abdomen rather narrow at its base, and then gradually widening to the third segment; the fourth is somewhat wider and rounded outwardly, and from hence to the tip gradually narrowed. Femora of the fore legs dilated, the inner dilation entire and curved inwardly, and slightly dentated outwardly, the outer dilation large, triangular, and nearly entire on both margins, (see fig. *d*). Length of body 2 inches 9 lines. *Phyllium crurifolium*, male? Serv. Orthopt. 291.

Inhabits the Sechelles Islands. In the cabinet of the British Museum.



Anterior femora of various species of Phyllium.
a. Geryon. *b*. siccifolium. *c*. bilobatum. *d*. Gelonus. *e*. celebicum. *f*. bioculatum. *g*. pulchrifolium. *h*. Agathyrsus. *i*. Scythe.

Phyllium celebicum, Dehaan. *Male and female:* Abdomen narrow at its base, and then gradually enlarging on each side to the middle of the third segment, and hence to the fifth hardly wider, but the sixth is rather wider, and suddenly rounded inwardly to the seventh, which is much narrower, and all the rest are gradually sloping to the end. In the female the femora of the fore legs are dilated, the inner dilation acutely dentated at its extremity; the outer dilation broad posteriorly and narrowing to a point at the apex, with the margins slightly serrated, (see fig. *e*). Length of body of the male, 2 inches 4 lines, breadth 10 lines; length of female 3 inches 10 lines, breadth 1 inch 9 lines. *Phyllium celebicum*, Dehaan, Verd. over de Nat. Gesch.

Inhabits the Philippine Islands. In the cabinets of the British Museum and the Rev. F. W. Hope.

Phyllium bioculatum, G. R. Gray. *Male and female:* abdomen very narrow at the base, widening to the fore part of the fourth segment, and then gradually decreasing to the commencement of the sixth, and suddenly narrowing to the tip. Femora of the fore legs dilated, the inner dilation moderate, with the inner margin curved and entire, and slightly dentated anteriorly; the outer dilation large, subtriangular, with the inner margin bluntly dentate, (see fig. *f*, femur of female). Length of male, 2 inches 4 lines; female 3 inches 3 lines. *Phyllium bioculatum*, G. R. Gray in Griff. An. Kingd. ii. 191, fol. 63, f. 3, male; Id. Syn. of Phasm. 30; Burm. Handb. Entom. ii. 2, 590.

Inhabits the island of Mauritius. In the cabinet of the Rev. F. W. Hope.

Phyllium pulchrifolium, Serv. *Female:* abdomen nearly square, with the side strongly cut out in the form of a semicircle. Femora of the forelegs much larger, more angular, with the denticulated part of this membrane much stronger and more prominent than in Phyl. crurifolium, (see fig. *g*). Length 3 inches 1 line. *Phyllium pulchrifolium*, Serv. Orthopt. 292. *Walking Leaf*, Edw. Birds, t. 258?

Inhabits Java. In the cabinet of the British Museum.

Phyllium Agathyrsus. Female: abdomen rather narrow at the base, widening to the apex of the third segment, the fourth to the seventh gradually narrowed, and the latter suddenly curved inwardly, with the rest of the segments much narrowed to the tip. Femora of the anterior legs greatly dilated; the inner dilation moderate, with the inner margin entire and curved and the outer acutely dentated; the outer dilation large, with the outer margin entire and advancing posteriorly much beyond the basal joint, the inner margin acutely serrated, (see fig. *h*).—Length of body 3 inches, breadth 1 inch 7 lines.

Inhabits Ceylon. In the cabinet of the British Museum.

Phyllium Scythe. Male: abdomen very narrow at the base, first segment quadrate, second gradually enlarging to the middle of the third, the fourth, fifth and sixth of nearly equal width, and the seventh suddenly rounded towards the eighth and remaining segments; two oculated spots on the fourth. Femora of the fore legs dilated, with the inner dilation narrow, lengthened and

strongly indented; the outer dilation in the form of a long triangle, with the outer margin entire and inner very slightly dentate. Length 2 inches 6 lines, breadth 11 lines.

Female: abdomen narrow at its base and gradually increasing to the middle of the third segment, the fourth rather wider, and then gradually decreasing to the seventh, which is suddenly rounded towards the eighth, and then sloping to the tip. Femora of the fore legs dilated; the inner dilation moderate, much indented, with its extremity irregularly dentated; the outer dilation large, with the outer margin rounded and entire, and the inner margin and apex widely serrated, (see fig. *i*). Length 3 inches 8 lines, breadth 1 inch 9 lines. *Phyllium pulchrifolium*, Dehaan, Verd. over de Nat. Gesch. Ins. pl. xv. f. 6.

Inhabits Sylhet. In the cabinet of the Rev. F. W. Hope.

G. R. Gray.

Note on the occurrence of the Locust near Derby. August 27th, 1842, in a cornfield close to my house was captured Locusta Christii (male), which I kept alive for a month, and it is now in my cabinet.—*Robert John Bell, Surgeon; Mickleover-house, near Derby, January* 19, 1843.

Note on Heliothrips Adonidum. Last autumn I observed this insect in great abundance in Mr. Loddiges' stove houses. It did much mischief to his plants during the preceding summer.—*Francis Walker, Southgate, February*, 1843.

*Note on Aphides, and on the Larva of a Fly which destroys them.** During the last summer and autumn the northern part of the county of Northumberland was infested with the Aphis in such immense quantities, that the farmers of that district sustained very considerable damage in consequence. The parent fly of this insect was black, with very long transparent wings, like the green blight so often seen upon rose-trees. The offspring of these flies were without wings, green, brown, red and yellowish, apparently adopting the colour of the leaf of the plant they were upon. These insects brought forth their young alive, and these young Aphides commenced their work of destruction the moment they were produced. The plant chiefly attacked by them was the turnip; though the Swedes did not suffer so much as the kinds sown later, probably from these two reasons:—1. The Swedes being

* Communicated by Mrs. Griffiths, of Torquay.

sown earlier, had grown too large to be so easily destroyed: 2ndly, On account of the property of the leaves to retain water longer than those of any other turnip. Thousands of these little insects might be observed sitting on the under side of every leaf, which they did not *eat*, but extracted the moisture from it in such a manner, that at the end of three or four days the turnip was completely killed, and could be crumbled between the finger and thumb, like scorched leaves. Between five and six hundred acres of turnips were totally destroyed in this way in the neighbourhood of Alnwick and Wooler, particularly about Millfield-plain and Flodden-field, though in the southern parts of the county, and on the Scotch side of the Tweed, there were none to be seen, or at least so few as not to be noticed. They were also sometimes found on the wheat and oats, and in one instance a quantity of wheat was entirely spoiled from having been bound up into sheaves with a great number of Aphides upon it. On the sheaves being opened again after two or three days, they appeared as if glued together, and had a very offensive smell, and the wheat was of course entirely useless. The Aphides were never found upon *ripe* oats, but were more numerous on the unripe than on any other kind of corn.

Various kinds of insects used to feed on these Aphides: — the red and black ants, Ichneumon flies, the larva of the large red lady-bird, and the caterpillar of a fly whose name I do not know. These caterpillars used to seize the Aphides and suck their juices from them: this was a very curious operation; when the insect had seized his prey, he raised his head in the air, and continued in that position until there was nothing left but the skin of the Aphis, which it got rid of by (as it were) wiping its mouth on the turnip-leaf. In this manner it would eat from fifteen to twenty at a time, and then remain inactive for half an hour, and then again feed, one caterpillar would thus destroy about a hundred in a day. The colour of the caterpillar was a transparent green, barred towards the tail with reddish brown and yellow, in length about half an inch. The chrysalis was reddish brown, always fixed on the underside of a turnip-leaf. The fly was about half an inch long, head large, and, together with the thorax, reddish brown; the wings as long as the body, rounded and transparent: the body darker brown approaching to black, barred with bright yellow like a wasp. The caterpillar was about ten days old before it became a chrysalis, and remained in that state other ten: the flies lived only three or four days, but were very quick and active, continually hovering over the turnips in great numbers, and appearing to settle on them very seldom, and then only for an instant. I kept a great number of

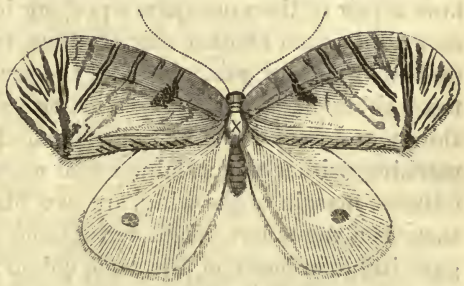
all these insects under glasses for some time, but could not discover the eggs of the fly, although there were several young caterpillars bred under my glasses. If the same circumstances should occur during the next turnip season, I should think many discoveries might be made, both with regard to these flies as well as to the Aphides, by any one who has time to examine them minutely, and I think every entomologist will find them well worthy of his attention.

I forgot to state that there was a similar visitation in the same district in Northumberland about seventy years ago; since which time, until last year they had not been observed.—*G. Clarke.*

[See Rusticus of Godalming on Aphides. "The young ones are born exactly like the old ones, but less; they stick their beaks through the rind and begin drawing sap when only a day old."—Ent. Mag. April, 1833. And again: —"Besides the lady-bird and its grub there are two other terrible enemies to the poor Aphis: one of which is a green ungainly looking grub without legs, which lays flat on the surface of the leaf, and stretches out its neck just like a leech, till it touches one of them: directly he feels one he seizes it in his teeth, and holds it up wriggling in the air till he has sucked all the goodness out of it, and left it a mere empty skin," &c.—Id. i. 223. It is pleasant to find observers thus corroborating each other's statements.—*Ed.*]

Note on the occurrence of Rare British Insects. Callidium violaceum in abundance near Elstree, Herts, on a building made of unbarked larch; first week in June. Locusta Christii? (*Curtis*), Child's Hill Lane, near Hempstead, August. Polyommatus Arion, Barnwell Hold, Northamptonshire; I took sixteen specimens the first week in July. Anthrocera Loti (*Stephens*), Barnwell Hold, last week in July, in plenty.—*Fredk. Bond; Kingsbury, February*, 1843.

Description of Psychopsis mimica. This pretty insect was taken at Adelaide, in South Australia, by Mr. Joseph Addison, and is now in the cabinet of the British Museum. The antennæ are wanting, and the head and prothorax are so crushed as to preclude their employment in drawing up generic characters. In the wings the nervures, and consequently the cells, are more numerous than in any insect of this order that has come under my notice. Three principal nervures, closely approximate and parallel, divide the basal portion of each wing (the lower as well as the upper) into two regions, whereof the superior or costal region is less than the inferior or abdominal region; at ra-



Psychopsis mimica.

ther less than two thirds the length of the wings these three nervures unite and cease, other nervures radiating from them to the margins of the wing: in the genera Nymphes, Osmylus and Chrysopa, a principal nervure or double nervure extends from the base of each wing just below the costal margin, which it appears gradually to approach, till near the apex, where it follows the arcuate form of the wing, and gradually vanishes before reaching the extreme apex. Myrmeleon, Stilbopteryx and Ascalaphus follow the same type of neuration, which is worthy of notice, as making the discrepancy of Psychopsis in this respect of much greater importance. Independently of this difference, the neuration approaches that of Osmylus, and I incline to assign it the filiform antennæ of that genus. The outline of the wings would not distinguish them from those of many of our commoner Geometræ; they are rounded at the tip and slightly produced at the anal angle; when at rest the wings are deflexed, and closely appressed to the sides of the body, as in Flata, to which genus, when in such a position, it bears a great although superficial resemblance, aided, in this individual, by the total loss of its antennæ. The eyes are black; the head, thoracical segments and legs are yellow, they appear very similar to those of Osmylus: the abdomen is somewhat clavate, hairy and lead-coloured. The wings are nearly transparent, all the nervures being pale delicate yellow: the fore wings are slightly tinged with yellow, intermixed with tints of pale delicate brown, and are beautifully adorned with numerous oblique transverse markings, of a deep, clear, distinct brown; all of these, except the last pair, originate in the costal margin and trend towards the anal angle of the wing; counting from the base of the wing, the first of these markings form an elongate shapeless blotch, extending about a third the width of the wing; next follows a pair of lines not quite equalling in length the blotch previously described; then another pair of lines, twice as long as the preceding pair; then a third pair, equalling the second in length and enclosing a third abbreviated line; then a fourth pair shorter than the second and third; and lastly, a fifth pair, parallel with the outer margin, and reaching neither the costal nor anal margin: at the anal angle, on the extreme margin of the wing, are two black spots, immediately within these is a vague but bright ferruginous spot, and above this an elongate irregular mark of the same colour; these ferruginous markings serve to connect the black spots with the third pair of lines previously described, forming altogether a fascia across the wing at its greatest width; the inferior or abdominal margin of the wing has eleven very delicate, short, oblique, brown lines, which point towards the tip:

the hind wings are hyaline, with delicately yellow nervures, and each has a conspicuous dark brown spot rather beyond the middle: they are furnished with pale yellow cilia. The size is rather less than represented in the figure.—*Edward Newman; Hanover St., Peckham, November*, 1842.

Note on the capture of Insects by Flowers. Perhaps the facts I am about to mention may not be of uncommon occurrence, although I do not remember to have seen them noticed in any work on Natural History. We are all acquainted with the curious properties of the leaves of Drosera rotundifolia, in the treacherous embraces of which many a poor fly meets with an untimely end. But there appear to be certain flowers which allure (although in a different manner) some of the larger insects to a similar doom. I allude particularly to the delicate white flowers of Œnothera speciosa, in which moths may occasionally be found entrapped, apparently fastened by the tongue to the centre of the blossom, from which they were extracting its glutinous sweets. Such was the case with an individual of Plusia Gamma found in one of these flowers in my garden, and which had evidently died from its inability to extricate itself from this honied trap: nay, so firmly was it fixed, that my wife was unable to detach it whole from the flower, without tearing the petals asunder.

Shortly after this occurrence a friend of ours discovered a Sphinx Ligustri in a similar situation; and another far more fortunately obtained in the same manner, and from a flower of (I believe) the same species of Œnothera, a fine specimen of the rare and beautiful Deilephila Galii. Neither of these ladies was a collector, but the latter was so struck with the beauty of her prize that she carefully preserved the insect, and felt interested in ascertaining its name, which she had correctly done from some work on Entomology. I do not pretend to a scientific knowledge of either this branch of Natural History or of Botany, though once a collector, and still an admirer, of both plants and insects; but it would interest me to be informed whether or not this property in the Œnothera has been before observed, and whether there are any other of our garden flowers which prove equally treacherous to their unsuspecting insect visitors.—*A.; Sudbury, Feb.* 1843.*

Anecdote of an Idiot Boy catching and devouring honey bees.—

"We had in this village [Selborne] more than twenty years ago, an idiot boy,—whom I well remember,—who, from a child, showed a strong propensity to bees; they were his food, his amusement, his sole object. And as people of this cast have seldom more than one point in view, so this lad exerted all his few faculties on this one pur-

* Communicated by H. Doubleday, Esq.

suit. In the winter he dozed away his time, within his father's house, by the fire-side, in a kind of torpid state, seldom departing from the chimney-corner; but in the summer he was all alert, and in quest of his game in the fields and on sunny banks. Honey-bees, humble-bees, and wasps, were his prey wherever he found them: he had no apprehensions from their stings, but would seize them *nudis manibus*, and at once disarm them of their weapons, and suck their bodies for the sake of their honey-bags.—Sometimes he would fill his bosom between his shirt and his skin with a number of these captives: and sometimes would confine them in bottles. He was a very Merops apiaster or bee-bird; and very injurious to men who kept bees; for he would slide into their bee-gardens, and, sitting down before the stools, would rap with his finger on the hives, and so take the bees as they came out. He has been known to overturn hives for the sake of the honey, of which he was passionately fond. When metheglin was making, he would linger round the tubs and vessels, begging a draught of what he called bee-wine. As he ran about, he used to make a humming noise with his lips, resembling the buzzing of bees. This lad was lean and sallow, and of a cadaverous complexion; and, except in his favourite pursuit, in which he was wonderfully adroit, discovered no manner of understanding. Had his capacity been better, and directed to the same object, he had perhaps abated much of our wonder at the feats of a more modern exhibitor of bees; and we may justly say of him now,

'Thou,
Had thy presiding star propitious shone,
Shouldst Wildman be.'

"When a tall youth, he was removed from hence to a distant village, where he died, as I understand, before he arrived at manhood."—*White's Natural History of Selborne: with Notes by the Rev. L. Jenyns. Van Voorst*, 1843. p. 264.

Note on a Shower of Aphides.

"As we have remarked above, that insects are often conveyed from one country to another in a very unaccountable manner, I shall here mention an emigration of small Aphides, which was observed in the village of Selborne no longer ago than August the 1st, 1785.

"At about three o'clock in the afternoon of that day, which was very hot, the people of this village were surprised by a shower of Aphides, or smother-flies, which fell in these parts. Those that were walking in the street at that juncture, found themselves covered with these insects, which settled also on the hedges and gardens, blackening all the vegetables where they alighted. My annuals were discoloured with them, and the stalks of a bed of onions were quite coated over for six days after. These armies were then, no doubt, in a state of emigration, and shifting their quarters; and might have come, as far as we know, from the great hop plantations of Kent or Sussex, the wind being all that day in the easterly quarter. They were observed at the same time in great clouds about Farnham, and all along the lane from Farnham to Alton."—*Id.* p. 341.

Note on Fleas infesting the holes of the Sand-martin.

White observes that the old holes of the sand-martin are forsaken, and thinks it may arise from their so abounding with fleas as to become untenantable. He has seen these fleas swarming at the mouth of the holes, like bees on the stools of their hives.—*Id.* p. 236.

Note on the Pterodactyle Tribe considered as Marsupial Bats.

By Edward Newman, F.L.S. & Z.S.

"Ce sont incontestablement de tous les êtres dont ce livre nous révéle l'ancienne existence, les plus extraordinaires, et ceux qui, si on les voyait vivans, paroîtroient les plus étrangers à toute la nature actuelle."—*Cuvier, Ossemens Fossiles*, pt. 2, v. 379.

The upper figure represents Pterodactylus crassirostris, the lower, Pter. brevirostris.

There existed at a certain but unknown era of the world, animals so different from any with which we are acquainted in a living state, that we seem almost lost in our attempts to understand their structure,

so awkward and uncouth does it appear. One conclusion is general amongst those who have described these creatures; namely, that they were possessed of powerful wings, capable of sustaining continuous and rapid flight: but beyond this I cannot consider any of the hypotheses relating to pterodactyles as firmly established; and as I have ventured, in my sketch of the 'System of Nature,' to express an opinion that they were marsupial bats, I think myself in some degree called on to defend that opinion, or at least to state my reasons for advancing it. I trust that in the course of the enquiry I shall be able, if not to establish my own views, at least to point out some peculiarities in structure well worthy the attention of the readers of 'The Zoologist.'

That the pterodactyles were vertebrated animals must be admitted by all; but whether fishes, reptiles, birds, marsupials or placentals, is a matter concerning which a diversity of opinions have been entertained. It was suggested by one author that they were birds; but the idea does not seem to have gained many proselytes. The earlier writers generally considered the pterodactyles as mammalious animals clothed with hair; and this opinion, like the former, has long been regarded as an exploded error. In venturing therefore to revive it, I am not altogether unprepared for the ridicule which my supposed ignorance must of necessity provoke. I quite anticipate that my views will be received with that condescending, unassuming and gentlemanly, but very decisive smile which says, more forcibly than words, "You are in the wrong: you should turn to the masterly observations of Buckland; in his 'Bridgwater Treatise' you will find the question set at rest for ever; and you will at once perceive that your present views originate in the want of sufficient information." I have often spoken of these same pterodactyles with men of good repute as comparative anatomists, but I never could get them beyond the words,—"Cuvier has said it; Buckland has declared it:"—and thus a question of the highest interest depends not on fact, but on the infallibility of Cuvier and Buckland. Now I believe it within the range of *possibility* that Cuvier and Buckland should both be in error. I confess that this is highly *improbable*, but I contend that it is *possible*. Regard them as we may, there is still that evidence of humanity about them that induces us to suppose them capable of error. The time is hardly past when the world of naturalists was prostrate before Linneus: and when honest Peter Collinson, happening to see some swallows winging their way to warmer climes on the approach of winter, and having ventured to doubt the celebrated Linnean hypothesis of submersion, the world turned on poor gentle Peter, and gave him to understand he

was a fool: —"Dr. Linnæus has said it, and will you dispute his veracity?"* Peter submitted, and for years swallows continued to dash desperately into the ponds when they beheld the first symptoms of winter, and there clinging to the submerged stems of rushes, they stuck their beaks into the mud, pointed their forked tails to the heavens, and calmly and philosophically defied the wintry winds that were raging above, and the hungry eels that were wriggling below. We now begin to think that Linneus was wrong; and that swallows do fly southward as Peter Collinson imagined. Why then should we deny the liability to err? Why should we say—"It is useless to enquire; it is idle to adduce facts; the question is set at rest for ever: the creature is a reptile, a genus or subgenus of a well-known family of lizards: Cuvier has said it, and will you dispute his veracity?"

There are two points on which I dissent from this dictum: — 1. I consider the pterodactyles to have constituted a large and most remarkable group of animals, equal in extent to the orders of Linneus, and much more diversified in economy than many of these, since it contained carnivorous, piscivorous and insectivorous animals. 2. I consider they were mammalious and clothed with hair. There is still another point in connexion with pterodactyles, at which I merely hint as a matter of surmise. It is this; that the race may yet probably exist; that representatives of the fossil pterodactyles may yet be found amongst the bats which abound within the tropics. Had we found the opossum of Stonesfield in a perfect state, with the curious history of its marsupial structure made manifest, anterior to the discovery of America and Australia, we should have thought it a being of another system, so different is an opossum from the animals of the Old World; but those rich regions have supplied the connecting links, and it is more than possible they will do the same for the pterodactyles. Species and even genera become extinct, but it rarely happens that a vast group like the pterodactyles is wholly lost, and left without a representative.

(To be continued).

Note on the Pterodactyles.—

"It is probable also that the pterodactyles had the power of swimming, which is so common in reptiles, and which is now possessed by the Pteropus Pselaphon, or vampire bat of the island of Bonin. Thus like Milton's fiend, all-qualified for all services and all elements, the creature was a fit companion for the kindred reptiles which swarmed in the seas or crawled on the shores of a turbulent planet.

* Linnean Correspondence, i. 54.

'The fiend,
O'er bog, or steep, through strait, rough, dense, or rare,
With head, hands, wings, or feet, pursues his way,
And swims, or sinks, or wades, or creeps, or flies.'—*Par. Lost*, ii. 947.

With flocks of such-like creatures flying in the air, and shoals of no less monstrous Ichthyosauri and Plesiosauri swarming in the ocean, and gigantic crocodiles and tortoises crawling on the shores of the primæval lakes and rivers, air, sea and land must have been strangely tenanted in these early periods of our infant world."—*Buckland's Bridgwater Treatise*, i. 224. *Geological Transactions*, *N. S.* iii. part 1.

Note on Wolves in Canada. You will think this is rather an unpleasant time for running about, the thermometer 20° below zero; but it is the only time we Quebeckers have, and being out, I am determined to see as much as possible. Last week we went back twenty miles beyond civilization, into some pine groves where lumber was getting out — at Rivière du Loup; and what is an uncommon occurrence here, a pack of wolves had been ranging the neighbourhood for some time: we saw their tracks on the snow in every direction: — a very large one had been taken alive the week before, and was safely caged: he was caught in a fox-trap chained to a tree, but the chain snapped and he got away. He was however tracked by a stout man on snow-shoes, who followed the wolf a whole day, and at last came up with him within a hundred yards of the spot where the trap was set, both man and wolf regularly fagged out. Some men would have killed the wolf on the spot, as government pays a reward of ten dollars for every wolf's scalp brought in; but K—— being at the shanty they sent for him to be in at the death; and he, seeing the animal so fagged, had his mouth and legs secured and the trap taken off, all which the wolf suffered without making the slightest resistance or struggle.—*L.**

Note on the Wolf in Canada.

"Their mode of biting is very different from that of a dog; instead of retaining his hold as a dog does, when he seizes his enemy, the wolf bites by repeated snaps, given, however, with great force. As illustrative of this habit, I may mention a farmer in New Hampshire, not very far from this place, who was one night awakened by a noise in his hog-pen; on looking out he saw what he supposed to be a fox on the low sloping roof of the sty. He immediately came out in his shirt, but found that the animal was a grey wolf, which, instead of making off, fiercely attacked him, rushing down the roof towards him, and before the man had time to move back, the wolf had bitten his arm three times, with these quick and repeated snaps, lacerating it from the elbow to the wrist: then, however, he leaped from the roof to the ground, and by so doing lost

* Communicated, together with the following notes on moose and bears, bearing the same signature, by Jacob Hoyer, Esq.: being portions of a private letter, Mr. Hoyer prefers our not publishing the writer's name.

his advantage: for the man succeeded in seizing him on each side of the neck, with his hands, and held him firmly in that position, till his wife, whom he called out, came up with a large butcher's knife, and cut the beast's throat. It was three months before the man's arm was healed: every incision, it was said, piercing to the bone. * * * Sometimes, when considerable havoc has been made among the sheep, a general assembly of the neighbourhood is called, who proceed to the swamp where the wolves are supposed to harbour by day, armed with guns, pitchforks or clubs; they then separate, to surround the swamp, and travel towards the centre, lessening the circle as they proceed. Whatever animals are in the swamp are of course roused, and are generally killed. One of these hunts I attended last fall, but we had not a sufficient number of men to be close to each other: we put up a black wolf, but he broke through the ring, and escaped, though shot at. But the more ordinary methods of taking them are by traps or poison, which are chiefly set in winter. When caught in a trap, the wolf is generally so cowed as to allow a man to go up to him and handle him like a dog; though it is a dangerous experiment. A very large grey wolf was poisoned a few weeks ago by J. Hughes: I went to his house to see it, but was disappointed, as he had sent it to Sherbrooke. He told me that it measured six feet in length, including the tail, and that it stood about three feet high: though very poor, it was as large round as a good-sized sheep: and probably would weigh about seventy pounds. The mode of setting poison is this: the kernels or seeds of *nux vomica* are grated or pounded, then mixed up with three or four times their bulk of fat or grease, and honey—wolves are very fond of the latter—and made into balls about as large as a hen's egg. These are placed in the woods, covered with a piece of flesh or tripe, and some offal is hung on a tree near the spot to attract the wolves by its scent. Hughes says, that a large space round the tree was beaten hard, by the wolf's walking round and leaping up, in endeavouring to reach the offal.—*Gosse's 'Canadian Naturalist,'* 33.

Note on Bears in Canada. If fruit is abundant, bears only visit the settlements when the corn is ripe, and then they sometimes play tremendous havoc with the oat-crop: sometimes however a single one will come in and worry the sheep, and W—— assured me, that this fall, near his mills, the farmers suffered much by one fellow in particular: three men sat up in a barn one night on purpose to shoot him, and although the beast came and prowled about for an hour or two, they could not summon courage to fire, he was so terrible grand:—these chaps were Canadians; an Irishman or an Indian would have acted differently. Next night some stouter hearts were prepared to give him a reception, but Master Bruin did not condescend to come, and escaped scot free.—*L.*

Note on Bears in Canada.—

"His chief food seems to be of a vegetable nature, grain, fruits and roots. He has an appetite for pork, however, and occasionally makes a visit to the farmer's hog-sty for the purpose of cultivating an acquaintance with the grunting inhabitants. Some years ago, one of my nearest neighbours was aroused in the night by a commotion in his hog-pen. Suspecting the cause he jumped up immediately, took his gun, and saw a bear in the act of getting over the fence with a fine hog, embraced very lovingly in

his fore paws. The man fired (while his wife held a light) and killed the intruder. It is difficult to hurt a bear with any weapon but fire-arms: he fights with his fore paws like a cat; and so watchful is he, and so expert at warding off every blow that is made at him, that it is next to impossible to strike his head, the only part in which he is vulnerable; for you might about as well batter a feather-bed as the body of a bear, so encased and shielded by an enormous layer of fat. In our climate, he becomes torpid during winter, generally choosing for his hybernaculum some large hollow log, or a cavity beneath the root of an overthrown tree. The species is numerous in all the wooded parts of this continent, even to the shores of the Gulf of Mexico. In the southern states, he commits depredations on the farmer's fields of maize, when the corn is in that milky state called 'roasting ears,' so prized for boiling and eating as a table dish, like green peas, or roasting whole on the cob. The bear manifests a singular unity of taste with the farmer, and devours and treads down a large quantity, as he finds no difficulty in climbing over the zigzag rail fence. I have been told that he repeats his nightly visits to the same field; and, what is singular, always, on such occasions, mounts the fence, night after night, at the same spot where he got over the first time. The planters take advantage of this regular habit, by fastening to the fence a heavily loaded gun, at such an angle that it shall point at the bear's breast, as he rises on his hind legs. The identical crossing place is easily known by his great tracks in the soft earth. A stick is attached to the trigger, and this is made fast, at right angles, to a transverse stick, resting on two forks about breast high, a few inches outside the fence. The bear rears up to put his fore paws on the rails, and in getting over, presses with his breast against the transverse stick, which drives back the trigger, and poor Bruin instantly receives the reward of his dishonesty."—*Gosse's 'Canadian Naturalist,'* p. 286.

Note on the Moose in Canada. You are probably aware that owing to the depth of snow in our woods, the moose deer cannot move about much, and therefore congregate in small herds, and tread down the snow: they feed on the branches of the trees, and extend the circle of their movements, as food becomes scarce: the snow accumulates all round, except in the part constantly trodden, so that at length they are confined in a sort of paddock, commonly called "a yard of moose deer." To the edges of this yard parties go to shoot — a sport almost as romantic as firing in a pig-sty. The Indians search out these spots and mark their situation, well knowing the moose cannot move out before the sunny days of March have caused a partial thaw, and the surface is again hardened by frosty nights. The Indians, having marked one of these paddocks, come to "les Anglais," and drive a bargain something in this way: — that it will take so many days to reach the moose-yard; that they are to be found in provisions and have 5s. a day, and also £2. 10s. for every moose the *gentlemen* kill, and the meat and skin of the animal. If no gentlemen accept the terms, they go alone, for the sake of the skin and the venison. In making a bargain with these fellows, it is cheapest not to pay by the

day, but to give them so much for the job, for they will take you round and round in large circles to make out the time, and perhaps be within rifle-shot of the moose all the time. In the spring the chase is more exciting: the moose takes the crust, but is so heavy as to sink at every foot-step, while the hunters follow on snow shoes. Here the sagacity of the Indian is put to the test; and unless well accustomed to the exercise, Mister, who hires him, knocks up, and is unable to follow. If the moose gets away or is killed by the Indian, the pay stops; it is his business not to keep the man up with the moose, but to keep the moose constantly in sight, which he effects by running round and turning the animal. When the gentleman is nearly tired out, the Indian fires at an imaginary fox; the shot misses the fox and accidentally breaks the leg of the moose: the gentleman comes up and takes a few shots at the animal, now as helpless as a tied-up cow.—*L.*

Note on the Moose in Canada.—

"Moose are frequently taken in the Indian-stream territory, a kind of neutral ground on the boundary of this province and New Hampshire, claimed by both governments. Paths are worn by the feet of these animals, leading to the brook, whither they resort to drink: and they are caught by traps laid in these paths. I am told they are almost all dead when found, as they soon kick and worry themselves to death. I saw a stuffed moose at Quebec, but it was not well mounted; if I recollect rightly, it was taller than a horse.

"There is an opinion prevalent among the Indians, that the moose, among the methods of self-preservation with which he seems more acquainted than almost any other animal, has the power of remaining under water for a long time. Two credible Indians, after a long day's absence on a hunt, came in and stated that they had chased a moose into a small pond; that they had seen him go to the middle of it and disappear, and then, choosing positions from which they could see every part of the circumference of the pond, smoked and waited until evening; during all which time they could see no motion of the water, or other indication of the position of the moose.

"At length, being discouraged, they had abandoned all hope of taking him, and returned home. Not long afterwards came a solitary hunter, loaded with meat, who related, that having followed the track of a moose for some distance, he had traced it to the pond before mentioned; but having also discovered the tracks of two men, made at the same time as those of the moose, he concluded they must have killed it. Nevertheless, approaching cautiously to the margin of the pond, he sat down to rest. Presently, he saw the moose rise slowly in the centre of the pond, which was not very deep, and wade towards the shore where he was sitting. When he came sufficiently near, he shot him in the water. The moose is more shy and difficult to take than any other animal. He is more vigilant, and his senses more acute, than those of the buffalo or caribou. He is fleeter than the elk, and more prudent and crafty than the deer. In the most violent storm, when the wind, and the thunder, and the falling timber are making the loudest and most incessant roar, if a man, either with his foot or his hand, breaks the smallest dry limb in the forest, the moose will hear it: and although he

does not always run, he ceases eating, and rouses his attention to all sounds. If, in the course of an hour, or thereabouts, the man neither moves nor makes the least noise, the animal may begin to feed again, but does not forget what he heard, and is for many hours more vigilant than before."—*Gosse's 'Canadian Naturalist,'* p. 57.

Enquiry respecting a Wagtail. When spending a few days lately at a friend's house in Worcestershire, my attention was attracted by the appearance of a yellow wagtail, which was a daily visitor on the balcony of the drawing-room window. Never having before observed a bird of this kind so familiar in its approach to a habitation, I was told it had excited the attention of all the family, it having been in the habit of frequenting the balcony during the greater part of the preceding summer, unattended by any mate; and what particularly excited curiosity was its darting against the window-panes, as if to peck at some object, yet what this object might be, none had been able to discover. It was not long ere I had an opportunity of witnessing this action of the wagtail, for I was soon startled, whilst reading, by the sharp peck against the window, and looking up, saw the elegant little bird running along the rail of the balcony. I hastened to the window and looked intently along the frame, but nothing could I see, being winter, it is rare to see any insect in such a situation. The bird, on my approach, flew off the rail, and I saw him alight on the gravel walk below; but scarcely had I resumed my book when he was at his former station, amusing himself on the rail, and occasionally darting suddenly against the window as before; all attempts to discover the cause of this were unsuccessful. This wagtail, like the rest of his congeners, was extremely pretty and graceful in his motions, and peculiarly elegant in form, far surpassing, in this respect, his relative the pied wagtail, several of which latter species were to be seen, apparently his associates, on the gravel walk, but closer observation showed they were not to be considered his companions, since he evidently held himself aloof from their society. The lady of the house informed me that the yellow wagtail had first been noticed about the beginning of last April, when it remained about six weeks; it then disappeared for a couple of months or more, and was again observed at its old station early in September. I feel desirous of knowing to what species this wagtail belongs: the doubt seems to lie between the common yellow, called by Yarrell "Ray's wagtail," and the grey-headed wagtail, described as a foreign bird, and only occasionally found in this country. I send the above details in the hope that some one of your correspon-

dents may be able to aid in the solution of the question, as well as to suggest the cause of the frequent dartings against the window. — *A. Holland; Stratford-on-Avon, March* 8, 1843.

[The bird meant is evidently the grey wagtail (*Motacilla boarula*). A person here was greatly annoyed by one of the same species flying against the window in the manner described by your correspondent, from the dirt it left on the glass. I have no doubt it fancied it saw insects.—*H. Doubleday*].

Notes on the Birds of Sussex. By A. E. Knox, Esq., M.A.

The geographical position of Sussex, as a southern maritime county, is particularly favourable for observations on the distribution and migration of many of our birds of passage: and I have availed myself of the opportunity afforded by a residence of some years, and frequent visits at all seasons to different parts of the coast, to pay much attention to this interesting subject.

The Pied Wagtail.—During the course of my observations I was struck by the incorrectness of the received opinion that our pied wagtail is migratory only in the northern, but stationary in the southern counties of England. This discovery led to another consideration. Mr. Gould, in his work on the birds of Europe, has separated the pied wagtail which occurs on the continent from the British species, distinguishing the latter as Motacilla Yarrellii, and the former as the true Motacilla alba of Linnæus; and he supposes the channel to be the line of demarcation between the habitats of the two species.

Mr. Yarrell, in his admirable work on British birds, while coinciding for the present in Mr. Gould's views, has declined to give a decided, or rather a final opinion of his own, but has quoted Mr. Gould's observations, and added illustrations of the two species; and with that impartiality which is an invariable accompaniment of true genius, has invited the notice of future observers to the subject.

Whatever, therefore, may be my views as to the accuracy of this specific distinction, I am anxious to abstain from expressing an opinion at variance with such high authority, preferring that others should draw their own conclusions from my observations, which I trust may be found to throw some light on the subject, or at least to elucidate a portion of the history of one of our most beautiful birds.

The pied wagtail arrives from the continent on the shores of Sussex about the middle of March. Although several remain with us during the winter, these bear but a small proportion to the numbers that visit us in the spring. On fine days during this month, with a gentle

breeze from the south, I have frequently seen them, on different parts of the coast, flying directly from the south, and from such a distance at sea as at first to be scarcely perceptible, gradually however becoming more distinct, until they alighted near me on the open shore, sometimes singly, and at other times in small parties. The fields in the neighbourhood of the coast, where but a short time before scarcely an individual was to be found, are soon tenanted by numbers of this species, and for several days they continue dropping on the shores in detached parties. The old male birds arrive first, presenting the beautiful jet black and pure white plumage of the breeding season; while the females, and the males of the preceding year, which resemble the females, the plumage on the back being of an iron grey, do not make their appearance until a few days afterwards. It may be observed that the white on the forehead and cheeks of these newly arrived birds is much more pure at this time than in those which winter in England, and altogether they have a fresher, and, as it were, a cleaner appearance than they themselves present a short time after their arrival in this country.

Some of the old males appear to have paired before their departure from the continent; for after alighting on the shore they exhibit many signs of restlessness and anxiety, performing short flights, and incessantly calling for their mates.

It is worthy of remark, that those pied wagtails which remain with us during the winter, do not assume the summer garb at so early a period as their travelled brethren; indeed on the arrival of the latter, who invariably make their appearance in the full breeding plumage, the former have but partially commenced the change, — a few black patches beginning to appear on the throat, and the light grey of the back being varied with occasional feathers of a darker hue. In about a fortnight afterwards this assumption of the breeding plumage is complete, and at the expiration of that time the pied wagtails which have arrived from the continent, and those which have remained in England during the winter, present the same appearance.

After remaining in the neighbourhood of the coast for a few days, these birds proceed inland in a northern direction; and any practical observer of birds in the interior of the country may perceive how much more numerous they suddenly become at this period. There is scarcely a pool, roadside ditch, or village horse-pond, where they may not be seen in pairs; and in districts where but a week before the species was but thinly distributed.

These birds pair early and moult soon, having completed the change at the end of July or early in August. The black feathers gradually

disappear from the throat in both sexes, and the dorsal plumage becomes of a lighter colour in each; the back of the male assuming the grey of the female during the breeding season, while that of the female and the young of the year in both sexes changes to a very light grey. Indeed, between the two latter, there is no external difference of appearance.

About the middle of August the pied wagtails commence their return towards the sea-coast, and now first appear to be gregarious in their habits. At this season I have noticed them in considerable numbers on village commons, and similar localities in the interior of the county, where they remain but a few days, and then proceed to the south. At the latter end of the month, or the beginning of September, they may be seen near the sea, in flocks of from thirty to forty, flying invariably from west to east, parallel with the shore, and following each other in constant succession. These flights continue from daylight until about ten o'clock in the forenoon; and it is a remarkable fact, that so steadily do they pursue this course, and so pertinacious are they in adhering to it, that even a shot, fired at an advancing party, and the death of more than one individual, cannot induce the remainder to fly in a different direction; for after opening to the right and left, their ranks again close, and the progress towards the east is resumed as before.

I have observed that their proximity to the shore, during this transit from west to east, seems to depend in some degree upon the character and extent of the country intervening between the downs and the sea. For instance, in the more western parts of the county, between Chichester and Worthing, where a flat, maritime district, of considerable extent, and in a high state of cultivation, lies between the hills and the sea, the flocks appear to be less numerous, or rather more scattered, and occur at greater distances from the coast than in the neighbourhood of Brighton, where the downs approach closely to the shore, and where the flocks appear to become more concentrated.

I am acquainted with a good practical observer, who informs me that in the neighbourhood of Brighton, he has seen upwards of a thousand pass in a single morning. The same person has witnessed, as well as myself, the arrival of these birds from the continent in March, on the open coast near Hove, between Brighton and Shoreham.

I think there can be but little doubt that these flocks, the greatest proportion of which consists of the young birds of the year, at this time but a few months old, in thus pursuing their course along the shore in an easterly direction, are impelled by a wonderful instinct to

seek the shores of the neighbouring county of Kent, where the distance from land to land being considerably less, the voyage may be performed with comparative ease and security. The peculiar flight of the Motacillidæ may perhaps be also taken into consideration. There appears to be a continual tendency, as it were, to sink towards the ground, which is counteracted by a sudden jerk of the wings, performed at regular intervals, and producing a swinging motion in the air, which, when compared with the flight of other birds, has at least the *appearance* of being difficult and laboured.

It is certain that these birds never retrace their course in a *westerly* direction; and that, from this period, throughout the entire county, the species continues to be comparatively but sparingly distributed, until augmented by fresh arrivals from the continent, in the warm days of the ensuing spring. A. E. Knox.

New Grove, Petworth, March, 1843.

(To be continued).

Note on the Grey Wagtail. The grey wagtail (*Motacilla boarula*) resides with us all the year: in the winter season it is to be found along every brook, and even on the banks of the rivers Sheaf and Don in the middle of our populous town; then, of course, in its plainer plumage. In the beginning of April it acquires its black throat, and then retires to the margins of the mountain streams on the adjacent moors, to breed. — *John Heppenstall; Upperthorpe, near Sheffield, March*, 1843.

*Notes on the occurrence of some of the rarer British Birds in the County of Cornwall.** By Edward Hearle Rodd, Esq.

Among the many interesting examples in British Ornithology which the county of Cornwall has from time to time displayed, and more particularly since the attention of naturalists has been directed to the favorable opportunities which the county presents, from its maritime, peninsular, and extreme westerly position in the kingdom, for ascertaining the existence of occasional stragglers, which, according to modern naturalists, are entitled to a place in the British Fauna, provided they are so found in a natural and wild state, I have the pleasure of reporting that I have ascertained that the following rare British birds may now be included in our Cornish catalogue.

* Read before the Royal Institute of Cornwall.

Pectoral Sandpiper. — The first is the pectoral sandpiper, or more properly speaking, perhaps, Tringa (*Tringa pectoralis*), which is an American species. A figure of this bird is given in Eyton's Rarer British Birds. The present, I believe, is the only instance of its capture in Cornwall, and the second authenticated instance of its occurrence in Britain. The specimen here alluded to was killed on the beach of Annet, one of the Isles of Scilly, and is now in the valuable collection of David Michell, Esq., of this town. A correct coloured drawing of the individual was submitted to Mr. Yarrell, and he coincided with the opinion which we had formed of its being Tringa pectoralis. I examined minutely the specimen after it was preserved, and on comparing it with specimens of the common dunlin (*Tringa variabilis*) in summer plumage, I observed that the general aspect of the bird, as well as the colours on the back and upper parts, were very similar to those of that species. The *total absence* of the black on the belly, which, at this season, is more or less developed in the dunlin, shows a striking difference; and on further examination, I found some minor variations in form and dimensions, which indicated unequivocal marks of distinction.

TRINGA PECTORALIS.

Length of the middle toe,	$1\frac{1}{16}$ inch.
Breadth of expanded wings,	$15\frac{1}{2}$
Naked part of tibia,	$\frac{1}{2}$
Length of wing from carpal joint,	$5\frac{1}{8}$
Tail,	$2\frac{1}{4}$

Basal part of the bill yellowish green. Tarsi the same.

TRINGA VARIABILIS.

Length of middle toe,	$\frac{7}{8}\ \frac{1}{4}$
Length of wing from carpal joint,	$4\frac{3}{8}$

The shape of Tringa pectoralis is longer and narrower, and appears more compressed and *rail*-shaped than that of Tringa variabilis. In its mode of flight and character on the ground, it bore great resemblance to the common sandpiper; and taking into consideration its greater length of tail, the length of the tibiæ and shape of the bill, which is more slender and compressed at the base than in the dunlin, it appears to me that there are affinities observable in this species to both the Tringæ and Totani, which are calculated to show, in a gradual and beautiful point of view, the intermediate link in the chain of Nature which unites the two families.

The Wood-chat. A specimen of the wood-chat shrike (*Lanius rufus*), was taken in a fishing-boat at Scilly. The claims of this species to rank as a British bird, at the time Mr. Selby published the first edition of his 'Illustrations of British Ornithology,' were so much doubted by him, that he refrained from giving either a figure or description of the bird, although it had been considered as British by most of our naturalists; but since the first publication of his valuable work, whatever doubts existed then, some instances have occurred of its capture in England; and I am proud in being able to report that Cornwall can afford one of the instances of the occurrence of so rare a British bird. The specimen, which I now have in my collection, is an adult male bird, equal in size to the red-backed shrike, or common butcher-bird (*Lanius Collurio*), which in shape and form it greatly resembles. The figures given by Bewick and Yarrell afford a correct representation of the bird.

White-winged Crossbill. The next rare bird which has come under my notice, and of which a correct figure is given in the second volume of Yarrell's 'British Birds,' is the white-winged crossbill, (*Loxia leucoptera*). This bird was killed a few years since at Lariggan, near this place, and was preserved in a very mutilated state as a supposed chaffinch. The two white bars in the wing no doubt caused the mistake, and it was by mere accident that I detected the specimen just in time to prevent its falling to pieces, through the united agencies of moths and mildew. This species is not, I observe, included by Selby as a British bird; and, according to Yarrell, not more than four authenticated instances of its capture in England are recorded.

With reference to these three instances of very rare British birds being found in our county, I may remark that two out of the three, namely, the white-winged crossbill and the pectoral sandpiper, are North-American species, whilst the wood-chat shrike is found in France, Germany, &c. It is therefore an interesting fact connected with the natural history of the county, and one that cannot but act as an encouragement to our resident scientific naturalists to watch with interest what the seasons may produce, that in the space between the Scilly isles and the Lizard, comprising two of the cardinal points of the kingdom, the most southerly and westerly points, these three rare birds have occurred; thus showing at least the probability of many of our birds of passage taking advantage of the nearest cardinal point in this country to alight on, if not permanently to reside in, till their migratory calls again induce them to return.

The Wood Sandpiper (Totanus glareola), another species considered by ornithological writers as a very rare visitant to this country, has appeared in some numbers in the Land's End district. No fewer than nine or ten were shot during the month of August this year: these individuals appeared to be birds of the year. The dusky sandpiper (*Totanus fuscus*) I have also at length discovered in our neighbourhood, in a very interesting specimen killed by Mr. Pendarves at the Land's End, in the first week of September, in a state of change from summer to winter plumage, as appeared by a few grey feathers appearing on the back. The bird figured by Bewick as the spotted redshank is this bird, and is represented in change of plumage. I have not until now discovered this species in Cornwall. It is not uncommon in the winter season in the fens of Cambridgeshire and Lincolnshire. This bird completes the group of sandpipers (*Totani*), all killed in the neighbourhood of Penzance: the existence of the spotted sandpiper (*Totanus macularia*) of America being doubted as belonging to Britain.

I have also obtained, within the last two months, a very perfect adult female specimen of Montagu's or the ash-coloured harrier (*Falco cineraceus*), killed near Trereife by Mr. Day le Grice; and another adult male specimen, killed some years since at Trelaske, has also passed into my hands, which, with the hen harrier and marsh harrier, completes the family of Circas of the Falconidæ amongst the Cornish birds. I may here perhaps be permitted to suggest, that the example in the museum of the Institution at Truro, labelled as the ash-coloured falcon, is incorrect; that bird appearing to me as being an immature marsh harrier, which its very superior size, and its wings being shorter than the tail, independently of other specific distinctions, evidently point out.

Among the smaller summer birds of passage which I have discovered as visiting our county, I may mention the common redstart and the garden warbler (*Sylvia Phœnicura* and *hortensis*), which are both found at Trebartha. I have also in my collection a bird killed near Penzance, which I suspect to be the female black redstart, (*Sylvia Tithys*). The grey wagtail (*Motacilla cinerea*), a winter visitant in the south of England generally, breeds annually on the banks of the Lynher in this county. EDWD. HEARLE RODD.

Penzance, October 31, 1840.

Note on the occurrence of the Squacco Heron near Penzance. I am surprised that one of your correspondents (Zool. 78) should say that only two examples of the squacco heron (*Ardea comata*) have

ever been found in England, when Mr. Yarrell says in his work, "This beautiful heron has now been taken in Somersetshire, Cornwall, Devonshire, Hampshire, Wiltshire, Suffolk, Norfolk, Cambridgeshire, and Lincolnshire. In several of the counties named it has occurred more than once." I have seen two preserved specimens, which have been procured near Penzance: one was shot eight or ten years ago, on the grounds of a gentleman of this neighbourhood; who tells me that another bird of the same species was seen at Hayle a few days after. The other example was shot at Scilly, in the autumn of 1842, and is now in Mr. Rodd's collection in this town.—*Alfred Greenwood: Penzance, March* 10, 1843.

Note on the Ring Ouzel. The ring ouzel (*Turdus torquatus*) arrives in considerable numbers on our moors at the end of March; usually frequenting the rocky hill-sides, but resorting to the neighbouring pastures to feed. It is exceedingly shy, and on being disturbed rises up to a considerable height, and often flies half a mile before it alights, uttering a note something like that of the blackbird. These birds usually build in crevices of the rocks, rarely in low bushes. I once saw a nest on Thorne Moor, built on the peat of a drain-bank. The nest is formed of coarse grass, plastered with mud and lined with finer grass. The eggs are mostly five in number, of a regularly oval shape, pale bluish green, spotted all over with light brown. The young birds are nearly like the females in colour; they acquire the adult plumage after the first moult. During the fruit season, the ring ouzels are very troublesome in the gardens on the borders of the moors, and occasionally visit those near the town. In July and August they unite in large flocks, feeding on bilberries and other wild fruits until the beginning of October, when they leave us altogether. I have not known a single instance of the ring ouzel remaining here during the winter.—Specimens with white feathers on the head are not of uncommon occurrence.—*John Heppenstall; Upperthorpe, near Sheffield, March*, 1843.

Note on the occurrence of the Bustard near the Lizard Point. I beg to apprize you of the recent capture in this county of a female great bustard, which was observed for many days in a turnip-field adjoining a large tract of open moor country between Helston and the Lizard Point. In point of dimensions it answers the description given by authors of females; but I observe that the whole of the neck and fore part of the breast is light bluish grey, the upper part of the head being the same, with a few brown marks; the under parts are not of a pure white, nor are the coverts of the wings, the white being

a good deal clouded with a shade of brocoli brown. This, I believe, is the first recorded example of the species in Cornwall. — *Edwd. Hearle Rodd*; *Penzance, March* 18, 1843.

Note on the occurrence of rare British Birds near Garstang, Lancashire. I was fortunate enough, about the 20th of October, 1842, to obtain two good specimens of the grey phalarope (*Phalaropus lobatus*, Latham), on the shore near to my own residence. One bird was taken alive in a net, placed in the night for sea-fowl near high-water mark, and for two days fed very voraciously on common worms. This bird did not appear in any degree alarmed by my presence when feeding, but ate the worms which I threw to it without even noticing me. It lived in confinement three days, and, I imagine, shortened its existence by making attempts to escape from its place of imprisonment. The other bird was shot, and allowed a party of us, four in number, to approach within twenty yards of it, without showing any symptoms of fear. We noticed it feeding, as we supposed, upon marine insects and small Crustacea; and during the time it was picking up its food, its wings were partially extended, and were kept in an incessant slight fluttering motion. Whether this is its general habit and posture of feeding, or whether it was owing, in some degree, to the very stormy day, I cannot say; but its fearlessness of danger from man was particularly remarked by us all. The same day, and very near to the same place, we had the good fortune to get Bewick's knot, or Selninger sandpiper, the purple sandpiper of Yarrell (Brit. Birds, ii. 665, *Tringa maritima*, Gmelin and Latham), which is a very scarce bird here: it also allowed us to approach within ten yards of it before it attempted to take wing. I attribute the appearance of these three scarce birds in this part, to the tempestuous weather which then prevailed, and which extended, I believe, over a considerable portion of the British Isles. On the 26th of October, 1842, I procured a specimen of the young of the golden eye, the Morillon of Bewick, (*Anas clangula*, Linn. and Penn.); and on the 14th of January, 1843, another bird, which I take to be the young male of the harlequin duck (*Anas histrionica*, Linn., Gmel., Latham; see also Yarrell, Brit. Birds, iii. 262). Should the preceding record of the occurrence of some rare British birds, be considered worthy of a place in your interesting publication, you will greatly oblige me by inserting them. —*Jas D. Banister; Pilling, near Garstang, Lancashire, March* 18, 1843.

Note on the early arrival of Martins in 1843. This morning I was surprised by the sight of several martins flying about and taking flies.

I cannot decidedly say whether they were the common or the sand-martin, as I had only a minute or two to observe them in, and they were flying high and the sky was bright. I could only see their figure, and not colour at all. I know they were not *swallows*, and had I seen them late in the season, should have called them common martins at once, as I do not remember ever to have seen a sand-martin since I have been here. They were not travelling, but sporting about backwards and forwards, and I believe them to have been the common martin. I never saw one of the tribe so early before by nearly three weeks, although I once had the luck, some twenty years ago, to kill a house martin, whilst snipe-shooting in the osier-beds at Wandsworth, on the 13th of November. Are you aware that there are no wrynecks in these parts? I have been here four springs, and never yet heard one, I must say to my sorrow, for to my ears there is something very pleasant and spring-like in their note, ugly as it really is.—*W. Wilcox; Bideford, Devon, March* 18, 1843.*

Note on the Sand-martin. Many a field-naturalist, reading the volume of nature, far removed from the society and converse of kindred spirits, will hail the appearance of 'The Zoologist' with feelings of the liveliest satisfaction: such, at least, are my own emotions, and in gratitude for the services it has rendered to naturalists and to the public at large, I beg to offer a few contributions to its pages. The first shall be a note on the sand-martin or bank swallow. Mr. White, of Selborne, mentions the solitary habits of this swallow, and in this his accuracy has been impugned, by at least two of his commentators. I have no reverence for names, no regard for writings that do not bear the impress of originality—that will not stand the test of truth. In the latter quality there can be no medium. What is 'The Natural History of Selborne' but the faithful record of a good man's life,—of a gifted, well-regulated mind, untainted by ambition, which never wished to ramble far from his native village? He never sought to rise to general laws; he wrote to support no system; he is, what he ever wished to be, the faithful faunist of his own province. His work will descend to future generations. Some, by overlooking the spirit —the *letter* of his work, have done him a passing injury, and thereby exposed themselves to ridicule. Did they ever tread the classic shades of Selborne? Did they question grey-haired men, who, perhaps searched the south-east end of the Hanger, on the 11th of April, 1781, for torpid swallows, how and where the sand-martin nestled in

* Communicated by William Wilson Saunders, Esq., of East Hill, Wandsworth.

the olden time? Has his accuracy been tried by this the one standard of justice — and was it found wanting? It gives me pleasure to be able to do justice to his memory: I know of three instances in this neighbourhood in which solitary pairs have scooped their nest, many miles distant from the larger colonies, and even these are composed of very few pairs. They are found in the banks of our mountain streams in their course through the lowlands, and in a sand-bank washed by the ocean's surge, to the westward of the basaltic rocks of Whitberry Point.—*Archibald Hepburn; Whittingham, March* 27, 1843.

Notes on the Swallow. Ten years have elapsed since I first read the pleasant monograph on the swallow, by the good philosopher of Selborne. The circumstance of its building in chimneys was, to me, both novel and astonishing. To this hour I have spared neither personal research nor enquiry to ascertain whether they frequent such situations in Scotland. The result is, that they have been known to breed in the chimney-stalk of steam-engines on different farms, but none of my friends or correspondents has ever heard of their breeding in the chimney of any dwelling-house or out-house in Scotland. Now instead of theorizing on this apparent anomaly, let me call the attention of field naturalists in the northern counties of Britain to the circumstance. Let them ascertain the geographical limits within which the swallow breeds in the chimneys of dwelling-houses, and thus elucidate this long-neglected point in its economy. Swallows usually depart from E. Lothian about the latter end of September. Last season, one was observed at Whittingham House on the 8th of November, and another at Tantallon castle opposite to the Bass Rock, on the 12th of the same month. This late residence of the swallow in Scotland is, I believe, unparelleled.—*Id.*

Note on the Migration of Birds. I have read with pleasure the many interesting notices which you have already published, of the effect which the mildness of the past autumn and early winter has exerted on the habits and migrations of birds. The following are a few of the more striking incidents which have occurred to me. When crossing a lonely moor in Lanarkshire on the 11th of October, I saw several fieldfares. A few days afterwards, Mr. M. Carfrae, preserver of animals to the museum of the Edinburgh University, told me he saw another flock about a month previously, at Lasswade, near that city: their early appearance is unprecedented with us. Observed a woodcock on the 17th of October; they have been very numerous this season, and so have the various species of ducks, but geese have been very scarce. Bramblings were uncommonly abundant. Observed a

solitary puffin at the mouth of the Tyne on the 10th of January; these birds desert our coasts at the approach of winter.—*Id.*

Note on an early nest of the Sparrow. A pair of sparrows built a nest and laid several eggs, at Markle, near E. Linton, about the 15th of December.—*Id.*

Note on the occurrence of Rare British Birds. I send the following note on the occurrence of a few rare birds for 'The Zoologist.' 1. Purple martin of Wilson, (*Hirundo purpurea*). Two specimens were obtained last autumn near Kingsbury reservoir, by Mr. J. Calvert, of Paddington. One of these is now in my possession, which I believe is a male. The only recorded notice that I am aware of, of this bird having occurred in the British islands, is in the second volume of Yarrell's 'British Birds,' p. 275: it is mentioned as having been killed near Kingston, Co. Dublin. 2. White wagtail, (*Motacilla alba*, Linn.) I was fortunate enough to obtain three specimens of this bird in May, 1841, on the banks of the reservoir; one of these is in Mr. Yarrell's collection, and was, I believe, the first British-killed specimen which that gentleman had seen. 3. Dusky redshank, (*Totanus fuscus*). A fine bird, in full adult breeding plumage, was killed here in June, 1841, and is now, I believe, in the possession of a gentleman at Eton. 4. Buff-breasted sandpiper, (*Tringa rufescens*); and 5. Wilson's petrel, (*Thalassidroma Wilsoni*). A specimen of each of these, obtained on the Sussex coast, have lately come into my possession. 6. Iceland or lesser white-winged gull of Yarrell, (*Larus leucopterus*). I saw in the hands of a bird-preserver a few days ago, a fine adult male, killed in Lincolnshire in the winter of 1841. It perfectly corresponded to Mr. Yarrell's description, except that the head and neck were streaked with pale brown, the bird being in its winter plumage.—*Fredk. Bond; Kingsbury, March* 28, 1843.

Note on the occurrence of the Avocet near Yarmouth. As the avocet, with some other birds of the same genus, is becoming every day more rare, a notice of its occurrence will not, perhaps, be unacceptable. A specimen in very good plumage, which by dissection I ascertained to be a female, was shot on Breydon, near Yarmouth, yesterday morning. It was wounded in the wing, and the man who brought it to me said that it ran very swiftly. The gizzard contained some of the small black beetles which abound in the mud-banks of the river, and what appeared to be the remains of shrimps, mixed with a good deal of gravel.—*Wm. R. Fisher; Great Yarmouth, March* 29, 1843.

Enquiry respecting the Water-rail. Yesterday, March 30, a water-rail (*Rallus aquaticus*) was caught on our Brighton chain-pier: it was

so completely exhausted as to be unable to fly again. I should be obliged by the opinion of any of your correspondents, as to whether this bird was on its way to or from the continent? Is it possible that having taken a long flight overland, it was resting here before crossing the channel; or did its extreme state of exhaustion proceed from having crossed? I believe many of these rails arrive in the autumn, and remain during the winter; and I have known but a solitary instance of the bird breeding in this country, which occurred at Ocford pond, near Godalming.—*Waring Kidd; Brighton, March* 31, 1843.

Anecdote of the capture of a Cayman.—

"I now took the mast of the canoe in my hand (the sail being tied round the end of the mast), and sunk down upon one knee, about four yards from the water's edge, determining to thrust it down his throat, in case he gave me an opportunity. I certainly felt somewhat uncomfortable in this situation, and I thought of Cerberus on the other side of the Styx ferry. The people pulled the cayman to the surface; he plunged furiously as soon as he arrived in these upper regions, and immediately went below again on their slackening the rope. I saw enough not to fall in love at first sight. I now told them we would run all risks, and have him on land immediately. They pulled again and out he came —"Monstrum horrendum, informe." This was an interesting moment. I kept my position firmly, with my eye fixed steadfast on him. By the time the cayman was within two yards of me, I saw he was in a state of fear and perturbation; I instantly dropped the mast, sprung up, and jumped on his back, turning half round as I vaulted, so that I gained my seat with my face in a right position. I immediately seized his fore legs, and, by main force, twisted them on his back; thus they served me for a bridle. He now seemed to have recovered from his surprize, and probably fancying himself in hostile company, he began to plunge furiously, and lashed the sand with his long and powerful tail. I was out of reach of the strokes of it, by being near his head. He continued to plunge and strike, and made my seat very uncomfortable. It must have been a fine sight for an unoccupied spectator.

"The people roared out in triumph, and were so vociferous that it was some time before they heard me tell them to pull me and my beast of burden farther in land. I was apprehensive the rope might break, and then there would have been every chance of going down to the regions under water with the cayman. That would have been more perilous than Arion's marine morning ride:—

"'Delphini insidens vada cærula sulcat Arion.'

"The people now dragged us above forty yards on the sand: it was the first and last time I was ever on a cayman's back. Should it be asked, how I managed to keep my seat, I would answer,—I hunted some years with Lord Darlington's fox-hounds. After repeated attempts to regain his liberty, the cayman gave in, and became tranquil through exhaustion. I now managed to tie up his jaws, and firmly secured his fore feet in the position I had held them. We had now another severe struggle for superiority, but he was soon overcome, and again remained quiet. While some of the people were pressing upon his head and shoulders, I threw myself on his tail, and by keeping

it down to the sand, prevented him from kicking up another dust. He was finally conveyed to the canoe, and then to the place where we had suspended our hammocks. There I cut his throat, and after breakfast was over, commenced the dissection."—'*Wanderings in South America, &c.*' *by Charles Waterton, Esq.*—p. 241, 2nd ed.

Note on the Cayman. By Charles Waterton, Esq.

My dear Sir,

The accompanying paper on the cayman by Charles Waterton, Esq., was sent me by that gentleman as one of several articles which I intend to appear in a second volume of 'Waterton's Essays on Natural History;' but as these will not be published for some time, and as the facts relating to the cayman are of immediate interest, I have Mr. Waterton's permission to send the article for publication in 'The Zoologist,' reserving of course the copyright, with a view to a second volume of the Essays.

I remain, My dear Sir,

Yours, &c.,

J. C. Loudon.

To the Editor of 'The Zoologist.'

The Cayman.

"The crocodile, in fact, is only dangerous when in the water. Upon land it is a slow-paced and even timid animal; so that an active boy armed with a small hatchet might easily dispatch one. There is no great prowess therefore required to ride on the back of a poor cayman after it has been secured or perhaps wounded; and a modern writer might well have spared the recital of his feats in this way upon the cayman of Guiana, had he not been influenced in this and numberless other instances, by the greatest possible love of the marvellous, and a constant propensity to dress truth in the garb of fiction."—*Extract from 'Lardner's Cabinet Cyclopedia.—Fishes.*'—ii. 111.

Swainson,—wholesale dealer in closet-zoology, was never in the wilds of Guiana, where the book of 'Wanderings' was written. Hence any comment on the above extract were loss of labour and of time.

His erroneous account of the cayman at once shows me that he never saw this animal in its native haunts.

I stop not here to tell the world how I came to incur the hostility of this morbid and presumptuous man. Suffice it to say that formerly, in friendship (for I personally knew his worthy father), I used to give him ornithological information. But his behaviour was such that I found myself under the absolute necessity of discontinuing my correspondence with him: and this laid the foundation of that animosity which at last has induced him publicly to call in question my veracity,

without fortifying his rash act with any proof whatever. Let me here inform this dealer in unsound Zoology, that my veracity is the only article upon which I feel that I have a positive right to plume myself, in the two small volumes which I have presented to the world. And now for the cayman; first, apologizing to the reader for this disagreeable though necessary prologue.

Those who have had no opportunity of examining the crocodile and cayman in the regions where they are found, may form a tolerably correct notion of them (making a due allowance for size) by an inspection of the little lizard which inhabits the warmer parts of Europe. And should they not have it in their power to travel out of England, they may still acquire a competent idea of these animals, by looking at the newt, which is common in most of our gardens: for, notwithstanding the frivolous objections which Swainson has offered to the contrary, I consider these monsters of tropical climates, neither more nor less than lizards of an extraordinary size, and in this the Spaniards agree with me;—for on their first arrival in the New World, seeing that the cayman was an over-grown lizard, both in form and habits, they called it "una lagarta," which is the Spanish name for a lizard.

The British, in course of time, having seized on the settlements formed by the Spaniards, soon became acquainted with the cayman, and on hearing the Spaniards exclaim "una lagarta" when this animal made its appearance, they, in their turn, called it an alligator; for so the two Spanish words, "una lagarta," sounded in the English ear. I got this information many years ago, from a periodical of which I remember not the name.

The little lizard which darts at a fly on the sunny banks along the roads of southern Europe, gives the spectator an excellent idea of the cayman in the act of taking its prey in the tropics; and whilst he views the pretty green creature turning sharply and quickly on the ground before him, he may see in imagination, the movements of the cayman on the banks of the Essequibo, after the dry season has set in.

I once fell in with a fry of young caymans on dry land near the river Essequibo. They were about a foot in length, and they twisted and turned in all directions with the agility of rabbits. One of them got entangled in the weeds. It fought fiercely before we succeeded in capturing it, and Daddy Quashi had it for his supper.

Crocodile is the eastern name, and cayman or alligator the western name for this huge lizard.

It is now high time to reject the many fabulous accounts of the cro-

codile. Their shedding tears, and their devouring the young ones as soon as hatched, are inventions only for the nursery fire-side.

Master Swainson's assertion that the crocodile "conveys its food to some hole at the edge of the water, where it is suffered to putrify before it is devoured," may suit an infant school, but it will be rejected with a smile of contempt by any one who has paid the least attention to the anatomy of the crocodile's head. The dissector would see that the mouth of this reptile is completely formed for snatch and swallow. Now any common observer of the habits of animals with a mouth so formed, must know at first sight, that these animals never eject food which has once entered the mouth. Down the throat it goes immediately, unless there be some impediment, as in the case of a stag's horns. Supposing for an instant (but no one except a second Master Swainson could suppose such a manifest absurdity) that the crocodile does really place its food in a hole until putridity commences; pray how is the animal to secure it from his ravenous fellow-crocodiles? — or by what process is he to curb his own hunger until the lardered morsel be ready for deglutition?

The old and hackneyed account of crocodiles devouring their own young when newly hatched, is really unworthy of refutation. Depend upon it, no such unnatural banquet takes place; for the crocodiles are never reduced to so abhorrent a necessity. The rivers which they inhabit abound with fish, both large and small; and on these the crocodiles feed, as well as on fresh-water turtle.

And as to the vultures watching individuals of the family of crocodile until they have laid their eggs, and then devouring them, it is an ancient fable, which, like Don Quixote's library of romances, ought to be thrown to the fire in the court-yard, and there burnt with the rest of the trash.

I can positively affirm that neither in the Essequibo nor in the Oronoque did I see one single solitary attempt of a vulture to invade the spot where a cayman had deposited her eggs. The cayman, in fact, may perform her task with impunity, whilst hundreds of vultures are standing motionless on the branches of a tree hard by, where they remain till hunger bids them be stirring, and then they all take wing and fly away in quest of carrion.

Had they been watching the cayman's treasures, they would have descended from the tree, and not have ascended in aërial flight.

The cayman not unfrequently lays its eggs in a heap of dry leaves. The eggs afford good nourishment to man. They are about the size of those of a turkey, perhaps somewhat larger. The outside of the

shell is rough, and of a dirty white colour. Probably it is quite white when first deposited.

This formidable animal being able to exist either in water or on the land, may be styled amphibious to the fullest extent of the word. Master Swainson, notwithstanding his "compassion for the poor animals," and his interested wish to make his readers believe that they are of a timid nature, would have found himself awkwardly situated had he been in my position when I attacked the cayman mentioned in the 'Wanderings;' — the Indians positively refusing to drag it out of the water, until I had placed myself betwixt them and danger.

I once saw a cayman in the Oronoque thirty feet in length, and another of the same size in the Essequibo. This animal is an inhabitant of the fresh waters, although occasionally he may be found in the mouths of rivers where the water is salt; but when this occurs we may conclude to a certainty, that he has been carried down the descending flood against his will.

Whilst I was in Guiana a cayman was killed in the salt water of the Essequibo, just opposite to the island of Waakenham.

We formerly learned from our nursery books that animals of the crocodile family have skins hard enough to turn a musket-ball. This requires explanation. No part of the cayman's body is absolutely proof against a musket-ball. Let it be recollected, that in shooting at one of these reptiles, we stand invariably above it, so that the ball from our gun, after striking the animal obliquely, flies off and merely leaves a contusion.

Although the back is very hard, the sides are comparatively tender, and can be easily pierced through with an ordinary pen-knife. The tail is not near so hard as the back, and singular to tell, the tail of the smaller kind, about five feet in length, is much stronger than that of the larger species.

In a creek up the river Demerara, I could any day see an adult cayman of this smaller species. It had chosen for its place of abode, a kind of recess amongst the flooded trees bordering on the creek; and it was so awake to danger, that I could not get a shot at it. After trying various and unsuccessful schemes to capture it, I took a curial at last just large enough to hold two people. I squatted in the prow, and Daddy Quashi steered it without making any stir in the water. Having cocked my gun, and placed it against my shoulder in a position ready to fire, the curial was allowed to drift silently down the stream, when, just as we got opposite the place where the cayman was lurking, I pulled the trigger and shot it. The whole of the afternoon

was spent in dissecting it, and I found it fully as tenacious of life as the land tortoise itself.

The mouth of the cayman is furnished with a most formidable row of teeth in each jaw, but they are peculiarly shaped for snatch and swallow. He has no grinders; hence no laceration of the food can take place in the mouth. But a contest will often ensue amongst the congregated reptiles, when the morsel is too large for deglutition; and then each individual snatches at what it can get, and pulls away the piece.

The nose of the cayman forms a pretty rotund figure. This, together with the rough protuberance which guards the eye from above, may be modelled by my new process, and rendered as elevated as it appeared during the life of the animal.

When Swainson tells us that the snout of crocodiles and caymans is unusually depressed, I know immediately that he has been at his wonted employment of examining a dried skin.

In dissecting a cayman for preservation, you may separate the tail at every other joint. This division renders the process extremely easy. The head also may be divided from the body, and replaced afterwards with great success.

After the whole of the dissection is finished, you steep the skin for about a quarter of an hour in the solution of corrosive sublimate, and then by means of sand you proceed to restore the form and feature which the animal possessed in life.

An adept in this new mode of preparing zoological specimens for Museums (see the Essays) would be enabled to bring home an alligator very superior indeed to those hung up in apothecaries' shops, during the life of Shakespeare. — "An alligator stuffed."

My cayman is now in as good condition as it was on the day in which I dissected it; and it will set decay at defiance for centuries to come, provided no accident befal it.

I have mentioned briefly in the Wanderings, an account which the governor of Angustura gave me of the boldness and ferocity of the cayman. I may here repeat the story somewhat more at length.

In the year 1808, I carried Lord Collingwood's despatches up the Oronoque to the city of Angustura, where the Spanish governor, Don Felipe de Ynciarté resided. I corresponded with him for some time afterwards. He was a soldier, of vast information in the Natural History of the country; and had been a great explorer in his day. He showed me a large map of Spanish Guiana, having made it from his own personal survey of those regions in early life. On the breaking

out of the revolutionary war, which, according to Canning's rambling speculation, was to give rise to a thousand republics, this true Spaniard fought for King Ferdinand VII. But fortune having declared against him he left the Oronoque, and retired to the island of Santa Cruz, where death closed his mortal career.

The Spaniards, who have more of pleasure than of puritanism in their composition, think it no harm, after they have performed the sacred duties of the day, to enjoy a fine Sunday evening, in gay attire, on the Alameda or public walk, where there is generally a band of music.

I had resorted to the walk attached to Angustura, and was in company with Governor Ynciarté, when he stopped on reaching a certain place, and begged my attention to what he was going to relate. "Don Carlos," said he to me, "mark the opening which leads to the Oronoque. I was on this very spot, a great number of the inhabitants being present, when there suddenly came out of the river an enormous cayman. It seized a man close by me, and carried him off to the water, where it sank with him to appear no more. The attack was so sudden and the animal so tremendous, that none of us had either time or courage to go to the unfortunate man's rescue."

This certainly could not have been one of Master Swainson's "slow-paced, and even timid animals," which "an active boy armed with a small hatchet" might easily have dispatched.

In 1824, I read in one of the newspapers at New York, a detailed account of the death of one of our consul's sons. The youth would bathe in the river Madalena, in opposition to all that the Spaniards could say against so rash an act, on account of the numbers and ferocity of the caymans there. He had not fairly entered the water, when he was seized by a cayman, and disappeared for ever.

How these dismal exhibitions of cayman ferocity, throw utter discredit upon what has been supplied to Lardner's 'Cabinet Cyclopœdia' on Fishes, vol. ii. p. 111 by Swainson! Had he ever seen any thing of the habits of the cayman, surely he would have paused before he informed his readers in Lardner, "we often met with them (caymans) in the same country as Mr. Waterton, (how comes this? Swainson was never either in Spanish or in Dutch Guiana, in which territories only I fell in with the cayman), but they were so timid that had they been disposed to perform such ridiculous feats as that traveller narrates, our compassion for the poor animals would have prevented us."

I have now given, as far as I am able, a true history of the cayman, without any exaggeration, quite free from Swainson's base accusation of my "constant propensity to dress truth in the garb of fiction;" and

I stake what little honour and credit I have hitherto gained with the public, on the correctness of it.

Should the reader believe me on my word, and then compare my account of the cayman with that which Swainson wrote for Lardner, he must evidently come to the following conclusion, viz. — that Swainson, when he wrote his account of this reptile, was either totally unacquainted with its habits and economy, or that he wilfully perverted them, and made out the cayman to be a slow-paced and even timid animal, in order to be revenged on me, who had described it as swift, and one of extraordinary ferocity: for, be it known, that in 1837, I found myself under the necessity of writing to Swainson, a very pungent ornithological letter, which was printed. He never answered this letter, and I thought that I had done with him altogether, till in 1839, whilst I was in Italy, out came Lardner's volume on Fishes, containing the sweeping extract which I have transcribed at the head of this paper. Swainson was then about to take his final departure to New Zealand.

Steam will soon convey to him a copy of this. I call upon him to contradict the statements which it contains, — or to acknowledge the truth and the propriety of them. CHARLES WATERTON.

Walton Hall, March 4, 1843.

Enquiry respecting the admission of Critical Papers into 'The Zoologist.' I am anxious to know whether, in 'The Zoologist,' you intend to admit communications of a general critical nature, on arrangements, natural systems, &c., which your correspondent thinks would materially advance the increasing importance of your periodical. —*Henry Walter Bates; Queen St., Leicester, March* 1, 1843.

[We shall be obliged for the opinions of our readers on this subject: we have no wish to gratify, in any branch of our editorial labours, beyond the very reasonable one of pleasing them.—*Ed.*]

Note on the capture of Vanessa Antiopa near Truro. Between the 1st and 4th of June, 1832, I took a weather-beaten specimen of Vanessa Antiopa in the woods of Tregethnan, the seat of the Earl of Falmouth, near Truro; but from the clay-coloured borders of the wings, and the extremely shattered state of the insect, I strongly suspect it to have been a French specimen, driven by the wind across the channel. I have been informed that in the Pyrenees the species is double-

brooded; and that in the autumn brood (which live through the winter) the border is white, but in the summer brood yellow. The same observer however told me that in Switzerland, where it is very common, he never saw a white-bordered specimen. It is very abundant in Nova Scotia, as I was told by the Rev. H. Spencer Slight; but all the specimens have the wings bordered with yellow. I have been informed that about ten or twelve years ago, a flock was seen in such numbers as to cover a field at Charlton-Kings, near Cheltenham; but the observer, being an unscientific person, captured only a pair from curiosity. A single specimen was seen, but not taken, at Weston-on-the-Green, Oxfordshire, in July of last year. — *Frederick Holme; C. C. C., Oxford, March*, 17, 1843.

Note on the capture of Moths on the Blossoms of the Ivy. I send you the names of a few moths taken from the blossoms of ivy near this place, in the autumn of 1842. I believe there is nothing very rare in the list, but I send it as a proof of the number of moths that may be captured in this way, and also as affording me an opportunity of offering a tribute of gratitude to 'The Entomologist,' to the plans recommended in which work I am indebted for almost all the insects I have taken. I anticipate an equally rich harvest from the blossoms of the sallows, a resort also unknown here before 'The Entomologist' reached us. Some of your readers may perhaps be glad to learn that a little later in the season the Noctuæ also settle on the blossoms of Buddlea globosa; but as this is not a very common plant in gardens, I fear the fact is not likely to be of general use.

List of moths captured on the flowers of ivy in 1842; with the dates of capture.

Scopelosoma satellitia, Oct. 5, 12
Orthosia lunosa, Oct. 6
Xylina semibrunnea, Oct. 7, 10, 14, Nov. 18
Orthosia pistacina, Oct. 7, 10, 12, 13, 14, 15, 17, 20, 24, 26, 27, 28, 29, 31, Nov. 1, 7, 18
Polia flavocincta, Oct. 8, 10
Caradrina cubicularis, Oct. 8
Amphipyra tetra, Oct. 8
Orthosia macilenta, Oct. 10, 20, 31, Nov. 1, 2
Euthalia miata, Oct. 10, 31, Nov. 7
Xanthia aurago, Oct. 12, 26
Rhizolitha Lambda, Oct. 14, 28, Nov. 7
Agrotis suffusa, Oct. 14, 15, 17, Nov. 1
Glæa Vaccinii, Oct. 14, 17, 19, 27, 28, 31, Nov. 1, 2, 4, 7, 18
Triphæna orbona, Oct. 14, 15, 17
Agrotis æqua, one male, Oct. 15
Triphæna pronuba, Oct. 15
Miselia conspersa, Oct. 15
Miselia Oxyacanthæ, Oct. 15, 19, 20, 26, 27. 28, 29, 31, Nov. 4
Botys asinalis, Oct. 15
Pterophorus pterodactylus, Oct. 15, Nov. 18
Phlogophora meticulosa, Oct. 17, 31
Orthosia flavilinea, Oct. 20, Nov. 18
Chesias dilutata, Oct. 20, Nov. 7

— *Robt. C. R. Jordan; Teignmouth, March*, 1843.

Note on the power possessed by Bees to raise a Queen from an Egg destined to produce a Worker. By J. D. Salmon, Esq.

Godalming, March 21, 1843.

Dear Sir,

It may not be uninteresting to the readers of 'The Zoologist' to be satisfied on a point of the economy of the bee, which has been questioned by different writers. I was able, during last spring, to verify the discovery of Schirach, that bees have the power, on the death or loss of their queen, to raise another from an egg that would otherwise have produced a worker. One of my hives unfortunately lost its queen on the 24th of April, a fact which I accidentally ascertained, by finding her Majesty dead opposite the hive. In the course of the morning the bees discovered their loss, when they became very restless, running about the alighting-board, and over the hive in all directions; and this they continued to do throughout the day, a few only still following their customary employ of carrying in pollen. The next morning I carefully examined the hive, but could not discover that eggs were to be found in any of the cells, all the brood being sealed up. On seeing this, I selected from another hive a piece of comb about four inches square, and full of eggs, and this I carefully placed amongst the other combs. In a short time the bees appeared to be more reconciled to their loss, and some few left the hive and returned loaded with pollen. In my examination of the hive I did not perceive a single drone, although much to my astonishment I had observed several to issue forth from this particular hive as early as the 3rd of March. That these drones had not been residents in the hive during the winter is quite clear, as I had previously observed several immature drones cast out, a fact proving that they had been recently hatched: this circumstance had probably some connexion with the death of the queen. On examining the hive on the morning of the 27th, I had the satisfaction of seeing that one queen-cell had been commenced upon the piece of comb which I had introduced: the next day the cell was much elongated, and on the 30th it was closed, as was also the case with several other common cells adjoining. It was not until the 4th of May that I again examined the hive, when I discovered there had been two additional queen-cells formed during the interval; one of them was sealed up, and the other, containing a large grub, remained open: this was sealed up by the following morning, as was the case with all other cells that contained the common brood. On the 10th I found a dead queen, not perfectly mature,

thrown out of the hive: upon this I examined the hive, when I perceived that the three queen-cells had been destroyed. I was not fortunate enough to discover the living queen, she having secreted herself amongst the interstices of the comb. On the 13th, about noon, I had the gratification of seeing a queen bee on the wing; after flying about for a few minutes she entered the hive. There was no drone on the wing at the time, nor had I previously seen any make their appearance from my hives, nor could I afterwards learn that those of my neighbours, within some distance, had at that early period shown any drones. The following day, at noon, her Majesty again came forth, and was absent for some time: I observed her to go in and out of the hive several times, the working bees paying her no attention. I did not examine the hive until the 27th, when I had the satisfaction of finding brood in various stages: some of the cells were sealed up, but I was rather surprised to observe that several of the worker-cells contained drone brood intermixed promiscuously. In due course of time the young bees were hatched, and amongst them were several small drones, only a trifle larger than the workers. On the 13th of June a swarm unfortunately selected the roof of a house for their domicile, and in attempting to dislodge them from this situation, the queen bee received so much injury, as to cause her death on the following day; I therefore added this swarm to the stock that had raised their queen. The increased numbers enabled them to progress rapidly, so much so that on the 10th of August I took a cape of delicious honey, weighing 12¼ lbs.; and in the following October this stock weighed 35 lbs., including the hive. This proved an ample supply of honey for their winter's consumption, for on the 13th of the present month (March) it weighed 23½ lbs., 11½ lbs. having been consumed during a period of six months. The hive is now in good health, and very strong in bees. In the early part of the spring of 1839 one of my hives sustained the loss of their queen, which they endeavoured to replace, there being at the time plenty of eggs &c. in the hive, by converting a common into a royal cell; and they eventually succeeded in hatching a queen, just fourteen days after they had sustained their loss, but she was so weak that she did not live more than a day or two: this weakness I suspect was owing to the absence of a sufficient supply of royal jelly at that early period of the year. I had several times tried this experiment, but could not before succeed. I remain, Dear Sir,

Yours very truly,

J. D. Salmon.

To the Editor of 'The Zoologist.'

Note on an Electric Centipede. About eleven o'clock on the night of the 23rd instant, I observed on the pathway of my garden a little blue gleam, like that of the glow-worm. Taking it for granted to be that insect, though wondering to find it in such a situation, I approached it. On stooping down I saw that the light was motionless, of an oblong form, about as large as a small kidney-bean. I could feel no insect, but picked up the luminous substance with my fingers, and placed it in my hand, where it still shone, although less brilliantly. Some of the luminous matter remained on the earth, disturbed and somewhat scattered by my fingers; over this the light played fitfully for a few seconds, and then gradually went out. On bringing in my capture to the candle, I could at first discover nothing but a pinch of damp earth; but presently observed a very common-looking, slender, almost white, centipede, crawling on my fingers, on which I doubted not that I saw, for the first time in my life, the electric centipede (*Scolopendra electrica*). I placed the insect in a box, and carried it into a dark room, but there was now not the slightest radiance; this, however, I have observed in the splendid fireflies of America (*Lampyris corusca*, &c.), whose light soon wanes, and is rarely renewed, in captivity. The next morning I put some damp sand in the bottom of a drinking-glass, on which I allowed my prisoner his parole, having first ascertained, however, that he could not crawl on perpendicular glass. I threw in a dead fly or two, on the juices of whose bodies I thought I once detected him in the act of feeding. Night came, but no luminosity; another, but all was dark; when I began to think I might have missed the true cause of the light after all, and that the presence of this centipede was merely accidental. He had been, however, slightly injured by the lid of the box at first. At last I thought that excitement might produce its light, and remembering the impatience and apparent distress that I have often seen manifested by insects when under the human breath, I breathed strongly on the centipede, and was pleased to see that it instantly became luminous through its whole length, writhing and throwing itself about in violent contortions, though at other times very inert. It quickly became dark again, and on repeating the experiment I found its influence became less and less, until it soon ceased to be affected at all by the breath: but after the lapse of another day and night, my breathing produced the same results as at first.—*P. H. Gosse; Hackney, March*, 1843.

Descriptions of the British Wasps. By FREDERICK SMITH, Esq., Curator to the Entomological Society.

THE object of my present communication is to describe the different species of wasps (of the restricted genus Vespa) which have occurred in Great Britain; and more particularly to point out the true Vespa vulgaris of Linnæus. As my opinions on this point differ from those of many distinguished entomologists, besides being at variance with established notions of specific distinctions, I deem it necessary to enter into a detailed account of that species, and to give several figures of it, in order more clearly to explain its variations.

Huber observes there are two sorts of females in wasp communities. There are certainly two sizes of what I have regarded as neuters, the larger being much less numerous than the smaller; in a nest which I took the proportion was as one to thirty. Except in size they were similar: the larger ones may probably be the small females stated by Huber to lay only male eggs.

It is stated in Kirby and Spence's 'Introduction to Entomology,' that wasps have sentinels at the entrance of their nests; and that if these be destroyed, the communication is cut off between the wasps within and those without the nest. I was curious to try the experiment; but in several instances I could not detect any wasp apparently on duty: however, in Plumstead wood, last summer, I saw a wasp at the entrance of a nest, sometimes walking an inch or two from the hole, and then going a little further in. This I thought very like the actions of a sentinel; so I got a piece of paling, and watching my opportunity I suddenly pushed it in an oblique direction into the ground, so as to cut off effectually all communication. The sentinel flew at me, but I captured him in a little time, as he was most perseveringly charging and recharging upon me, and seemed determined either to conquer or die; the latter was his fate. When I returned to the nest, a number of wasps had collected, and they were in no way inclined to let me approach unheeded, but flew about me, to all appearance intent on revenge. Perhaps the supposed sentinel, in his wide circumvolations while attacking me, had communicated the alarm.

Sp. 1. VESPA CRABRO, *Linn.*

It will be unnecessary for me to describe the hornet, that insect being so well known, and no difference of opinion existing as to its varieties constituting but a single species. I have not seen it in the north of England, nor heard of its occurring there; in the west, how-

ever, it is by no means a rare, although certainly a local, insect. It is plentiful in Hampshire, and flies boldly into houses in August and September. A few years ago, as I was walking by the side of Virginia water, by moonlight, I heard a loud booming noise, evidently caused by some insect darting rapidly by. I was for some time at a loss to conceive what this could be; at last I succeeded in knocking one down, when I found it was a hornet. By watching the flight of others, I soon discovered the tree containing their nest; they were carrying on their labours by the light of the moon, apparently quite as busily as if it had been open day. Late in the autumn hornets excavate deep holes in decayed trees, and in these they pass the winter.

Section I.—Ground Wasps.

Scape of the Antennæ yellow in front in the Males only.

Sp. 2. Vespa vulgaris, *Linn, Fab., De Geer, St. Fargeau.*

The common wasp (*Vespa vulgaris*). *a b* males. *c d* females. *e f* neuters.

Female.—Head black; clypeus yellow, with a black line down the centre, generally having its termination anchor-shaped, but sometimes a simple line, or an indication of a line, with one or three spots below, and, in rare instances, without spots; a crown-shaped spot between the antennæ, a line close to the eyes, on the face, and another on their outer margin reaching to the mandibles, yellow; the mandibles also yellow, their inner margin blackish brown. Thorax black;

an oblique line from the tegulæ to the collar, a spot under each wing, two on the scutellum, with a narrow line under each, yellow; all the femora black, yellow towards their apex; all the tibiæ yellow, with generally a rufous or black spot behind the anterior and intermediate; terminal joints of the tarsi ferruginous. Abdomen yellow, with a black band at the base of all the segments, the first band dentate in the centre, the rest with a black dot on each side, sometimes separate and sometimes united to one, two, or all the bands, forming dentations. Length 10 lines.

Sometimes the first segment has three triangular spots at its base, the central one being the largest, and the remaining segments have a black band, with separated or united spots. This variety is the Vespa germanica of Panzer. In some individuals the basal band is slightly interrupted, forming an intermediate variety.

Neuter.—Length $5\frac{1}{2}$ to 7 lines. Head precisely as in the female, admitting of the same variations in the markings on the clypeus. The thorax is the same as in the female, with the addition of two large ovate spots on the post-scutellum, making six, the two upper and the two lower being largest. The legs as in the female. The abdomen varies greatly in its markings. Var. 1. has three spots at the base of the first segment, a black band dentate in the centre at the base of the other segments, with a separated black dot on each side. Var. 2. has the three spots on the first, and the black dots united to the bands, forming dentations on the remaining segments. Var. 3. has a black band, dentate in the centre, at the base of the first segment, the rest with tridentate bands. Other intermediate varieties will be found, but the three described are those usually met with.

The Male is 7—$8\frac{1}{2}$ lines in length. It varies greatly. Var. 1. is the Vespa saxonica of *Linn. Fab.* and *Panzer*. Head black, clypeus yellow, with a black line down the centre having an anchor-shaped termination, or with a simple line, or three spots placed at right angles; a crown-shaped spot at the base of the antennæ, with sometimes a small black dot in the centre; a line on each side of the eyes yellow; the mandibles are yellow, their tips black; antennæ with the scape yellow in front. Thorax black, a line from the tegulæ to the collar, a spot under each wing, two on the scutellum, with a narrow line under each, yellow. Legs yellow, with the basal half of the thighs black. The abdomen has a black band, dentate in the centre, at the base of the first segment, the rest have a broad tridentate band at their base, except the apical one, which is unidentate. Var. 2. Head and thorax same as in var. 1. The abdomen has a black band

at the base of the first segment, the remaining segments have a basal band, and a spot on each side, sometimes separate and sometimes united, particularly to the second and third bands. Var. 3. has three spots at the base of the first segment, all the others have a black band at the base, dentate in the centre, with separated spots on each side.

From the difficulty I have experienced in making out the descriptions of previous authors, I have thought it necessary to give these detailed characters; in each instance mentioning the sex described, which appears to me a matter of considerable importance, especially in an insect whose varieties have been treated as species. On the subject of these varieties great difference of opinion appears to exist, and this seems attributable, not so much to variation in colour or appearance, great as this certainly is, as to occasional deviations from its usual economy.

In some of the most celebrated London cabinets an insect is ticketed Vespa vulgaris, which does not agree with the Linnæan description (although I shall prove it to be one of the varieties of that species), but corresponds with the Linnæan description of V. germanica. I have no doubt that some of the confusion at present existing is to be attributed to the occasional deviations from its usual or true habit, instances of which I shall relate.

The Rev. E. Bigge, M.A., in a paper read to the Ashmolean Society, February 27, 1835, containing some valuable observations on the economy of wasps, has endeavoured to clear up the difficulty respecting the true Linnæan V. vulgaris; but by adhering strictly to the habit pointed out by Linnæus, of forming its nest on beams in sheds, under the eaves of houses, or in low trees, has only made confusion greater. Mr. Bigge says "the species named Vespa vulgaris by Linnæus, is in fact the Vespa britannica." Now the latter insect will not agree with the Linnæan description,—"scutellum with four yellow spots, the abdomen yellow, the incisures with distinct black dots." V. britannica has but two yellow dots on the scutellum, and no distinct black dots between the incisures of the abdomen; and Linnæus would not have overlooked the large rufous patches which interrupt, laterally, the broad black band on the second segment of the abdomen of V. britannica. But I have no doubt Mr. Bigge overlooked the description, and relied solely on the situations selected for its nest, in which character I shall show it varies greatly, sometimes agreeing with, and at others differing from the Linnæan description.

In order to satisfy myself as to which was the true V. vulgaris, I took the whole of my collection of wasps to the Linnean Society's mu-

seum, where I was permitted to consult the Linnæan cabinet, and there I found a specimen ticketed V. vulgaris, agreeing exactly with the original description in the 'Systema Naturæ.' I next consulted the Banksian cabinet, named by Fabricius, and found a specimen with a ticket attached as V. vulgaris, precisely corresponding with that in the Linnæan cabinet, and agreeing with the description given by Fabricius. Seeing that the insects, as well as the descriptions of these illustrious authors, precisely agree, I think no better or more satisfactory evidence can be adduced.

The V. vulgaris of Linnæus is an insect, very variable, not only in its colouring and appearance, but also in its habits. The difference of colouring will be found on the abdomen and clypeus, in other parts it is pretty constant. I have given figures of some of the varieties of V. vulgaris; and it will be found, that out of these, four species have been made by different authors. Fig *c* (p. 162) represents a female of the V. vulgaris of Linnæus, Fabricius, Latreille and Panzer; fig. *d* is the V. germanica of Panzer, and perhaps of St. Fargeau, but as the last-named author does not mention the three spots on the first segment of the abdomen, I hesitate to speak decidedly. St. Fargeau's descriptions of V. vulgaris and V. germanica scarcely differ. He points out the "halbert-shaped" mark on the clypeus of V. vulgaris, but describes that part in V. germanica as having "one or three spots," which is a very inconstant character. He also remarks that V. vulgaris is rather the smaller insect, but I can detect no difference in this respect. Fig. *e*, a neuter, is, I have no doubt, the V. germanica both of Linnæus and Fabricius; the former says — "less than the common wasp," and the latter — "small V. vulgaris." Of this there are several specimens in the Linnæan cabinet. Fig. *b*, a male, I consider to be the V. saxonica of Linnæus and Fabricius; the descriptions of these authors precisely agree; both of them point out the yellow front of the scape of the antennæ. Fabricius also considers it a variety of V. vulgaris, and mentions the long prominent hairs upon the head and thorax. Panzer has also correctly named and figured it as V. saxonica.

I will now give my reasons for considering all the varieties figured and described to be one and the same species, — Vespa vulgaris. I have taken pairs *in copulâ*, in which the varieties were so intermingled as to leave no doubt on my mind about the matter. Thus, fig. *b*, a male, and *d*, a female, and fig. *a*, a male, and *c*, a female, have been found thus paired; and in Mr. Westwood's series of wasps, obligingly sent me for examination, I find the varieties represented by the

figs. *a*, *c* and *f*, taken from the same nest, which was found under the roof of a house: and in another instance the varieties *b*, *f* and *c*, from a second nest dug out of a bank. In the month of November I dug up a nest, and in it found thirteen females in a half-torpid state, collected together at the bottom; the individuals *c* and *d* were of this number.

It has been stated that there is a difference in the materials of which the nests are composed; that some nests are smaller than others, and of a more delicate texture. As regards size, I am aware that nests are not always found of the same dimensions, even in the autumn; neither are all the societies equally numerous in individuals. The differences in the texture of the nests arise, no doubt, partly from the nature of the wood used in their construction, and partly from the situation in which they are found. For although the ordinary situation for the nest of V. vulgaris is in the ground, yet it sometimes builds in outhouses, &c.; and I once found a nest in an old wooden pump, the entrance being at the hole in which the spout had been fixed: and Mr. Westwood has specimens from a nest constructed on the rafters of a house. With regard to the material used by wasps in the construction of their nests, that is, whether collected from decayed wood or sound timber, authors have given different accounts. During the last summer my attention was particularly attracted by a number of wasps, which were engaged in scraping their material from the wooden laths in front of an arbour, in a garden at Plumstead, in Kent: this wood was quite sound and very hard, as I found on cutting off a portion which had been shaved by the wasps. Again, in Plumstead wood, I saw great numbers similarly employed on some sound, hard oak paling. Still, in both instances, the wood had been exposed to weather, and it is only the surface of sound wood which they strip, for they may be observed to shift their position frequently, as if seeking the softer parts. But I have also seen wasps collecting materials from wood in so decayed a state as to crumble in the hand; and it will be found, on examining their nests, that the outer envelopes are frequently of a very different texture from the material used in the construction of the combs. I have a specimen, in which the outer leaf-like case is so fragile as to crumble at the least touch, and still the combs are of the usual firmness. The envelopes appear to have a considerable portion of decayed wood in them, mixed with layers of a different colour and texture: this nest was found in a barn. I think it will be found that if wasps meet with suitable material near at hand, most of the community in the same nest will resort to it. I observed an in-

stance of this in a colony of hornets, which had formed their nest in the trunk of a tree; and at the distance of about a hundred yards was an out-house, some of the posts of which were much decayed, and all the hornets appeared to resort to it: there was a constant flight to and from the out-house, and none were going in other directions.

Sp. 3. VESPA RUFA, *Linn.* and *Fab.*

The Female is 8—9 lines in length. Head black; clypeus yellow, a black line down the centre, with an anchor-shaped termination, sometimes the line is abbreviated, forming a simple dot; mandibles yellow, teeth dark ferruginous; a crown-shaped spot at the base of the antennæ, a line at the inner margin, and behind at the upper margin of the eyes, yellow; then down to the mandibles covered with silvery hair. Thorax black; the tegulæ with a line from them to the collar, a spot under each wing, and two on the scutellum, yellow; legs yellow, femora black, yellow at the knees, generally a black spot behind, on the anterior tibiæ. The abdomen varies in its markings; the first segment has sometimes a central and two lateral spots black, united by a ferruginous band, the second segment has a broadish band, dentate in the centre, uniting with a central spot, black, the remaining segments have separated black dots; in others, the black dots on the first segment unite, forming a subinterrupted black band, tinged with rufous, the spots on the second segment unite with the central dentation, the rest separated; the first and second segment vary greatly, one having more or less of a rufous tinge.

Vespa rufa. *g* male. *h* female. *i* neuter.

Neuter. — Length 5½—7 lines. Exactly agreeing with the female, admitting perhaps of greater variety in the colouring of the abdomen, the first and second segments being sometimes entirely rufous, with a narrow yellow margin.

The Male is 7—8 lines long. Head black; antennæ filiform, the scape yellow in front, otherwise coloured as in the other sexes; the two spots on the scutellum have generally an additional yellow streak under them; the abdomen is sometimes almost destitute of markings and entirely yellow, at others beautifully variegated with rufous.

This is an exceedingly beautiful and distinct species. It is not so

common as Vespa vulgaris, but is scattered all over the country; I have taken it in Yorkshire. I have observed that its nests are smaller than those of V. vulgaris, and its societies less numerous in individuals.

Section II.—Tree Wasps.

Scape of the Antennæ yellow in front in all the Sexes.

Sp. 4. Vespa holsatica, *Linn.* and *Fab.*

Vespa Anglica, Leach. *The Campanular Wasp*, Bingley.

Female.—Length 9 lines. Head black; clypeus yellow, with generally a minute black dot in the centre; scape of the antennæ in front, a line close to the inner, another on the upper part of the outer margin of the eyes, yellow; mandibles yellow, their inner margin black. Thorax black; a line from the tegulæ (which are black, having sometimes a small yellow dot), a spot under the wings and two on the scutellum, yellow; the third submarginal cell in the wings of this and the following species is widest towards the marginal cell: legs yellow, the thighs black, yellow at their apex, a black spot generally behind on the anterior tibiæ, terminal joints of the tarsi ferruginous. The abdomen has a black band at the base of all the segments, that on the second is widest and tridentate, the following are generally unidentate, the third also is sometimes tridentate.

Vespa holsatica. *k* male. *l* female. *m* neuter.

The Neuter exactly corresponds with the female. Length 6 lines.

The Male has the antennæ filiform, proportionably stouter than in V. vulgaris; in other respects, and in colouring, it corresponds with the other sexes, except that the abdominal bands are not so frequently dentate. Length 6—7 lines.

Linnæus appears to have drawn up his description from a specimen of the neuter, and he says "half the size of V. vulgaris."

Although I consider this species essentially a tree-wasp, still it sometimes constructs its nest in banks in the West of England. A friend of mine collected some tree-wasps for me in his garden in Yorkshire, and they consisted principally of V. holsatica; I also possess a nest which I took out of a gooseberry-bush: still I found a nest in

a bank at North End, Hampstead, and another in a similar situation opposite Sion House, near Richmond.

Sp. 5. Vespa britannica, *Leach.*

Female.—Length 7—8 lines. Head black; clypeus yellow, a black line down the centre terminating in a large anchor-shaped spot, the under side of the scapes, a crown-shaped patch between them, a narrow streak close to the eyes, another behind them at their upper margin, together with the mandibles, yellow, inner margin of the latter black; the antennæ are more or less piceous beneath. Thorax black; the tegulæ piceous; a line from them to the collar, a spot under the wings and two on the scutellum, yellow; wings slightly fuscous; legs yellow, femora black towards their base; a black spot generally on the anterior and intermediate tibiæ behind. The first segment of the abdomen has a black band at the base, slightly dentate in the centre, the second has a broad band, interrupted laterally by a large rufous patch, the remaining segments have black bidentate bands.

The Neuter is 5½—6 lines long. It corresponds with the female in its markings, but the abdominal segments have in some instances separated black dots.

Vespa britannica. *n* male. *o* female. *p* neuter.

Male.—Length 7 lines. Antennæ filiform, scape yellow in front, the underside of the remaining segments piceous. The thorax has two spots on the scutellum, a line from the tegulæ to the collar, and a spot under the wings, yellow; legs yellow, femora black, yellow at the knees. Abdomen as in the neuter.

I had a specimen of the neuter of this species given me as V. norvegica, which I think it cannot be, as all the describers of that species distinctly mention the immaculate scutellum, and all the sexes of V. britannica are distinctly bimaculate. Then it has been supposed to be the V. media of Latreille, and perhaps of De Geer, but it neither agrees with the figure nor the description of the latter author, and there is a specimen of the male in the British Museum, with a label attached, supposed to be in Latreille's hand-writing, which does not

agree with Dr. Leach's insect. I compared them carefully, and found the head in V. media, viewed in front, to be rounder, and the clypeus more square, the abdomen also wanted the rufous spots on the second segment.

Sp. 6. VESPA BOREALIS, *new species.*

Female. — Length 8 lines. Head black; scape yellow in front, a large crown-shaped spot rising from the base of the antennæ; the clypeus with three minute black dots; a streak close to the inner margin of the eyes, and another short one behind, yellow; the lower portion of the cheeks down to the mandibles clothed with silvery hairs; the mandibles yellow, their inner margin dark ferruginous. Thorax: the tegulæ, a line running from them to the collar, a spot under the wings, and two spots on the scutellum, yellow; the legs yellow, the anterior and intermediate tibiæ have a black streak behind, the apical joints of the tarsi ferruginous. The abdomen has on the first segment a triangular spot in the centre, and an oblong streak on each side, black, a black band at the base of the remaining segments; the second with an united triangular spot in the centre, and a short black streak on each side; a short black streak on each side of the remaining segments; beneath, the first, and a large square patch in the centre of the base of the second, black, a distinct black dot on each side on the other segments.

Northern wasp (*Vespa borealis*), female.

This insect resembles V. rufa in its general aspect, but the legs are longer and stouter, particularly the posterior pair, and the underside of the scape of the antennæ is yellow. I found it in the fir-woods in Yorkshire, where I have seen wasps' nests suspended from the trees; and I have no doubt this species builds there, as the Rev. F. W. Hope has received it from Mr. Selby (from the north of Scotland), who gives that account of its habits.

I possess a neuter wasp which I took at the same time and place as the females, but have no other evidence of their being the same species. It might prove to be an extreme variety of V. britannica, but it has four spots on the scutellum, and a triangular spot at the base of the second segment, instead of the square patch. Mr. Westwood also received two neuters from J. Hogg, Esq., one of which he presented to me, and it corresponds exactly with mine. I shall describe it, leaving it for future investigation to prove my supposition correct or otherwise.

Neuter, (V. borealis?). Head black; scape of antennæ beneath, a spot above the clypeus, a streak close to the inner, and another behind the eyes towards their upper margin, yellow; the clypeus yellow, with a black streak down the centre having an anchor-shaped termination; the mandibles yellow, their inner margin rufescent. The thorax as in V. borealis, with the addition of a narrow yellow streak below the two spots on the scutellum. The abdomen has a narrow black band at the base of all the segments, slightly dentate in the centre, the second broadest, a distinct separated black dot on each side of the remainder, except the apical one, which has a black line down the centre.

The nests of the tree-wasps are of a firmer texture than those of the ground-wasps, especially the combs: I have a portion of a nest of V. britannica which is particularly so: thus they are adapted to withstand the wind and rain to which they are, of necessity, exposed. I possess nests of two of the tree-wasps—V. britannica and V. holsatica; the former is about the size of a small orange, and the latter is only one inch in diameter, containing six cells; the foundress wasp was taken with the nest. The nest of V. britannica contains one layer of cells, thirty in number; nineteen contained pupæ when taken: this agrees with the description of a nest given by Kirby and Spence, and which was, without doubt, the nest of a young community. The outer leaves or envelopes in these small nests are capable of being opened like the leaves of a half-blown rose; thus, when additional layers of combs are formed, they would be expanded, and would form the covering of the lower portion of the nest. I suspect that all the nests recorded as having been found of this small size, were found early in the summer, or, if later, that some accident had happened to the foundress; for the nests would not contain more than about two hundred cells, and it must be remembered that the cells differ in size, according to the sexes they are intended to contain: and until I see cells of females and males in these small nests, I shall be of opinion that they are only early stages of larger nests, and that we have no perfect society of social wasp in this country, the nest of which is never larger than an orange. J. Hogg, Esq., of Stockton-on-Tees, in a communication to the Entomological Society, mentions having found one of these small nests. He also states that he has taken one late in the season; but I still consider that the circumstance must be attributed to one of the causes stated above. All the females taken with these small nests which I have seen, were either V. britannica or V. holsatica.

FREDERICK SMITH.

Note on the Capture of rare British Lepidoptera near Lavenham.
By Mr. W. Gaze.

Ballingdon, Sudbury, Suffolk,
Sir, April 22, 1843.

Having lately removed from Lavenham to this place, I send you a few short notes on my captures in Lepidoptera, in the neighbourhood of my late residence, during the last two years: and I may here remark that Lennage and Spelting woods, about two miles from Lavenham, are very rich in that order; and as they abound in a variety of wild plants, would (particularly in May and June) afford a rich treat to any entomologist or botanist visiting the neighbourhood.

Colias Hyale. Three specimens captured last autumn, (see 'Entomologist,' 387 and 416).

Leucophasia Sinapis. One specimen only taken in Lennage wood, August 17, 1842.

Nemeobius Lucina. One specimen only (a female) about two miles from Lavenham, May 31, 1841.

Melitæa Euphrosyne and *Selene.* In profusion in Lennage and Spelting woods, frequenting the flowers of the common bugle. Euphrosyne appears in May and Selene in June.

Argynnis Lathonia. Although I captured but one specimen (Zool. 30) I think I saw two others on the wing.

Argynnis Paphia. Two specimens in Lennage wood, August 17, 1842.

Cynthia Cardui. Very plentiful in September last year.

Thecla Betulæ. A few specimens in the neighbourhood of Lennage wood in September last year.

Thecla Quercûs. Very scarce during the last two years, though formerly abundant.

Thecla Rubi. A few specimens captured at Preston in May, 1841. It is a very local species, and appeared to frequent only about twenty yards of a hedge.

Polyommatus Argiolus. Only a pair taken; the female in June, 1841, the male in September. Abundant in this locality in May, 1836.

Thymele Alveolus. One specimen of the white-banded variety in Spelting wood: it is well figured in Messrs. Humphreys and Westwood's work.

Thymele Tages. Lennage wood, but rather scarce.

Macroglossa Stellatarum. Rather plentiful in my garden last summer, frequenting the flowers of the larkspur.

Sesia Fuciformis, (Curtis). One specimen taken and two others seen in Spelting wood, in May.

Ptilophora variegata. Two males taken from the blackthorn on the 18th and 24th of November, last year.

Trichiura Cratægi. Rather plentiful: the larvæ, which are very variable, feed on the hazel, white and black thorn.

Pœcilocampa Populi. Bred from larvæ, taken from the oak, ash and willow.

Gastropacha Quercifolia. Not rare.

Diaphora mendica. A female, which laid a number of eggs, from which I reared about twenty specimens of both sexes: the females vary much in the number of spots.

Xylina Lambda. Rather plentiful. It is a very hardy moth: I saw two specimens as late as the last day of December, 1842; and on the 1st of February, 1843, it again made its appearance.

Calocampa exoleta. A caterpillar found feeding on the hazel, but it died in the chrysalis.

Miselia Aprilina. Rather plentiful last year; the larvæ feed upon the oak.

Apatela Aceris. Bred from larvæ found on the sycamore, maple and hazel.

Xanthia flavago and *fulvago.* One specimen of each in Lennage wood.

Eremobia ochroleuca. Rather plentiful in several places in August and September, generally on the flowers or stem of the knapweed.

Mormo maura. Very abundant last autumn.

Cleora cinctaria. One specimen from an oak tree about two miles on the Melford road, on the 30th of April, 1841: it is larger and darker than my Kedington specimen.

Cidaria munitata. One specimen in Lennage wood on the 22nd of June, 1841, taken as it flew from the trunk of an oak.

Cidaria quadrifasciaria. I saw one specimen of this moth in my garden, but being unprovided with a net at the time, it escaped.

Polyphasia perfuscata. Three specimens by the side of Lennage wood.

Anticlea berberata. Took one specimen in my garden in 1841.

Anticlea rubidata. One, beaten from a hedge on the Sudbury road about a mile and a half from Lavenham, June 28, 1842.

Xerene albicillata. Lennage wood, in June, but rare.

Phibalapteryx tersata. Several specimens beaten from the same hedge and at the same time as Anticlea rubidata.

Eupithecia variegata. One specimen from the trunk of an oak, near Lennage wood, in April, 1841.

Bapta punctata. Rather common both years, throughout the neighbourhood.

Ptychopoda incanata. One specimen at Lavenham, August 23rd, 1842.

Acidalia osseata. One specimen at Lavenham, June 13, 1842.

Drepana hamula. One specimen on some water about a mile from Lavenham, on the Cockfield road.

Paracolax nemoralis. One specimen in my garden, June 14, 1842.

Lozopera Baumanniana. A few specimens in a pasture near Lavenham church, May 27, 1842.

Alabonia Geoffroyella. One specimen at Great Waldingfield.

Yponomeuta plumbella. One specimen in a lane at Preston, in July, 1841.

Nomophila hybridalis. Lennage wood in August.

Chætochilus sequellus. Two specimens, one in Lennage wood, the other in my garden, in October.

I am, Sir, Yours truly,

To the Editor of 'The Zoologist.' W. Gaze.

Note on Captures of Curculionidæ near Cambridge. The fine weather here has brought in a plentiful harvest, and insects of all descriptions are beginning to appear in abundance. My researches have been most successful, having never been out without an ample requital. Amongst the Curculionidæ alone I may enumerate the following captures.

Gymnaëtron Beccabungæ	Hypera murina	Orchestes calcar
Notaris acridulus	punctata	Otiorhynchus tenebricosus
Scirpi*	Anthonomus pedicularius	Sciaphilus muricatus
Dorytomus vorax	Apion carbonarium	Rhynchites nanus
Hypera Plantaginis	Pomonæ	

Were I to mention other Coleopterous insects I could enumerate many rarities, among which is a remarkably fine specimen of Dromius 4-signatus, and a great number of Mesosa nubila and Odacantha melanura.—*Vernon Wollaston; Jesus Coll., Cambridge, April* 8, 1843.

Note on Smerinthus ocellatus and Sm. Populi. If the following brief notice should be found worthy of insertion, it might prove interesting to some of your readers, as I

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*A single specimen of this insect was taken in a neighbouring fen. I did not capture it myself, but I understand it was brushed out of the sedge.

believe the occurrence to be of some rarity in the annals of Entomology. On opening my breeding-case on the morning of the 3rd of April, I found that a number of Lepidoptera had come out during the previous night, amongst which were three specimens of Sphinx ocellata, five of S. Populi, one S. Tiliæ, one S. Ligustri, and two of Cerura Vinula. But what surprised me was to find a male of S. Populi and a female of S. ocellatus united *in copulâ*. I left them all the night, and on the following morning the female had laid a number of eggs, which I am preserving, and hope to rear some hybrids, which will be somewhat of rarities. Perhaps some of your contributors may have witnessed a similar occurrence, where hybrids have been produced by two different insects, and will favour me with the particulars through the medium of 'The Zoologist.' The larvæ of S. Tiliæ and S. Ligustri I received last autumn from Hamburgh, not being found in this neighbourhood that I am aware of. The pupæ have been kept throughout the winter in a vinery.—*G. Norman; Hull, April* 7, 1843.

Note on Sphinx Ligustri and Smerinthus ocellatus. On opening one of the cages this morning, to my astonishment I found a male Sphinx Ligustri *in copulâ* with a female Smerinthus ocellatus: and what renders this still more singular, is, that there were several individuals of both sexes of the two species at the same time in the cage. —*Henry Doubleday, in* '*The Entomologist*,' *p.* 357.

Note on the production of hybrids between Smerinthus Populi and Sm. ocellatus. On the 6th of November, 1837, a paper by Henry House, Esq., was read before the Entomological Society of London, on the production of hybrid specimens between Smerinthus Populi and Sm. ocellatus: the specimens were exhibited.—*Ed.*

Note on the cure of "Grease" in Insects. If the following method of destroying the "grease" in insects would prove acceptable to the readers of 'The Zoologist,' perh aps you will be kind enough to insert it. Moisten the part greased with *pure naphtha*, then cover it with scraped pipe-clay; let this remain on for a few hours, afterwards brush it off with a soft camels' hair brush. Some of the large-bodied moths require to be done two or three times before all the grease is destroyed. I have used the naphtha and pipe-clay with great success in restoring the beauty of Coleoptera brought home in spirit, particularly those brought by Mr. Cuming.—*F. Bond; Kingsbury, April* 10, 1843.

Note on the Capture of Colias Philodice. In your remarks on Colias Hyale (Entomol. 386), you speak of Mr. Ardley's being convinced that he had seen C. Philodice; something more than this occurred in this neighbourhood, a specimen having actually been captured at Collyhurst, after a desperate chase of two hours, the pursuing parties having no other implements than their hats, and the locality being a very awkward one.—*R. S. Edleston, in* '*Entomologist*,' p. 417.

Note on Colias Philodice. In the last No. of 'The Entomologist,' (p. 417) was a notice of this insect. Although the circumstance of its capture eight years ago was known to most of the old entomologists here, on one of whom I thought I could depend for correctness as to the name of the species, I had no opportunity of seeing it myself until the end of last week, when I found out the residence of one of the captors, who showed me the specimen, and to my great surprise and disappointment, I found the insect was Colias Edusa and not Philodice. How parties who had ever seen the two insects could possibly confound them, I am at a loss to discover. I beg your insertion of this notice in the next 'Zoologist,' that the error may be rectified as soon as possible, and I greatly regret it should have occurred.—*R. S. Edleston; Manchester, April* 10, 1843.

Note on the capture of Nyssia hispidaria, N. zonaria, &c. On the 12th of March I went to Dunham park, in the expectation of meeting with the former insect at their

height on that day, and was not disappointed. About 11, A.M., they emerge from the chrysalis, and ascend the trunks of the oaks; and from that time until half-past 4, P.M., I captured forty-five males and eight females, notwithstanding that it rained incessantly all the time, accompanied with high wind, or I could have taken many more: among them were some beautiful varieties. It is a great peculiarity about this insect, its simultaneous appearance; so that unless the collector is at the locality on that day, his success is very doubtful afterwards, as but few stragglers are seen; what becomes of them I cannot tell. On the same day, with similar weather, a friend of mine was capturing Nyssia zonaria, so very local to Liverpool. This insect appeared in great abundance; to use his own words, "he could have captured five hundred specimens if he had wanted them." They leave the chrysalis at the same hour as the preceding species, but last much longer. Biston prodromarius, found also in Dunham park, was at its height on the 5th of April, leaving the chrysalis from 2, P.M., till 6. Although the park was well searched for some days afterwards, not a dozen specimens were taken, and those chiefly between the hours mentioned; thus proving the necessity of being acquainted with their hours of appearance if we intend to be successful in their capture. Larentia multistrigaria, Achatia piniperda, Anisopteryx leucophearia, and the true female, a very different insect to the female of Anis. stictaria, so frequently placed in cabinets for it;—these, and some beautiful varieties of Diurnea fagella, quite black, are the only insects worth recording that I have captured in this neighbourhood so far this season.—*Id.*

Note on the periodical occurrence of Colias Electra, Linn. [*C. Edusa*, Steph.] I see in the last 'Zoologist,' (Zool. 113) that the Rev. W. T. Bree has expressed surprise that the remarkably fine weather which we had last year (1842) did not produce Colias Electra as well as its congener, C. Hyale. Now, C. Hyale has been conjectured to appear every seven years, (Entomol. 388); and from the experience that I have had in catching C. Electra, which, in some seasons is a common insect on the cliffs in this neighbourhood, it seems to recur plentifully every fourth year, though scattered specimens may sometimes be caught in the intervening time. If this be the case, they will be found this year (1843), as they were very common in 1839. It is not, however, the experience of a single person from a single place that can settle such a point, but I was glad to see (Entomol. 385) that you mention their being found at the late Croydon canal in 1835, and again, Mr. Bree stating it to have occurred at Dover in 1831. Both these dates agreeing with mine, seem to show that when it appears in one part of the kingdom it appears in all: and I certainly think that if proper data were procured, the recurrence of several insects, whose appearance is now supposed to be irregular, might be predicted almost with certainty, as in the case of the Cicada septemdecim of the United States.—*Robert C. R. Jordan; Teignmouth, April* 18, 1843.

Note on the periodical occurrence of Colias Electra. My own memoranda tend to corroborate Mr. Jordan's views as to the appearance of Colias Electra in some abundance every fourth year, and particularly in 1831, 35, and 39, in which years it appeared simultaneously in many of the southern counties. This quadrennial appearance occurs in some degree with other insects, for instance, the common cockchafer and the goat moth; but in both these instances the insect is supposed to be four years in arriving at maturity, which can scarcely be the case with a butterfly. The occasional appearance of insects during the intervening years, does not militate against the quadrennial theory.—*Edward Newman.*

Note on the remarkable abundance of hybernating Butterflies. On Sunday last,

between Shooter's hill and Footscray, walking by way of Half-way-street, I saw an immense number of butterflies, which the warmth of the day had awakened from their hybernation. Every one knows that in the spring many insects appear which have remained torpid during the winter; but the number I saw on Sunday was quite extraordinary, there being hundreds of Vanessa Io, Polychloros, and Urticæ; the two first species being the most numerous. They were sporting and fluttering about, and sipping the honey from the flowers of the blackthorn, which was in great profusion. I counted four within a space of half a yard, and they were proportionally thick wherever a piece of blossom was to be seen. Gonepteryx Rhamni was in still greater number than any of the before mentioned species, and, with them, made a scene quite wonderful, and such as I shall not soon forget.—*J. W. Douglas;* 6, *Grenville Terrace, Coburg Road, Kent Road, April* 20, 1843.

Note on the occurrence of Coleopterous Insects during high Floods. Mr. Hewitson's graphic account of his captures of beetles during a flood, I can well believe, having once been witness to a scene somewhat similar. In the autumn of 1841, the Trent overflowed its banks, and for a time covered the greater part of our rich meadows. Having previously observed many beetles to be swimming about in the ditches, when the water was rising, I took advantage of the circumstance, and, equipped with a canvas net and a number of bottles, waded into the meadows where the water was just rising above the short grass; and great was my surprise to see that every "bent" of grass and every tall weed was completely covered with Coleoptera, clinging to each other like swarms of bees, forming, to those who are accustomed to "see great things in small," as lively a picture as possible of the alarm and confusion we may suppose were caused among our ancestors by the great deluge. My employment, whilst wading amid these drowning myriads, was merely to draw my net along the surface of the water, and to put the beetles, almost by handfuls, into the bottles; but even this, at last, grew wearisome, and I kept on carefully dragging my net, until it was half full of beetles and vegetable fragments: this I then rolled up and carried home, where it took all the spare time I could find on the three following days, to separate the entomological from the botanical contents, and to put the former into spirits. The locality I chose was at the foot of a high and well-wooded bank; this, no doubt, added materially to the number of insects in the adjacent meadow. I have not yet had time to sort out one half of the specimens I then put into pickle, but from what I have examined, I judge that I am much more fortunate than Mr. Hewitson in point of species, though not equalling him in the quantity of specimens captured. The species consist almost entirely of the Geodephaga and Brachelytra: of these there are many I had never captured before. But independently of the intrinsic value of the captures, there is a feeling of satisfaction acquired when one traverses a particular hunting ground during a flood, and sees its whole produce spread out before our eyes,—knowing that it cannot yield anything which is not immediately within our reach.—*Edwin Brown; Burton-on-Trent, April* 28, 1843.

Note on Entomological Collecting Boxes; with description of one on a new principle. Having devoted the greater part of my leisure time during the two past seasons to collecting the smaller British moths, I was led to try several methods of securing them when captured, in order to choose the best. I found that whenever I pinned small moths in an ordinary chip collecting box, they invariably, on warm days, became too much stiffened to allow of their being set in a neat and pleasing manner; nor would the relaxing box restore their pliancy sufficiently to prevent them from springing back

again when thoroughly dry. And to put each specimen alive in a separate box requires time, fills the pockets inconveniently, many of the specimens will die and become stiff, and all will damage themselves considerably by flying about; the boxes in which they are placed being constantly rolling over and over whilst in the pursuit of other game. The thought at length occurred to me to adapt the botanical *vasculum* to entomological purposes; and to this end I had made a small japanned tin box, about 9 inches long, 6 inches wide, and 1¾ deep. In the bottom of this box I put a thin sheet of cork, securing it by means of several tin points projecting from the sides. I then filled the box with warm water, and let it stand several hours, until the cork was well saturated with moisture, when, the superfluous water being poured off, the box was ready for use. Under the bottom, and also upon the *hinge* side, are two tin loops, through which, when I reach the hunting ground, I put two straps; one of these I pass round my neck, and the other round my waist, thus securing the box upon my breast with the lid opening from below. Here fixed, it leaves both my hands at perfect liberty, and does not cause any impediment to swift pursuit of insects on the wing. I used this box the whole of last season, and after a long day's chase in the hottest weather, I have never failed to bring home the smallest moth through which a fine pin could be passed, as flexible as if just killed: in fact I have frequently kept moths perfectly pliant in this box, until they have been covered with a fine flourishing crop of fungi. I have also a smaller box, made on the same principle, to put into my pocket when taking only a short walk. When not in use I keep water standing in them, so as constantly to have them ready for the chase. This kind of box is by far the best for relaxing dried specimens of insects of any I have tried; and for this purpose, as well as that for which I first had it constructed, I cannot sufficiently recommend it to the notice of entomologists.—*Id.*

Note on the use of the Lantern in capturing Moths by night. Many modes in which the lantern may be used with effect, have lately been pointed out, but one which I found very effectual last season, I have never seen noticed. It is—to choose the margin of a wood, well hedged, and the ditch filled with herbage, by the side of which I walk, holding in my left hand a small pocket lantern, with a bull's eye glass, secured by a ribbon round my neck; and in the other hand a hoop net. The moths will ever and anon make their appearance from among the trees, and will skirt along the hedge, and if the lantern be turned towards the wood, they may be struck with the net the moment they appear within the illuminated disk. By this means I have caught many species which could not be allured by a stationary lamp.—*Id.*

Notes on the capture and appearance of some of our rarer British Birds, in the County of Derby. By J. J. Briggs, Esq.

Golden Eagle, (Falco chrysaëtos). According to Glover, the historian of the county, the earliest notice of this bird being met with in Derbyshire occurred in the year 1668, when Willughby (a native of it) found an eagle's nest in the Woodlands, near the river Derwent, in the Peak. He describes the nest as being composed of large

sticks, one end resting on the ledge of a rock, the other on two birch trees, and covered with several layers of rushes and heath. On this nest lay one young one and an addled egg, and by them a lamb, a hare, and three heath poults. The nest was about two yards square, and, unlike the nests of other birds, quite flat. The young eagle was black, of the shape of a goshawk, and almost the weight of a goose, rough-footed or feathered down to the foot, and having a white ring about its tail. About the year 1720 one was taken up in the parish of Glossop, upon the high mountain called Kinder-scout, being found in a feeble state, said to be owing to the inclemency of the weather, as it afterwards recovered, and was carried about the country and shown as a natural curiosity. About seventy years ago one was seen in Hardwick park, a noble domain of his Grace the Duke of Devonshire. A full grown eagle of this species was shot between Cromford and Lea wood, about twenty years ago, which was presented to Peter Arkwright, Esq., of Rock House, Cromford, who had it finely preserved. The latest specimen seen in Derbyshire occurred in the winter of the present year (1843), at Matlock. It frequented the high and craggy rocks of that picturesque village, and more particularly the magnificent one called the High Torr, which, rising 300 feet above the valley of the Derwent, formed a noble throne for the monarch of air. This bird came during a severe snow, and remained a week or ten days, being shot at several times without success, and, we presume not relishing the indignity, flew over the summit in a most majestic manner (apparently unscathed), and was never seen afterwards.

The Osprey, (Falco haliaëtos). Melbourne Pool is an extensive sheet of water, covering an extent of ground little short of 40 acres, having its upper end "crowned with silver alders," intermingled with long sedge, and its southern bank skirted with tall firs and luxuriant chesnuts, which

> "Bend their green foliage shivering in the wind,
> To dip into its surface."

During the winter season this pool becomes the favourite abode of teals, snipes, ducks, and curious aquatic fowl; and the woodcock, a rare and uncertain visitant, has occasionally been taken here.* In

* For a notice of another rare and curious bird, shot off this water, the reader is referred to Mr. Yarrell's interesting and beautiful work, 'The British Birds,' vol. ii. p. 434.

1785, according to Pilkington, our county historian, an osprey was also killed here. Since that period another has been shot (I believe in 1835), a noble and beautiful bird, which, in a good state of preservation, is in the possession of Mr. Robinson, the Shaw, Melbourne. It was captured whilst in pursuit of its favorite prey, fish, being doubtless attracted to the spot by the appearance of a considerable sheet of water. An accurate observer, to whom I am indebted for many new and valuable observations, assures me that in October, 1841, he saw a bird of this species near Weston Cliff, soaring at a considerable altitude above the Trent, and that it was beating over the surface of the stream in as regular a manner as a pointer his shooting grounds. When a fish caught his eye he hovered on quivering wing for a moment, and then dashed down with great velocity into the stream, throwing up wreaths of spray in all directions around him. When a fish was seized, he bore it away in his talons to some distant spot to devour, and again returned to the scene of prey as before. Probably the fish taken by him were bleak or dace, as they are most frequently seen sporting near the surface. In the same month of the same year, an individual was shot a mile lower down the river, beneath Donnington Cliff, by the most noble the Marquis of Hastings, which probably was the bird before alluded to. It is preserved in his lordship's collection at Donnington park.

J. J. Briggs.

King's Newton, Melbourne, Derbyshire,
April 4, 1843.

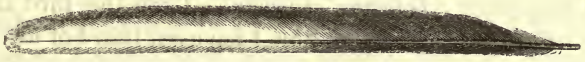
Note on the occurrence of rare Birds near Great Yarmouth.
By W. R. Fisher, Esq.

I beg to send you a list of the rare birds which have made their appearance here within the last two years: they consist chiefly of what are generally termed stragglers, but several species are included which migrate, at irregular intervals, in considerable numbers.

Honey Buzzard (*Pernis apivorus*). Five or six specimens, varying very much in plumage, were taken in Norfolk, about the end of September, 1841; two of these were shot near Yarmouth: another specimen was shot near Lowestoft, last autumn.

Blue-throated Warbler (*Motacilla Suecica*). One of these birds was found dead on the beach, September 21st, 1841.

Richard's Pipit (*Anthus Ricardi*). Was shot here November 22nd, 1841; another example in the following April: a third specimen was shot on the 24th instant, on the Denes, between Yarmouth and Caister, and within a few days of the time at which one of this species was met with here last year. It was shot by the same person who killed the last specimen, he having instantly recognized its loud note and peculiar manner of walking and feeding. These birds appear to vary considerably in size. Mr. Yarrell makes the length of the male bird six inches and three quarters.* The specimen killed here last April was said to measure seven inches and a quarter, while this bird measured, before it was stuffed, seven inches and five-eighths in length, and twelve inches in the extent of its wings. The lower mandible of the beak, when I first saw it, had a purplish tint, which has since changed to a dull red. The second outside tail-feather on each side, described as being in part dull white, and having the brown colour on the inner web extending over a larger surface than in the outside feather, has also in this bird a black shaft, which, being surrounded with white, forms, when the tail is spread, a very conspicuous mark on each side. The base of the outer web of this feather, of which I enclose a drawing, is also black, and the edges of the quill



Second outside tail-feather of Richard's Pipit.

feathers are light brown. I found it, upon dissection, to be a male. The gizzard was filled with several species of flies and gnats, amongst which I noticed the remains of the ladybird and of a species of ichneumon.

Hoopoe, (*Upupa Epops*). A specimen of the hoopoe was shot near this place on the 5th instant. At all times rare in this county, it is much more so at this season of the year, being generally met with in the autumn.

Kentish Plover, called here "Alexandrian Plover," (*Charadrius Cantianus*). A specimen (male) was brought me on the 17th instant. It was killed on a small lump of stones and shingle, which is, I believe, the only spot on Breydon left uncovered, except by very high tides. I mention this circumstance as corroborative of the attachment

* See Yarrell's 'British Birds,' i. 398.

which this bird is said to show to stony ground, in preference to sand or mud. It is very seldom met with here.

White Stork (*Ciconia alba*). As I was walking on the beach, on the morning of the 10th of May last, I observed a bird of this species coming over from seawards. When it first came over the shore, it was flying so low that I could plainly distinguish its long legs stretched out behind, like those of the heron, the black bar across the wings, formed by the quill feathers and wing coverts, contrasting strongly with the pure white of the rest of the plumage. I watched it for some minutes, as, after taking two or three turns over the houses, it slowly soared to an immense height, and then went steadily off in a south-westerly direction. It was shot the next day, about six miles from Yarmouth, and has, I believe, been since placed in the Norwich Museum.

Purple Sandpiper, here "Scandinavian Sandpiper," (*Tringa maritima*). The number of specimens taken varies very much every year. In 1841 I saw but one specimen, which occurred October 23rd. In 1842, from October 22nd to December 10th inclusive, it was comparatively common.

Buff-breasted Sandpiper (*Tringa rufescens*). A specimen shot here September 22nd, 1841.

Wood Sandpiper (*Totanus glareola*). I saw this bird at a dealer's August 23rd, 1841, since which time I have not heard of its occurrence.

Great Snipe (*Scolopax major*). Twelve or thirteen of these birds were shot in the beginning of September last, near Lowestoft. Three were killed on the 8th of that month, in one day, by the same party.

Grey Phalarope (*Phalaropus lobatus*). One was killed November 23rd, 1841; another November 2nd, 1842. One or two are generally killed every year about this time.

Black-winged Stilt (*Himantopus melanopterus*). Occurred here about May 7th, 1842.

Avocet (*Recurvirostra Avocetta*). Was shot in May and July last, and I have already communicated to you the late occurrence of this bird (Zool. 148), since which two more have been seen in Breydon, and one of them shot.

Hooper or Whistling Swan (*Anas Cygnus*). I saw three of these at a dealer's, on the 24th of last December. They were all apparently birds of the first year.

Little Auk (*Alca Alle*). A great many of these birds appeared in the latter part of October, 1841. One which had been taken by a

dog, on the Denes, was brought me alive, on the 27th of that month. I have not seen a single specimen this year.

I trust that the rarity of some of the species here enumerated, will be sufficient apology for the length of this communication.

WILLIAM R. FISHER.

Great Yarmouth, April 27, 1843.

Note on the effect of the late mild winter on the occurrence of Birds near Kendal. By THOMAS GOUGH, Esq.

I HAVE this week, for the first time, seen the four numbers of your 'Zoologist,' in which it is pleasant to observe much of the same kind of communications that gave such a charm to the early volumes of Loudon's 'Magazine of Natural History.'

Your invitation upon the wrapper of No. 1, to be supplied with contributions from all parts of the kingdom, and my own love of "Nature's works," induce me to court your acquaintance, and, as an introduction to you, I have enclosed a few remarks on the past winter and present spring.

The autumn of 1842 was remarkable for its continued dryness, the quantity of rain and number of rainy days in September, October and November, being unusually small. About the middle of October we experienced a severe fit of frost; indeed some of the nights and early mornings were fully as cold as they are in the depth of winter: nor was this low degree of temperature a mere matter of sensation, for on the mornings of the 20th and 21st a self-registering thermometer stood at 20°. This early appearance of frost promised well for the ornithologist; our lakes and inland *tarns* were visited by a number of ducks,—such as wigeons, golden eyes, tufted ducks and teals,—which generally arrive in flocks a month or six weeks later in the season.

The solitary snipe, an occasional winter visitor, was also more plentiful than I ever recollect previously, four or five specimens having been procured in the immediate neighbourhood of Kendal. This unexpected severe weather was, however, of short duration; the mildness which succeeded it, and continued, with one or two exceptions, through the season, prevented us having our accustomed influx of northern wanderers. The red-headed goosander has for many winters been a constant and plentiful visitor, birds both in mature and immature plumage being generally met with on fresh water; only

one specimen, however, has fallen under my observation during the whole winter, and that a female, killed on the 1st of December: about the same time a bittern was captured upon the peat-mosses, and soon afterwards I heard of three others occurring in the district. Bitterns are by no means annual visitors, nor is their appearance among us at all indicative of a severe winter; but when we are favoured with the company of this bog-hunter, a flock of eight or ten is generally scattered over the mosses and adjoining country. The only bird really new to *our* fauna was the hooded crow, a specimen of which was killed far inland in the early part of November. I am not aware that this species of Corvus has ever been seen before in this district, and this is the only fresh specimen which I have had an opportunity of examining. The woodcock arrived about its accustomed period. The same observations may be made respecting redwings and fieldfares. During the whole season a tolerably sized flock of these thrushes has never come under my observation. The jack-snipe appeared early; but our most experienced sportsmen complained that they never remember snipes and woodcocks being so scarce.

The 27th of December was one of the most delightful days that I ever remember in autumn. The redbreast sang with the freedom of his vernal song: the hedge-warbler and common wren were also very merry and musical, while the chaffinch, as if forgetful of what was to come, and apparently ready to join his partner in the choice of a nesting-place, repeated his *twink-twink-twink* so often and with such energy, that for some time I listened with trembling ears lest he should break forth into his sprightly song of February.

January, 1843, was much like December, very mild, with the exception of one week's frost. The habits of a few birds afford me a scale of comparison between the January of this and other years: of these the grey wagtail offers an interesting illustration. This species is a permanent resident with us; at least its migrations are confined to a distance of five or six miles upon the banks of our river. In summer it may be met with about two or three miles above the town, in its breeding places, upon the more rugged and wooded parts of the rivers Kent, Mint and Sprint. In autumn the birds, old and young, draw nearer the town; and perhaps, as winter approaches, part may leave us entirely, but the majority remain the year round. Should the winter be mild, its autumnal quarters are never forsaken; but if a severe frost set in, and cover over all its usual haunts with ice, after having for some days vainly endeavoured to gain sustenance about the sluices and bridges, these birds retire to a deeply sheltered part

of the river, two miles S.W. of the town, called Hawes-hood. Beneath the dripping ledges of shelving limestone which wall in this secluded spot, the whole band of grey wagtails, picking up a scanty living, make a temporary sojourn. Should the weather become milder, they soon return to their favourite haunts ; but if the cold increase, and be accompanied with drifting snow storms, so as to drive them from these retreats, our feathered friends make another move, and, steadfast still to the locality, again appear amongst us. But the river is now entirely quitted. The outlets of conduits, and the open channels in retired yards of the town, are their refuge from the storm. Such was the case in January, 1842, but during the past, the grey wagtails have never wandered from their autumnal residence : about the middle of February the male birds become very noisy: in the latter part of March both sexes, in pairs, move up the river and its tributary streams; and in the last week of April they may be again found in their breeding quarters. THOMAS GOUGH.

Kendal, April 13, 1842.

Notes on the habits of certain Birds. By ARCHIBALD HEPBURN, Esq.

The Jackdaw. The Rev. Mr. Stanley, in his pleasant work entitled 'Familiar History of Birds,' mentions a certain beechen wood which was inhabited by a colony of jackdaws, but whether they built only in the hollow trees or amongst the branches does not appear. I have seen no mention of the latter fact in any of the few ornithological works which I have read. On the 13th of June, 1841, whilst walking in Binnie wood, in company with two friends, we had just emerged from a noble grove of beech trees, on a glade where the woodman's axe had been busy, when the lively cawing of a jackdaw awoke the deep stillness of the wood, and eager to learn what the garrulous, social bird was doing in that lonely place, we walked to the foot of the tall Scotch fir whence the sound proceeded ; there we found the dead body of a young jackdaw, and heard the grateful chatter of another: on looking upwards to the bushy, unnatural growth of its branches, we perceived a bulky nest, whence the old daw speedily made its escape. Professor Macgillivray mentions that it frequents the ruined castle which frowns above the landing place on the Bass: I have also observed several pairs nestling in the cliffs on the north side of the same rocky isle. Although fond of the

society of its fellows, in the old grey church tower, the ruined castle, the beetling cliffs, the comfortable stack of chimneys, yet there was an old hollow ash tree in one of our fields which at different times was tenanted by a solitary pair: they were all destroyed in succession, but the epithet of "the daw's tree" recorded the simple tale, till it, in its turn, fell by the hand of man.

The Red Grouse. On Monday, January 17th, 1842, I heard of a most remarkable deviation from the usual habits of its species, in the case of a female red grouse, a bird, the very mention of whose name recals to memory the brown heath, and its bold challenge from the hill side. Familiar as I have been for many years past with their habits, I should have been the last to imagine that in any instance one of this species would voluntarily leave its native haunts, and take up its residence amongst drifting sand-hills, overgrown with bent grass (Agrostis), such as stretch along our coast from Whitberry Point to Scoughall Burn, about *six* miles as the crow flies, from the nearest heath-clad slope of the Lammermoors. It was here that a *solitary* female was seen in the winter of 1841; and in the following summer, Mr. Martine, gamekeeper to the Earl of Haddington, found her attended by a brood of young ones, which arrived at maturity, and frequented their native haunts for several months, till the whole were killed by poachers or otherwise disappeared. Having at different times, in all seasons and in all weathers, wandered in its usual haunts, I am enabled, in some measure, to appreciate the beautiful accuracy displayed in my friend Professor Macgillivray's account of its habits. From his long practical acquaintance with this bird in the Hebrides, where sand-hills, covered with bent, abound, there is some reason for inferring that perhaps the above-mentioned fact is unparalleled.

The Pheasant and Partridge. Every one is familiar with the parasitic habits of the cuckoo, but I dare say few have heard of a very anomalous proceeding on the part of the pheasant and partridge. My attention was first directed to it on the 8th of June, 1840, by a mower calling upon me to examine a nest from which he had just driven a female pheasant, and which contained seven partridge's eggs in addition to nine of her own. On mentioning the circumstance to the gamekeeper, he averred that it was not uncommon, his assistants corroborating the statement: Mr. W. Martine, a native of one of the midland counties of England, gamekeeper to Mrs. H. N. Ferguson of Biel, informed me that he had long known the fact, that it was by

no means of rare occurrence, that the pheasant is invariably the intruder, driving off the partridge, sitting on both sets of eggs, and attending to the broods when hatched: the partridge, on the other hand, only takes possession of the pheasant's nest and eggs when forsaken by their owner; amongst these she deposits her own, broods over all, and is by far the best nurse of the two. It is a pity that I did not take note of the position of the eggs in the nest which I examined; it would be interesting to know whether or not the foster parent placed her adopted eggs on the outside of the nest.

The Black Grouse. On the 12th of April, 1843, when riding over the green hills which divide the head waters of the Teviot from those of the tributaries of the Esk, I rested for two hours at the inn of Mosspaul; there, on a sloping hill, I noticed a pack of black grouse, consisting of *three* males and eleven females, feeding within 150 yards of the inn door and 50 yards from the highway on which I stood: one of the former lowered his head, depressed the tips of his wings, erected and expanded his tail, now and then bending it on one side like a turkey-cock, and, strutting about in pompous style before the females, uttered a loud, rumbling, guttural, and at first generally querulous and then rolling note, which, in that quiet narrow glen, was easily heard at the distance of a quarter of a mile: it would be difficult to syllable such a note; the snarling of a mastiff, omitting the nasal part of the performance, gives a pretty correct idea of the rolling notes. The proud bird was a haughty wooer, for aye as each female fled from his importunities, after pursuing her a short way, he paid his addresses to another: it is a curious fact that, although the amorous chase often brought him into close contact with the other two males, who remained silent and unconcerned spectators of his fooleries, *not the slightest animosity was manifested by either party.* A stage-coach dispersed the pack; two males and eight females flew across the glen; on alighting, one of the former recommenced his gestures and notes, and occasionally uttered a loud, harsh, hissing squeal or scream. By reason of his importunities, as well as to obtain food, the pack soon became scattered, so he was obliged at times to fly from group to group of coy females, scarcely ever intermitting his curious cry when on the ground. A man at the inn informed me that these notes and gestures usually commenced about the middle of March, and ceased in the course of eight or ten weeks. I observed their habits most attentively during the space of an hour and a half, noting down everything of interest, and although this account may

differ from that given by other observers, it is too brief, and stands too much alone, to justify any one in contradicting their statements: I offer it then, in the earnest hope that it may induce abler naturalists to inquire into the general accuracy of the short note on the habits of the noble black grouse during the breeding season. During the remainder of my solitary journey through some of the wilder districts in the south, I listened in vain for its well-remembered note, having only once again heard it on the hills on the left bank of the Esk, below Langholm. ARCHIBALD HEPBURN.

Whittingham, East Lothian,
April 26, 1843.

Note on the occurrence of the Black Redstart near Brighton. On the 16th of October, 1839, I shot a black redstart on the walls of the conservatory at Hove, near Brighton; and, on the 3rd of December following, another on the wall at the back of Mr. Vallence's malthouse; since which I have shot four other specimens, three males and one female, one of the males during the last month; it was remarkably black and bright.—*Geo. Swaysland; Brighton, April* 12, 1843.

Note on the occurrence of the Golden-crested Wren at Sea. On the 25th of October, 1839, a fisherman brought me two specimens of the common golden-crested wren, which he said he had caught forty miles from land.—*Id.*

Note on the appearance of the Continental White Wagtail (Motacilla alba) at Falmouth. Observing on the 10th instant, amongst a flock of wagtails, on a beach near here, a bird, the peculiar appearance of which led me to believe it a Motacilla alba, I procured a gun and shot it, when it proved to be that species in perfect summer plumage. This bird I forwarded to W. Yarrell, Esq., who confirms my opinion of it. On the following day I obtained two other specimens from the same place. They are certainly strangers to this neighbourhood, and probably arrived in company with the swallows, which appeared for the first time on the 10th. — *James J. Trathan; Falmouth, April* 14, 1843.

Note on the occurrence of the Bohemian Chatterer near Teignmouth. A female Bohemian chatterer (Bombycilla garrula) was shot near Kingskerswell, on the 20th of January, 1829, and shortly afterwards a male of the same species at Ashburton.— *W. R. Hall Jordan; Teignmouth, April* 17, 1843.

Note on the occurrence of the Rose-coloured Thrush at Teignmouth. A specimen of the rose-coloured thrush (Pastor roseus) was shot at Teignmouth on the 17th of July, 1817.—*Id.*

Note on the occurrence of the Brambling or Mountain Finch near Farnham, Surrey. This bird appeared in immense numbers in the neighbourhood of Farnham during the last winter, while for many years previously single specimens had only occasionally been met with.—*J. Lewcock; Farnham, April* 21, 1843.

Note on the occurrence of the Tree Sparrow at Tilford, Surrey. I saw during last winter a great number of the tree sparrow in a field at Tilford: we have always considered this bird an unfrequent visitor: on examining the craws of about twenty individuals I only found one which contained any corn — two or three barleycorns; those of the others contained upwards of fifty seeds of weeds which were growing in the neighbouring fields: the same was the case with the bramblings.—*Id.*

Note on the Woodcock's breeding in the Holt Forest, Hampshire. I have known the woodcock to breed in the Holt Forest for the last ten or twelve years, although they are perhaps scarcely so numerous now as they were a few years back: I recollect about eight years ago there were two broods in one enclosure.—*Id.*

Note on the Crossbill's breeding in the Holt Forest. Four or five years ago the Scotch firs in the Holt Forest were cut out, to allow more room for the growth of the young oaks: when the trees were thrown, four nests of the crossbill were found in their topmost forks: the nests and eggs had much the appearance of those of the greenfinch. Since the firs were cut I am not aware that a single crossbill has been seen in the forest.—*Id.*

Note on the occurrence of the Wood Sandpiper at Penzance. On the 21st instant a male specimen of the wood sandpiper (Totanus glareola) was shot on the sea shore, immediately below the town of Penzance. I am not aware of the occurrence of this species in this neighbourhood at an earlier period of the year than the above date, although I have an example which I obtained in the middle of December, 1837, and would, in all probability, have remained through the winter if permitted to live. I suspect that this perennial trait is accidental rather than specific, inasmuch as the individuals which have come under my notice have occurred at the periods of the year when a migratory movement may be looked for. Thus, on the 20th of May, 1840, a female was killed at the Land's End, in which were the rudiments of eggs. In June, in the same year, another was killed in the same locality; and in the month of August, in the same year, a flock of seven were all killed in the same parish, which proved to be birds of the year, characterized by the dorsal spots being tinged with buff yellow, the colour in adult birds being pure white. At this period of the year, I have observed that birds of the Tringa, Totanus and Limosa genera, which migrate from the Continent, as well as from our own county — northward, to breed, commence their *return* movement very *early* in the autumn, and the *first* flights consist almost entirely of the *young birds of the then year*. I may instance especially the knot and the bar-tailed godwit, in illustration of these remarks, as applicable to our western shores; and what I have said respecting the wood sandpipers will, I expect, be received as exemplifying the genus Totanus, but I may add also, that all the specimens of the Tot. calidris obtained at this season of the year, in this neighbourhood, have been always or nearly always in immature plumage, the feathers being margined with white.—*Edwd. Hearle Rodd; Penzance, April* 24, 1843.

Note on the occurrence of the Squacco Heron near Penzance. The week before last a very interesting specimen of the squacco heron was brought to me, in a far more adult state of plumage than those (and there have been two) that have come under my notice, as killed in Cornwall. The occipital and dorsal plumes, in the present individual, had commenced their development, and I observed that an active, although partial, moult was taking place. I say moult, but perhaps if I were to say *accession of feathers* it would be more strictly correct, as I could not observe that the plumage displayed any raggedness or feebleness of feather, which is to be seen at the autumnal

or general moult. From these new feathers, or stumps of feathers, were emerging the plume-like feathers which in another month would have given the bird her full ornament: one or two of the occipital plumes were grown out, and the rest visible. It is a question, therefore, detecting the bird *at this period of the year* in this state, whether or not these plumes are not characteristic of summer livery, and whether they are not shed at the autumnal moult. I have, at least, thought it worth while to give you an opportunity of recording what I consider may be just desirable for your readers to know. On the craw of this bird being opened it was found to contain a shrew mouse, in an entire state, and also the remains of many Coleoptera.—*Id.*

Note on the early breeding of the Ring Plover. The ring dotterel (Charadius Hiaticula) appears to be an early breeder, from my having received this day two eggs from the Scilly Islands.—*Id.; April* 25, 1843.

Note on the occurrence of Richard's Pipit in Cornwall. Thinking information respecting so rare a bird as Richard's Pipit (Anthus Ricardi) would be interesting, I send an account of some captures that have taken place here, as I am not aware they have appeared in any publication. Mr. Vingoe shot four of these birds; two at one shot near Marazion, and two near his own house at Penzance. He states that he saw one perching upon a small rail, though it has been denied that this species ever does perch. Their actions and note he thought similar to those of the other pipits, but perhaps a little approaching to those of the wagtails. Several ornithologists give the whole length of Richard's pipit about 6¾ inches, the same as that of the rock pipit (Anthus petrosus), whereas none of the birds killed here, all of which I have seen, measure less than 7½ inches; and, from their tarsi being a little longer in proportion than those of the rock pipit, they have a considerably larger and taller appearance than that bird.

The following are some measurements of the largest bird of the four:

	IN.	LIN.
Whole length	8	0
From the carpal joint to the end of the wing	3	11
Length of tarsus	1	2¾
Ditto bill from centre of nostril	„	5½
Hind toe	„	6½
Hind claw	„	9

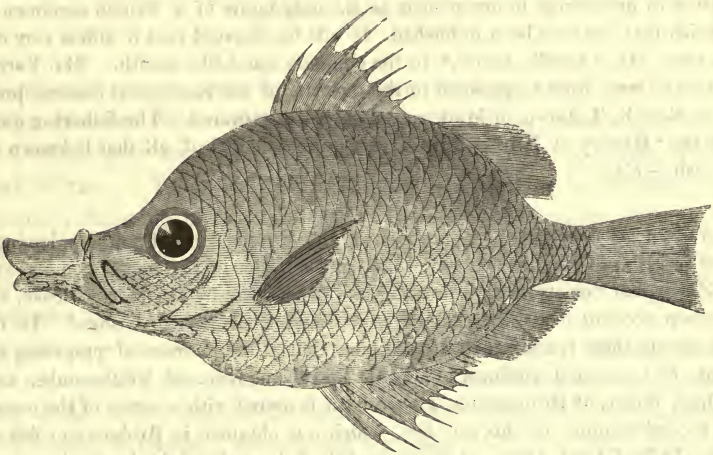
This species appears to be equally rare here and upon the Continent: where is its natural habitat?—*A. Greenwood; Penzance, Cornwall, April* 25, 1843.

Note on the Pied Wagtail. In a preceding paper on the pied wagtail (Zool. 137), I endeavoured, in as condensed a form as possible, to offer the result of my observations on the migration and local distribution of that bird in Sussex. I have now to add, that after carefully examining and dissecting a great number of recent specimens, during March and April, I am still of opinion that the males do not acquire the perfect adult dorsal plumage until after the second spring moult; and the same remark applies in a certain degree to the females, many of which, after assuming the breeding plumage, are of a lighter colour than others. On the 14th of April I shot two pied wagtails which appeared to have a nest, and which, externally, resembled each other so closely, that it was not easy, until after dissection, to ascertain that they were male and female. The latter I conceive to have been an old bird, and the former a male of the preceding year.—*A. E. Knox; New Grove, Petworth, April* 29, 1843.

Note on Birds in June. Some few of the waders — such as the sanderling, bar-tailed godwit, knot, &c. — remain on our shores up to this time, and their summer plumage is now perfect: a few of them only breed in this country, by far the greater part repairing to the arctic regions for that purpose. —*Van Voorst's Naturalists' Almanack for* 1843.

Note on the occurrence of the Boar-fish at Brighton.

By Waring Kidd, Esq.



The Boar-fish (*Capros Aper*).

Thinking that some account of a rare fish that was found on our coast would be interesting to the readers of 'The Zoologist,' I send the following brief notice. On the 6th of March, 1842, a fish, 6½ inches in length and 3 inches in width, of most brilliant colours, was picked up by a fisherman. It was alive when found: the colours were bright orange and lake. The fish was taken by the person who picked it up, to Mr. Griffins, the principal fishmonger of this place; he took it to the Pavilion, where it was presented to Her Majesty. It was immediately recognized by His Royal Highness Prince Albert (the Prince being a good naturalist) as the boar or hog fish of the ancients, a species very scarce on the British coasts. His Royal Highness, wishing to have it preserved, sent it here; as it was for Her Majesty, it gave me great pleasure that I succeeded so well, both in preserving the colours and in showing the peculiarity of the mouth, which the

fish has the power of extending and contracting at will. When extended, it takes the form of a hog's snout, hence the name of boar-fish. I suspended the fish under a glass shade, and placed a few sea weeds &c. on the stand. When quite completed, I made a painting of it, and succeeded in representing the colours pretty correctly. I shall be most happy for my performance to be shown to any of your correspondents who will call at No. 3, Cranbourn St., Brighton.

WARING KIDD.

Brighton, April 12, 1843.

[Our correspondent having with great kindness forwarded to us his painting of this rare fish, our artist has made a very accurate engraving from it, which we have much pleasure in presenting to our readers as the only figure of a British specimen of the boar-fish that has ever been published. It will be observed that it differs very remarkably from Mr. Yarrell's figure,* in the elongate snout-like mouth. Mr. Yarrell's figure was drawn from a specimen in the museum of the Zoological Society, presented by the Rev. R. T. Lowe, of Madeira, where it was captured. The following quotation from the 'History of British Fishes,' comprises a record of all that is known of this rare fish.—*Ed.*]

Note on the Boar-fish. A specimen of the Capros Aper of authors having been taken in Mount's Bay, in October, 1825, and a notice of the occurrence forwarded to the Zoological Society, with a drawing and description by Dr. Henry Boase, a figure and short account necessarily belong to a 'History of British Fishes.' Its right to rank among them is confirmed by the fact, that at the moment of preparing this account, by the united kindness of W. C. Trevelyan, Esq., of Nettlecombe, and Mr. William Baker, of Bridgewater, I have been favoured with a notice of the occurrence of a second example of this rare fish, which was obtained in Bridgewater fish-market on the 18th of April, 1833. A drawing of the fish, made while the specimen retained its natural colour, also accompanied the communication. Mr. Baker has since been kind enough to give me his specimen just referred to, and Mr. Harvey, of Teignmouth, has recently obtained an example of this rare fish on the Devonshire coast. The Capros, according to the ancient authorities, was known to Aristotle. It is figured and described by Rondeletius, and again by Willughby,† as quoted. It is said to have been called by several names that signify wild boar and marine boar, on account of its projecting nose and mouth, the form of the head, and its bristling spines.—*History of British Fishes, by William Yarrell*, i. 191. 2nd ed.

Note on the Preservation of Fishes. Mr. Kidd has transmitted a specimen of the streaked wrasse (*Labrus lineatus*), as an example of his mode of preserving fishes. We have placed it in the hands of our publisher, Mr. Van Voorst, who will be happy to show it to any of our readers. The great desiderata, preservation of form and colour, appear to be perfectly attained.—*Ed.*

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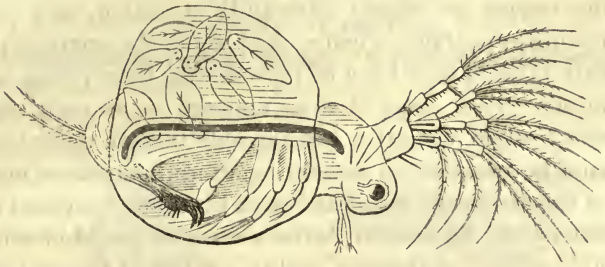
* British Fishes, i. 190, 2nd ed. † Willughby, p. 296, p. T. iv. fig. 4.

Notes on British Entomostraca. By W. Baird, Esq., M.D., &c. &c.



Daphnia brachiata.

The minute crustaceous insects which were arranged by Muller under the general name of Entomostraca, meaning insects inclosed within a shell, have met with very little attention from the naturalists of Great Britain. Their exceeding minuteness and extreme delicacy of structure, have perhaps been the causes of this neglect, deterring most naturalists from examining them and studying them as they require to be studied — fresh from their native habitats. The difficulty of preserving them obliges the naturalist to seek them in their secret lurking-places—the fresh-water ponds and ditches, and the little pools in the rocks on the sea-shore, where they are chiefly to be found, and to study them as it were on the spot, with the aid of his microscope. The celebrated Latreille, after some remarks upon this extremely interesting class of little creatures, observes, "The organs of mastication are almost to this day hid from the eyes of observers. How can we discover a part which does not constitute the tenth part of a microscopic animal? The eyes of De Geer and Jurine however have believed that they could distinguish something. The latter has remarked, in the *Monocle puce* of Linnæus, two mandibles without teeth &c. These observations are so delicate, that out of a hundred entomologists, scarcely shall we find two or three who are able to repeat them, and participate, in some sort, in the pleasures of that discovery."* Since Latreille penned the above, our knowledge of the anatomical structure of these marvellously small creatures has been much extended, and the few naturalists who have had patience to repeat the observations alluded to in the above quotation, have, I am sure, fully participated in the pleasures enjoyed by the first discover-

* 'Hist. Gen. et Part. des Crustac. et Insect.' iv. 199.

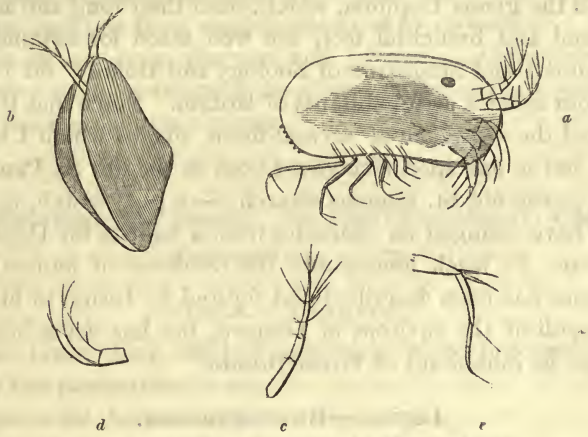
ers. The organs of mastication are not however the only organs that are worthy of being noticed. The beautiful and delicate structure of their feet and branchial appendages are worthy of all admiration. These latter organs are almost constantly in motion, and present a most interesting appearance when viewed under the microscope. The extraordinary method they have of reproducing their young, with the transformations which some of them undergo in an early stage, are subjects which might occupy a considerable time in describing, and which cannot be attended to without exciting the greatest interest in the mind of the observer. A full and most interesting account of these curious matters may be seen in Jurine's work on the Monoculi found in the neighbourhood of Geneva, and in a series of papers published in the 'Magazine of Zoology and Botany' for 1836-7.

The least known of all the genera of this interesting order of creatures is the genus Cythere. It was established by Muller, in his 'Zoolog. Dan. Prod.' in 1776, and several species were afterwards described by him in his 'Entomostraca,' in 1781. The whole of these were marine, and no other author, after Muller, seems to have taken any notice of them, either with regard to their anatomical structure, or extending the number of species. Nestling in the quiet secluded little pools in the rocks on the sea-shore, amongst the little corallines and sea-weeds which make their abode there, they were very likely to escape the notice of most naturalists; and accordingly, as far as I know, no new recent marine species had been described since Muller's time, till I described several in the 'Transactions of the Berwickshire Naturalists' Club' for 1835; and afterwards in the 'Magazine of Zoology and Botany,' in 1836: where also I have described all that is yet known of the anatomical structure of these curious little creatures.

In 1817, Say, in a paper published by him in the 'Journal of the Academy of Natural Sciences of Philadelphia,' on the Crustacea of the United States, recorded a species as found in fresh water in Georgia and East Florida, and we believe that till now it was the only recent *fresh-water* species that had been discovered. In the 'Transactions of the Geological Society,' v. 136, Mr. Sowerby describes a fossil species from Hampstead; but there is so little difference in the shell between this genus and Cypris, that it appears to me very difficult to be able to refer a fossil species to the genus. In the autumn of 1841 I discovered the species here described, in a pond of fresh water near Hanwell, in Middlesex, being the second fresh-water species yet recorded.

In Milne Edwards's arrangement the insect here described belongs to the —

Order.—Ostracoda.
Family.—Cyproidæ.
Genus.—Cythere, *Muller*; Cytherina, *Lamarck*.



a, *Cythere inopinata*, magnified. *b*, Animal lying on its back. *c*, Antenna. *d*, First pair of feet. *e*, Last pair of feet.

Cythere inopinata. The shell is oblong-ovate, nearly of equal size at each extremity; white, with a slightly orange-coloured mark on the upper edge; transparent, smooth and shining, perfectly free from hairs, but possessing a few short spinous projections on the lower margin of the posterior extremity. Each valve has a gibbous projection about the middle, which is best seen when the animal is lying upon its back (fig. *b*), and is situated on the anterior margin. The antennæ (fig. *c*) are composed of five articulations, and are furnished with several shortish setæ. The anterior pair of feet (fig *d*, the pediform antennæ of M. Edwards), are provided with the stout jointed setæ which I have shown all the species of this genus to be possessed of, ('Mag. Zool. and Bot.' i.) The posterior legs (fig. *e*) are as in all the other species, each pair longer than the preceding one, the last pair being very long and slender. This species is very minute in size, and from this circumstance, and from its always creeping at the bottom, is easily overlooked.

Inhabits a pond between Hanwell and Southall, Middlesex.

The peculiar habit of the animals of this genus is to walk or creep amongst the plants, corallines &c. amongst which they live. I have

never seen them swim about as the animals of the genus Cypris do, but when shaken out of their lurking-places into a tumbler of water, they descend in gyrations until they reach the bottom, and then they creep along the surface of the vessel till they reach any vegetable matter they can find; upon this they creep along searching for food. In this habit they differ very widely from the beautiful little insects belonging to the genus Daphnia, which, from their long and mostly feathered rami and branchial feet, are well fitted for swimming about. In the 'Annals and Magazine of Zoology and Botany' for 1837, I described four species as inhabitants of Britain. Since that time I have ascertained the existence of several more, one of which I have never met with but in one spot, a stagnant pool in the old St. Pancras road, nearly opposite old St. Pancras church;—a pool which, in a year or two, will have changed its character from a habitat for Daphniæ, to a resting-place for brick houses and the residence of human beings.—This species has been described and figured by Jurine in his work on the Monoculi of the environs of Geneva, but has never been noticed till now as an inhabitant of Great Britain.

Legion.—Branchiopodes.
Order.—Daphnoides or Cladoceres.
Family.—Daphnidiens, *Milne Edwards.*
Genus.—Daphnia, *Muller.*

*Daphnia brachiata.** The length of this little creature is about half a line. The shell is of an olive colour, transparent, showing the stomach &c. very distinctly. It bulges out very much posteriorly, giving the insect a very *jolly* appearance, and is ciliated anteriorly. The main stalk of the rami is very large and fleshy looking; the under edge, for about half its length from the base, being crenated, and having two short setæ springing from one of the crenations or small lobes at about the middle of its length; the upper edge is serrated. The anterior branch of the rami has four articulations, the first one very short. On the inner edge a rudimentary seta springs from it, and another from the outer edge of the second articulation. One long seta springs from the third, and three long setæ from the last articula-

* Syn. Monoculus brachiatus, *Jurine.* Daphnia brachiata, *Desmarest, Edwards.* Desmarest, followed by M. Edwards, quotes the D. macrocopus of Straus as a synonyme of this species; but the form of our insect and that of Jurine's are so different from that given by Straus, in his paper in the 'Mem. du Mus. d'Hist. Nat.' v. t. 29, f. 30, that I hesitate in pronouncing them identical. Jurine's figure is very good, but in the specimens I have examined the head is a little more erect. (See fig. at p. 193).

tion. The posterior branch has three articulations, sending off one long seta from the first and second, and three from the last; these articulations are somewhat serrated on the edges, and the long setæ are all finely plumose and jointed about the middle of their length. The antennæ are very large and long, projecting straight out from the beak, and terminated by several short setæ. The tail terminates in a sort of articulation at the extremity, which has eight short spines on its under edge, and two long stoutish claws at its extremity. The two setæ on the tail are long, plumose and jointed. This species is not so very active as some others of the genus, owing perhaps partly to its form. It has a great many young. W. Baird.

Notes on Lepidopterous Insects. By Edw. Doubleday, Esq., F.L.S.

(Continued from p. 112).

Genus.—Thymara.

Antennæ rather long, clothed exteriorly with appressed setæ, bipectinate, the pectinations long, and fringed with delicate setæ. Palpi (?). Eyes large, prominent. Anterior wings trigonate; costal nervure straight, attaining the costa considerably beyond the middle; subcostal nearly parallel with the costal nervure, bent downwards beyond the middle, so as partly to close the discoidal cell, from which portion two nervules are thrown off to the outer margin, whilst the third proceeds in a direct course to the costa just before the apex; median nervure four-branched, the nervules attaining the outer margin at about equal distances: discoidal cell divided longitudinally by a false nervure, which bifurcates at its extremity, one fork striking the disco-cellular curve of the sub-costal, the other the median nervure above and beyond the point where the second nervule from the base is thrown off, thus closing the discoidal cell: radial nervure

Thymara Zaida.

replaced by a very faint false nervure. Posterior wings sub-trigonate, tailed, anal angle produced into a tooth; costal nervure wanting; sub-costal slightly curving outwards, terminating in the tail, emitting one nervule to the anterior margin, just before the outer angle, another to the outer margin a little before the tail; median nervure slightly curved, terminating in the tail, emitting a nervule to the anal angle; between these two nervures is a false nervure or fold, which runs directly along the middle of the wing from the base to the tail, where it appears to unite with the median nervure. Tibiæ (apparently) all simple. Abdomen short, clothed with long hair.

Th. Zaida. Anterior wings diaphanous, nervures, costæ, outer margin and cilia fuscous, disk and inner margin orange: posterior wings orange, with a large black spot at the anal and outer angles: tails black, tipped with white: cilia of the wings orange, of the tail black nearly to the apex: head, thorax, feet and abdomen orange: antennæ black.

Inhabits Northern India. In the collection of the British Museum.

This beautiful insect is nearly allied to Himantopterus fuscinervis, *Wesmael*, of which a wood-cut is here given. The neuration of the wings is very peculiar, especially that of the posterior; and I am by no means certain that in these I have given the right names to the nervures. The mouth, unfortunately, I cannot examine, both the specimens having been touched underneath with some substance, which entirely prelcudes any attempt at such examination. Its station in the system cannot be very far from the Lithosiidæ.

Himantopterus fuscinervis.

London, May, 1843. E. Doubleday.

Note on the capture of Odacantha melanura. One hundred and nineteen specimens of this beautiful insect were a few days ago brought to me alive from the fens, where, in certain localities, they appear to abound. The end of April or the beginning of May seems to be the finest season for collecting them, and the following method, if adopted, is almost certain of being attended with success. Burwell fen, and the marshes in the neighbourhood of Whittlesea mere, are by far the most prolific localities in the county, where this species frequents the large heaps of sedge, so well known to everybody who is acquainted with the like districts. If a large cloth be taken, and these heaps well shaken over it, each bundle separately, insects innumerable, of all descriptions, besides Odacantha melanura, may be taken. It would be useless to enu-

merate the captures that I have thus made; I will therefore only add that they were chiefly in Curculionidæ, and include specimens of Notaris Scirpi, Sphærula Lythri, and great numbers of different species of Dorytomus.—*Vernon Wollaston; Jesus College, Cambridge, May* 1, 1843.

Note on the occurrence of rare Insects at Teignmouth.

Œdemera Podagrariæ	Xylina semibrunnea	Blatta Panzeri
viridissima	Rhizolitha adusta	Agrotis valligera
Elater cupreus	Miselia conspersa	Agrion elegans
Clytus mysticus	Ennomos lunaria	Lucanus Cervus
Pterostoma palpina	Eupithecia nanata	Oiceoptoma rugosa
Agrotis radia	venosata	Apoderus Avellanæ
Caradrina neglecta	Chrysis bidentata	Leptura 4-fasciata
bilinea	Nemoura pallida	Pachyta 8-maculata
Orthosia lunosa	Anomala Frischii	Libellula 4-maculata
Glæa spadicea	Otiorhynchus ater	Agrion rubellum
satellitia	Cneorhinus exaratus	Ornithomyia viridis

—*W. R. Hall Jordan; Teignmouth, May* 1, 1843.

Note on the seasons of appearance of Polyommatus Argiolus. Like the Argiolus of the Rev. W. T. Bree, in Warwickshire, ours too only appears about the latter end of April, affording an instance of a singular difference in habits from the same species in the South of England. It would seem probable that there was some error, or confusion of names and seasons concerning this butterfly, were not the fact supported by the most respectable testimony. At any rate, it requires more than a passing notice, for it must be the influence of powerful local circumstances, rather than that of climate, which causes so obvious a variation in the appearance of this insect. The history of our commoner native butterflies should not, in any one point, be suffered to remain in obscurity. In reference to this subject I may mention that Melitæa Euphrosyne and Selene only appear with us *once* in the season, the former in the middle of May, the latter towards the end of the same month. Artemis occurred last year in the beginning of June, and the three species were seen together, for a short time, flitting over the same meads. Again, Vanessa C-album occurs with us rarely in June and September, but is always common in two or three localities in early spring; the specimens then being so freshly coloured as to encourage a scepticism of the commonly received opinion of their hybernation in the state of maturity. On the other hand, Vanessa Polychloros we see perfectly plumed in August, dull in September and the succeeding March, and ragged in April.—*Henry Walter Bates; Leicester, May* 8, 1843.

Note on the capture of Stauropus Fagi. On the evening of the 7th instant I found a male on the inside of a gas lamp on Clapham-common. I was not a little surprised and pleased to take a veritable "lobster"—the *ne plus ultra* of the old collectors, and the cause of many a wishful walk to Birch Wood, within five miles of London bridge. —*J. W. Douglas;* 6, *Grenville Terrace, Coburg Road, Kent Road, May* 9, 1843.

Note on the capture of Stauropus Fagi. A fine female has just been captured at Mr. Low's nursery, Upper Clapton. It was taken in one of the out-buildings, wherein was a quantity of moss lately brought from a wood near Hertford; in all probability therefore it had been brought thither in the pupa state with the moss. It is now in the collection of Mr. H. Low, jun.—*Edward Doubleday; Brit. Mus. May* 10, 1843.

Note on the capture of the Emperor moth, by means of a captive female. A few of my friends having expressed a desire to see the capture of the male of this beautiful

insect by means of an unimpregnated female, we proceeded to White-moss on the 30th of April last, and after a little time succeeded in finding a female, but it did not attract the males until near the close of their flight at 5, P.M.; still we had sufficient sport to induce us to try again the next afternoon with the same female, and I can assure you we were quite satisfied, although a strong easterly wind blew all the time. The males came in abundance, and alighting on or about the box, allowed themselves to be picked off with the fingers, without attempting to escape. By lying down on the moss and looking over the heath, we could perceive the males beating up towards us at a distance of a hundred and fifty yards. Having gratified ourselves, we left for home, and passing through "Boggart-hole clough," a wild and romantic valley celebrated in Roby's 'Traditions of Lancashire,' we stopped some time to see an oak felled, and during the interval I was astonished to see an emperor fly with great swiftness *between two trees I had passed under*, and immediately afterwards alight on the box, covered with gauze and containing the female, which I had carried in my hand all the way from the moss to that place, a distance of not less than a mile and a half, by far the greatest distance I ever heard of a male tracking a female. Some entomologists may think this male had been bred in the clough, but I am not aware of a single specimen, with the above exception, having ever been found away from the moss, where they are very local. We captured Lasiocampa Rubi and Quercûs in the same manner on the moss; the former insect will come till it is quite dark, and both species fly with greater rapidity than Saturnia Pavonia-minor. — *Robert S. Edleston; Fearne Acre, Cheetham Hill, Manchester, May* 10, 1843.

Note on the Habits of Dytiscus punctulatus. I have several times kept specimens of Dytiscus punctulatus in confinement, both singly and in pairs, but never succeeded in preserving them more than a few months; whereas Esper is said to have kept D. marginalis alive three years and a half — an extraordinary longevity, which Stephens attributes, with great probability, to its celibacy. When I kept a pair together, I always found that the male died first; and his dead body had generally been mutilated and pretty nearly devoured by his widow. The females were at all times much more voracious than the males. I generally fed them with raw beef, of which they sucked the juices; but in summer I sometimes supplied them with small aquatic insects, which they seized with their fore feet, and tore to pieces with their mandibles, rejecting the elytra and other hard parts. I also fed them on earth-worms, and once introduced into the bottle a small frog, about an inch and a half long; on my return a few hours after, the frog had been despatched and partly devoured, and this by a single specimen. The larva of this and other large Dytisci is even more voracious than the imago. I have seen them devouring horse-leeches; and in the Anatomy-school at Oxford is one preserved in spirits, along with a small fry of a pike, longer than itself, which it had killed, and was devouring when taken by Professor Kidd. The appearance of the insect, when seen through the medium of the water, is extremely interesting, from the rich olive-green of the elytra (which is much heightened in this situation), the yellow labrum and margins of the thorax and elytra, and the silvery brilliance of the eyes, which appear as if invested with a globule of air. They speedily become familiarized to a certain extent, and will follow the finger round the glass, in expectation of food.—*Fredk. Holme; C. C. C. Oxford, May* 15, 1843.

Note on the capture of Claviger foveolatus. Mr. Ingall took a specimen of this very rare little beetle on the 29th of April last, in a stony field at the back of Box Hill; and on the 1st of May I captured a specimen in the same situation. Both were taken in th

nests of Formica flava, under flints; and the specimen which I took was seized, immediately on my turning over the flint, by an ant, who was rapidly carrying it off in her jaws when I captured it.—*Edwd. Doubleday; British Museum, May* 30, 1843.

Note on Mancipium Daplidice. In a former No. (Zool. 113) I stated that Mr. Le Plastrier had in his possession last winter four specimens of Mancipium Daplidice, in the chrysalis state, which he had reared from eggs laid by a female after it had been captured by him near Dover; and I then ventured an opinion that the flies would come forth in May. In this respect my expectations have been realized. In a letter from Mr. Le Plastrier, bearing date May 18, 1843, he says—"I have the pleasure of fulfilling my promise, by informing you of the safe arrival of my four specimens of Mancipium Daplidice last week, and certainly they are a splendid-looking insect, and of course, in fine condition; there are three females and one male." The above notice may not, perhaps, be wholly without interest to your entomological readers, as it serves to point out with precision the period when this rare insect makes its first appearance on the wing. I may add that Mr. Le Plastrier states in his letter that he has the specimens to dispose of. I suspect he is the only English entomologist who has *bred* a native Daplidice.—*W. T. Bree; Allesley Rectory, near Coventry, May* 31, 1843.

Note on the capture of Noctuæ with Sugar, in the Autumn of 1842, *at Epping.*

Calocampa vetusta. I captured thirteen specimens of this fine species between the 8th of September and the 4th of October.

Calocampa exoleta. I saw the first specimen of this moth on the 6th of October, and during the remainder of the month and the beginning of November I took about thirty specimens.

Agrotis Saucia. I captured two females of this species the latter end of October.

Agrotis suffusa. The first specimens were seen on the 15th of August, and from that time to the end of October there was a constant succession of fine specimens: they were very abundant.

Glæa satellitia and *Vaccinii* were first seen on September 15, and *G. subnigra* on October 3: all abundant.

Graphiphora C-nigrum appeared on August 16, and was very abundant.

Orthosia litura, pistacina, rufina and *ferruginea* were also very common.

—*Henry Doubleday; Epping, May* 31, 1843.

Note on the capture of Lophopteryx Carmelita, at Epping. I procured a fine pair of this species early in May, in Ongar-park woods; they were both sitting upon the trunks of birch-trees. The female laid a few eggs, from which I have obtained about a dozen caterpillars, which are now about two weeks old.—*Id.*

Note on the occurrence of Ceratopacha Octogesima at Epping. Soon after I sent to you on Friday, I was surprised to see in one of my breeding cages a beautiful pair of Ceratopacha Octogesima, an insect I never before saw alive, and did not possess a specimen of. Where I got the caterpillars from I do not at all know.—*Id.*

Note on Snails devouring Insects. In sweeping the long grass near Penzance, in July, 1836, numbers of middle-sized snails came into the net, most of them having in their mouth a Coccinella or some other small insect, which they were swallowing by degrees. From repeated observations I am confident this was not an accidental circumstance, but that the snails were actually devouring the insects; and as I never saw any notice of such a propensity, I mention it in the hope that my doing so may lead to some explanation.—*Fredk. Holme; C. C. C. Oxford, May* 31, 1843.

On the Animals which force other living Animals to form a House for their protection. By JOHN EDWARD GRAY, Esq., F.R.S., &c.

WE are all aware that the Bernhard crab often takes possession of an empty shell;* also that certain worms, as the Sipunculus, fix themselves in other shells, as the pelican's foot (*Aporrhaias Pes-pelicani*), or in a Dentalium, and by collecting together a little earth at the entrance, construct for themselves a good habitation; and that a species of annelide often takes possession of the tube of Vermetus cancellatus, and contracts the mouth of the shell so as to form a regular dome, leaving only a small hole the size of the parasite.† Some have believed that the parasite induces the Vermetus to do this for it, at the same time causing its own death; and from the similarity of the structure of the shell, of the dome, and that of the tube, there appears to be some ground for this idea, but the fact wants patient examination and verification.

It has not been so generally observed that some Crustacea, Cirripedes, Mollusca and Vermes take advantage of the manner in which corals, sponges, and other radiating animals grow, and the ease with which they are induced to turn out of their usual course, to fix themselves on their surface, so as to cause the animals of these kinds on which they have affixed themselves, to form a chamber for their protection. Indeed, this may be also said to be the case, although done by exactly the contrary process, with some vertebrated animals, as for example the larger Cirripedes, as Coronula diadema, Tubicinella Balænarum, &c. which affix themselves to the skin of the different species of whales, manatees &c., and then, by the gradual addition of new shelly matter to the lower surface of the valves of their shell, gradually sink themselves as they grow into the thick skin of these animals, until the skin entirely protects them; the result being similar to the attack of the Guinea-worm and other parasites, although these animals first enter by a pierced wound, while the barnacles above referred to only enter by causing the absorption of the surface by pressure.

The parasitic Cirripedes are so abundant on corals, that they have been noticed by many authors, who have written or figured these productions, yet they have not been generally understood. Linnæus

* Whether or not he previously devours its natural inhabitant is foreign to the purpose of this communication.

† Gray's 'Etchings of Mollusca,' t. 58, f. 3, the right hand figure is the parasitic worm, and the two left hand figures are the proper animal of the shell.

believed them to be part of the coral itself, and called a specimen of Astræa which was full of them, Madrepora polygama (Amœn. Acad. iv. 250, t. 3, f. 15), denying at the same time that they could be Lepades! because of the absence of the valves, the small size of the holes, and the surface of the cavity being rayed. Savigny, in the large work on Egypt, appears to have properly understood their structure: since his time the various kinds have been minutely examined, and placed in different genera. Those inhabiting stony corals form a tubular sheath or *base*, as it is called, which is elongated at the top by the secretion and deposition of fresh shelly matter on the edge of the tube, as the coral grows: those that live in sponges form hemispherical bases, which are enlarged in the same manner: and those which fix themselves in the stems of Gorgoniæ form a slipper-shaped base, to enable them to clasp the thin stem, and at the same time maintain a sufficiently erect position to allow the animal freely to collect its food.

In the instances cited the coral has followed its usual course, and the animals have only taken up their abode in its substance; but Spengler long ago described a coral under the name of Madrepora cochlea, which appears to be a Cyathophylla, whose form has been modified by some worm taking up its abode in its base, and forming within the lower side of the coral a cylindrical spiral cavity. The base of the coral is slipper-shaped, with a large round hole communicating with the tubular cavity near the projecting part of the slipper. The star is more or less irregular, formed of many unequal rays, with a compressed perforated centre; besides this hole there is a series of minute pores on the upper surface of the margin, and often some others in the centre of the base, which appear to communicate with the tubular cavity. I have lately received from China, with the specimens above described, another species, agreeing with the former in most particulars, but differing from it in the coral being more solid and hard, and the whole of its surface being covered with continued longitudinal ridges, with finely crenulated edges, extending from the edge of the star to a little within the margin of the flat base. The star is formed of more lamina, which have a number of shorter columnar processes placed between them, especially near the central depression. The large hole enters obliquely, and is furnished with a regular shelly sheath (not found in the other species), and the holes communicating with the tube are only to be observed on the hinder half of the erect sides of the coral, and not at all on the base. I would propose to call this Cyathophylla Spengleri, in honour of N. Lorenzo Spengler, the excellent Danish conchologist who first described the

former species. From a small specimen which came with the others, this coral, in the young state, has a narrow base formed on a straight tube.

I have not seen either of these kinds of coral shaped like other Cyathophyllæ, with a conical tapering stem, yet from the shape of the star they are evidently allied to that genus, so that perhaps they may belong to the next class of instances, in which the coral or coralloid body is evidently modified by the parasitic animals which form a chamber in its substance, yet take a peculiar form, and appear never to be found except in conjunction with the parasite.

A very common instance of this kind is often to be observed on our own coast. Many of the shells taken possession of by the common hermit crab, are covered with a species of Alcyonium, described by Dr. Johnston of Berwick under the name of Alcyonium echinatum. This Alcyonium gradually enlarges, and being moulded on the body of the hermit crab, forms for that animal a house, adapted to its growth, so that it has no necessity either to enlarge its house by the absorption of part of the cavity of the shell which it inhabits, or by leaving the shell and seeking for another better adapted to its size, as other specimens are obliged to do which have not the assistance of the coral. One can understand that the crab may have the instinct to search for shells on which the coral has begun to grow; but this will scarcely explain why we never find the coral except on shells in which hermit crabs have taken up their residence.

The "calthrops shell," as it has been called (Turbo madreporoides, Burrows' 'Elements of Conchology,' t. 27, f. 1), is a shell inhabited by a Pagurus, which is covered by a peculiar species of cellepore. Another shell, similarly covered with another species of cellepore, is figured by Lister, (Conch. t. 585, lower right hand figure). Both the Cellepora Calthrops and C. Listeri above cited, are peculiar for having the mass of the coral marked with large green spots: and I have several other examples of the same kind from different parts of the world, two species of shells from the Chinese seas, covered with an Alcyonium, each with branching arms, the arms of the two specimens taking different and definite directions. Another, which appears to be very common on the west coast of Africa, is covered with a Lobularia? with large polypes, all the specimens having four large thick claw-like branches, bending down towards the mouth of the cavity which is inhabited by the Pagurus.

The Mollusca and Annelides which live in coral, equally cause the coral animals to protect them; some, as the Modiolæ, being sunk into

the surface, like the Cirripedes; and others, as the Magillus and Serpulæ, being attached to the surface, and lengthening their tube as the frondose expansions of the coral to which they are attached enlarge, so that they may be able to procure their fair share of nutriment, and not be starved, as they would be if the animal of the coral overtopped them.

These cases are common enough, but I have a specimen from the Rev. Mr. Guilding's collection which shows a much more uncommon instance. It is an expanded coral, which forms a thin surface on the top of another coral, and is furnished with a number of small, depressed, horizontal cases, opening with an oblong mouth. Some of these contain within them a small, free, crustaceous animal, a Cymothoa, which nearly fits the case; and it is evident, that by their moving backwards and forwards on the surface, they have caused the animal of the coral to form one of these cases for the protection of each specimen.

The animals which form their habitation in corals, appear to begin their domicile in the same way as the barnacles before referred to: they take advantage of the soft and yielding nature of the animals which form the corals &c., and taking up a lodgment in their body, all they have to do is to keep a clear passage in it, either by the moving backwards and forwards, the exertion of their limbs, or the ingress and egress of water to and from their bodies, and in time, as the coral is secreted by the animal, it will form a wall round them; but if, by any accident, the parasitic animal should not keep its passage from the coral to the surface of the body of the animal clear, which it must be constantly induced to do, since by this means it procures its food, the coral animal will in a very short time close over it and bury it alive in the mass of the coral; and this, from the number of these animals, of all sizes and in different stages of growth, which are to be found in the substance of the large and massive corals, must often be occurring. Thus the Italian romance is often literally fulfilled in Nature.

J. E. Gray.

Notes on the vitality of the sheath of the Hydroidæ.

By R. Q. Couch, Esq., M.R.C.S.L.

An opinion is entertained by some naturalists that the polypidoms or solid parts of most zoophytes are extravascular and inorganic, and consequently, when once formed, are for ever placed beyond the

power of any vital action, and are liable to no alteration but what may be produced by a chemical or mechanical change in their ultimate particles. Thus, in the Hydroidæ, the central and living pulp is enclosed in an exuded and dead sheath; and, in the Asteroidæ, an inorganic axis is enclosed in the centre of the living mass.

The solid or horny part of the Hydroidæ is sometimes said to be formed by an exudation from the surface of the granular pulp, and at others, by the pulp distending the horny cuticle of the gemmule, and extending it into all the ramifications and branches that this beautiful order assumes. That the sheath depends for its existence on the pulp, or that it is intimately connected with it in a physiological relation, is evident, for they are simultaneous in their growth; in proportion to the growth of the pulp is the extension of the sheath, always bearing a relative proportion to each other. Thus they may be said to be mutually dependant, and together to form the perfect animal. But whether the sheath be a dead and an inorganic exudation will be best seen by an examination of its mode of formation, with the production of the cells, ovarian vesicles, and other circumstances connected with them.

a, *b*, *c*, *d*, *e*, Different stages in the development of the polype. *f*, The infundibuliform opening in a young cell of the Knotted Sea-thread. *g*, Sections of new and old parts of the sheath of *Sertularia Abietina*.

The mode of growth of the branches, and formation of the cells and vesicles, is nearly alike in all, being but very slightly modified in the different species, so that an examination of one may suffice for the whole order. That common species, Sertularia pumila, may be

taken as an example. After the gemmule has become fixed and rooted, it becomes elongated superiorly, to the length of an internode, in a bulbous manner. One, and frequently several, of the lower internodes are destitute of cells; in such cases the pulp undergoes no further change. Superiorly, where the cells are formed in pairs, the elongation of the pulp takes place in the same manner, but is much larger and more bulbous, being of the length and thickness of the two cells. At this time it appears as a diffuse, semi-opaque, granular mass, without any distinction of parts. The first change observed is three darkish spots at the base, at equal distances, in a transverse line, answering to the two cells and the continuation of the stem. At first these spots have no defined edges, but are softened off into the surrounding pulp. As they become larger, they become deeper in tint, more defined, and assume the general form of the polype; the external surface of the pulp also becoming more and more translucent as development goes on. At first the sheath is nowhere apparent, but as the edges of the pulp become pale and translucent it becomes drawn from the sheath, and frequently into horizontal folds, as if from a force acting towards the centre. Condensation or organization thus proceeds from below upwards, and from the centre towards the circumference. After the pulp has become separated from the sheath its upper surface becomes serrated, and afterwards organized into the tentacula. The polype thus formed is drawn towards the centre of the cell, which remains closed, so that the polype is entirely included from the water. The upper portion of the cell, which eventually becomes the mouth, gets more and more attenuated, and finally ruptures; the ruptured edges fall in, and give the cell a funnel-shaped opening. If the bursting of the cell depended on pressure from within, it must be from the polype; but as the part, before it opens, does not bulge much, so when it ruptures, the edges, instead of being forced out, fall in; exactly the reverse of what would be expected if the rupture depended on internal pressure. In addition to this, it will generally be found that the polype does not touch the upper part of the cell for some time before it ruptures, and hence can have but little or no mechanical effect in forming the aperture. Though all the cells open in this manner, yet in some the mouth is formed above, and in others by the side; but the specific differences are prominently formed after all communication between the cell and polype has ceased, and after the cell is ruptured, and hence are probably produced from a power within the sheath itself. In a transverse section of the stem of a horny zoophyte it is found to be annular, the centre of the ring being

the part formerly occupied by the pulp. In the section of a newly formed part, the space between the surfaces of the ring is of a very delicate and spongy character, of equal consistence throughout, and very flexible. In a similar section of older parts, the texture is firmer and more solid, and the inner half of the space more compact, and of a deeper colour than the external half. In the lowest portions the structure is very solid and unyielding, so that, in old specimens, it cannot be bent without the danger of breaking. In the Sertularia argentea the youngest parts are of a silvery whiteness, which in the older, changes to a brown colour. This change is not produced by incrustations on the external surface, or by the transudation of foreign matter from without, but by an organic change in the sheath itself; since it begins from the interior surface and proceeds to the exterior, and has regular gradations from the newest part, where it is nearly absent, to the older portions. In the pheasant's tail coralline (*Plumularia myriophyllum*), the polypidom is profusely marked with oval orifices, very similar in appearance to the *stomata* of flowering plants. This shows a structure very different, and far superior to what would be expected from a mere exudation from the pulp. In the spaces between the enlargement of the stem and the ingrafting of the internode, the surface is striated, as if traversed by vessels : but I have never detected any vascular appearance in this or any other species. It is very common to observe, in many species of Sertulariadæ, that the lower pinnæ are frequently absent, but leaving marks behind in proof of their once existing. This is most remarkably the case in Thuiaria thuja and Thu. articulata, but is observable in many others, as the Plumularia falcata, Plu. setacea, &c. : it is, no doubt, in a great measure produced by the violence of the waves, but not entirely so. In examining some specimens, when taken immediately from the water, the central pulp of the lower pinnæ and branches is frequently pale, and the polypes appear inactive and pale, as if diseased. If this is very much the case, a well-defined line of demarcation will be observed at that part of the branch which is inserted into the trunk; this line appears also on the horny sheath, and the branch is sloughed off, apparently in the same manner that trees shed their leaves. After the part has fallen, the truncated surface becomes contracted, the scar healed, and the exposed pulp shielded from contact with the water : this is no doubt greatly assisted by the action of the waves, though it does not seem the great cause of it : if it was caused entirely by the motion of the sea, those species which grow near the shores would be the most liable to it, from being more exposed. In

the Laomedeæ it is very common to find branches torn off, but the specimens show evident signs of great violence in the destruction of their cells, and other marks of depauperization. The Sertularia nigra, a remarkably stout and rigid species, which grows near the Eddystone in the English Channel, is remarkably exposed to strong and constantly changing currents, yet the shedding of the pinnæ is comparatively rare in it, and the ovarian vesicles are constantly produced in rich profusion. If the sheath were subject to no change after it was once formed, the younger pinnæ would suffer equally with the older ones, which is not the case. When either the pinnæ or vesicles disappear, they leave behind well-defined cicatrices, which gradually become nearly obliterated, and not jagged and irregular marks, as if produced by violence. They appear to fall, after having performed their functions, from a process very similar to that by which trees shed their leaves and fruits.

The sheath also, under certain conditions, affords signs of irritation which could not be expected from a dead membrane. In the Campanularia volubilis, in which the cells stand on long slender footstalks, which are annulated at each extremity and plain in the centre, the whole length of the peduncle will become corrugated, as if ringed throughout. Ellis figures them in this condition at pl. 14, fig. A, in his Essay on Corallines; and I have seen them assume this appearance, and again change it, while under the microscope: in either state, and while the change was going on, the polype appeared to be very little influenced by it, or to have any effect in producing it. The extremities of the branches and trunk are always more tender than other parts, from being more recently formed: these points frequently give way, and the pulp is forced through the ruptured parts. This extravasation is sometimes so extensive that in the knotted sea-thread (*Laomedea geniculata*), sea-bristles (*Plumularia setacea*), &c., scarcely a vestige of the pulp remains. This effect can be produced by immersion in fresh water, by allowing the animal to remain in deteriorated water, or by the warming of the water by the manipulation used in examination. In what way can this be produced but by the pressure of the horny envelope on the pulp? This, together with the corrugation of the stalks of the cells in Campanularia volubilis, shows a degree of irritability in the sheath entirely incompatible with an inorganic and extravascular nature. The two parts are intimately connected, governed in their growth by one principle, which not only regulates their formation, but appears to be the source of the specific differences. The polypes are but of secondary importance, and ex-

ercise no influence on the growth or development of the mass, except so far as they are the points through which nutrition is taken in. To separate therefore these parts by so great a physiological separation as *life* and *death*, is to do violence to Nature. One plan of life governs both, as well in their specific formations as in their mere growth. Many species assume some varieties of general form, depending on the localities in which they grow. The Plumularia cristata, for instance, in favourable situations will trail along on sea-weed, and send forth elegant plumes from one to four inches in length; but near the shore, in less favoured spots, they scarcely reach a quarter of an inch in length, and are exceedingly pale and slight; sometimes they rise from stones in a single plume, and at others have an irregular and branched appearance; but, in all, the cells and ovarian vesicles retain their specific differences: but as the polypes and the granular pulp are not in actual contact with these parts at the time in which the specific differences are formed, in what way are these differences so unerringly formed, unless by a power in the sheath itself? The whole of the observations I have been able to make on these creatures can be best explained by supposing a vital relationship existing between the pulp and sheath, and the irritability of the latter can hardly be explained in any other way. It is not more difficult to conceive the vitality of the sheath of the Sertulariadæ than of the teeth of animals. Teeth were almost always considered to be endowed with vitality, yet, till the late researches of Nasmyth and Owen, we had no decided proofs of it: their structure alone is now a sufficient proof, but this is still further strengthened by their capability of being injected. But though the polypidoms of the Hydroidæ have not been injected, nor in them have been detected traces of vascularity or a cellular structure, yet the circumstances under which they exhibit irritability are proofs sufficient to indicate a vital character. That the sheath is not a mere distension of the cuticle of the gemmule every one will allow, since its thickness is nearly alike in all parts, and the growth of the whole is sometimes so rapid that simple expansion would produce a rupture.

The opinion of Dr. Roget that "polypi are for the most part attached to some inorganic shell or base, which may be either of a horny or calcareous nature," seems therefore to be erroneous: 1st. From the manner in which the growth of the whole, and formation of the cells take place. 2ndly. From the internal alteration of the structure of the sheath, through age. 3rdly. From the shedding of the ovarian vesicles and branches. 4thly. From the irritability of the

sheath. And 5thly. From the peculiar formation of the trunk of the Plumularia myriophyllum. R. Q. Couch.

Polperro, April 24, 1843.

Anecdote of a Combat betwixt two Hares.

By Charles Waterton, Esq.

"At last the two stout *hares* did meet
Like *quarry* of great might,
Like lions moved, they laid on load,
And made a cruel fight."—*Chevy Chase.*

On Easter Sunday, in the afternoon, as I was proceeding with my brother-in-law, Mr. Carr, to look at a wild-duck's nest in an adjacent wood, we saw two hares fighting with inconceivable fury on the open ground, about a hundred and fifty yards distant from us. They stood on their hinder legs like two bull-dogs resolutely bent on destruction.

Having watched them for about a quarter of an hour, we then entered the wood;—I observing to Mr. Carr that we should find them engaged on our return.

We staid in the wood some ten minutes, and on leaving it, we saw the hares still in desperate battle. They had moved along the hill-side, and the grass was strongly marked with their down for a space of twenty yards.

At last, one of the sylvan warriors fell on its side, and never got upon its legs again. Its antagonist then retreated for a yard or so,—stood still for a minute, as if in contemplation, and then rushed vengefully on the fallen foe. This retreat and advance was performed many times;—the conqueror striking its prostrate adversary with its fore feet, and clearing off great quantities of down with them.

In the mean time, the vanquished hare rolled over and over again, but could not recover the use of its legs, although it made several attempts to do so. Its movements put you in mind of a drunken man trying to get up from the floor, after a hard night in the ale-house.

It now lay still on the ground, effectually subdued; whilst the other continued its attacks upon it, with the fury of a little demon. Seeing that the fight was over, we approached the scene of action,—the conqueror hare retiring as we drew near.

I took up the fallen combatant just as it was breathing its last. Both its sides had been completely bared of fur, and large patches of down had been torn from its back and belly. It was a well-condi-

tioned buck hare, weighing, I should suppose, some seven or eight pounds.

Mr. Carr's groom was standing by the stable door, as I came up with the hare in my hand. Here, John, said I, take this to your own house, and get your wife to dress it for your family; — it is none the worse for being killed on Easter Sunday: — and then I told him how it had come into my possession. He thanked me kindly for it; and I learnt from Mr. Carr at the end of the week, that John's wife had made it into a pie, with the addition of a few rashers of bacon; — that it proved to be uncommonly good; — and that they would all remember, for many years to come, the fight betwixt the two hares in the park at Walton Hall, on Easter Sunday afternoon, the 16th of April, 1843. CHARLES WATERTON.

Walton Hall, May, 1843.

Anecdotes of Bats flying by day-light. Thinking it possible that additional instances of bats flying by day-light (Zool. 7, 35, 87) may be acceptable to the readers of 'The Zoologist,' I beg to state that on Sunday, the 4th of December last, between 2 and 3 o'clock in the afternoon, I observed a bat flying about our garden, as briskly as if it had been a summer's evening. The day was sunshiny and cloudless, and so warm that I was sitting out of doors at the time. The other instance I have to mention occurred at the village of Langar, in Nottinghamshire, about 4 o'clock in the afternoon of the 6th of October, 1840. I was sitting sketching by the side of a pool of water, when I was visited by a bat, which flew repeatedly over the surface of the water, now and then dipping in its mouth, either to take a sip or catch an insect, I could not be certain which.—*Anna Worsley; Bristlington near Bristol, May*, 1843.

Note on the Piscivorous Habits of the Brown Rat. I have not the slightest doubt that the Rev. Mr. Banister was correct in his observation of the attack of an eel upon a rat (Zool. 108), nevertheless it is not always the case that the rat is the *preyed upon* in encounters with the finny inhabitants of our streams. In February last, as some rat-catchers were pursuing their calling in an old warehouse, whose foundation is washed by the waters of the Trent, near our town, they opened several burrows of the common brown rat (*Mus decumanus*), and found half-eaten remains of the river lampern (*Petromyzon fluviatilis*) quite fresh, and which had evidently been captured and drawn in by rats. About the same time a small potato-ground, close to the same warehouse, was turned over by the spade in course of cultivation, and a large hole was laid bare, in which were found upwards of *twenty* full-sized lamperns, some fresh and others very stale, but all partly eaten; — the head and region about the breathing holes being the parts preferred by the gluttonous occupants of the hole. I much wish we had on record a good observation relative to the mode in which the rat captures and secures so slippery and powerful a prey. It must be a most amusing sight to see the rat enveloped in the folds of the writhing lampern, rolling over and over at the bottom of the stream, until its powerful bite has reached a vital part. — *Edwin Brown; Burton-on-Trent, May*, 1843.

Note on the keen scent and persevering efforts of the Weasel tribe in pursuit of their prey. A relative of the present First Lord of the Treasury informs me, that a clergyman of the Church of England and himself were once out in the fields a few miles from Burton, in quest of feathered game, when they suddenly observed a hare, all bespattered with dirt, and evidently much distressed, to come through a gap in a fence close at hand, and cross the field. In a very short time two stoats (*Mustela erminea*) made their appearance at the same gap, in hot pursuit of the hare, but overran the scent. Nothing daunted by this reverse, they made a *cast* in fine style, regained the scent, and continued running on the track whilst in sight of my informant and his friend. Another gentleman, on whose veracity I can also implicitly rely, tells me that when a boy he was once hiding himself in a barn, waiting for "queests," when he saw a mouse run hastily across the floor, some little while after followed by a weasel (*Mustela vulgaris*) of particularly small dimensions (most probably a female), which carried its nose very low, as if smelling its way, and passing, without any deviation, along the track, entered the hole through which the mouse had previously gone. The poor little mouse thus pursued again made its appearance, and presently after the weasel also, upon the track, as before. This was repeated several times, and from the persevering efforts of the pursuer, there is little doubt that the mouse ultimately fell a victim to the keen scent and the rapacity of the weasel. A respectable mechanic also assures me that he was once witness to the fact of a stoat swimming across a brook about two yards wide, in pursuit of a rat which he had just before observed to swim across.—*Id.*

Note on the Noctule Bat (Vespertilio noctula). A remarkably fine male specimen of the noctule, measuring fully fifteen and a half inches in extent of wing, was found in the college garden on Easter-eve, with one wing broken. They are rarely seen here so early in the year, but towards the end of June and July they appear in considerable numbers, flying rather low over the streets (in contradiction to White of Selborne's epithet of *altivolans*), and exhibiting great powers of wing. Oxford, from its old buildings and numerous towers, is a complete nursery of bats; and I suspect the tower of Merton is a favourite haunt of this species, as some years since, when I occupied rooms opposite to it, they frequently, as well as other species, flew through the windows on summer evenings; but the rapidity and strength of their flight made it very difficult to catch them with a net. On these occasions, they would dash close to my face in a menacing manner, snapping their teeth loudly, instead of showing the terrified timidity of the smaller species. –*Fredk. Holme; C. C. C. Oxford, May* 15, 1843.

Note on the Habits of the Nuthatch. By the Rev. J. C. Atkinson.

When an inmate of the parsonage at Pakenham (Suffolk) I noticed the occasional visits of a pair of nuthatches (*Sitta europæa*) to an old mulberry-tree which stood about eight or ten feet from the dining-room window. In order to encourage them frequently to repeat their visits, I put some nuts in chinks in various parts of the tree. In the course of a few days these were discovered and carried off. By replacing them with fresh ones as soon as removed, the birds soon learnt to pay incessant attention to their new feeding-ground. Theywere

there the first thing in the morning, and apparently the last thing before going to roost. Seeing that the nuts were carried away whole, I began to crack them, and fix the kernel only in the crevices, or by means of pins, to the tree. The greater part of the nuts were now eaten on the spot; occasionally, when a large piece was got, the birds flew away with it to some tall trees close by, but very soon returned for more. Their absence on these occasions was very short, certainly not long enough to lead me to suppose they had time to eat the nut; I concluded it was either added to a store already existing, or deposited on the tall trees.

The nuts latterly were fixed to a sort of table of about eight inches diameter, formed by the loss of a limb of the tree which had been cut off. They were put on to the number of seven or eight at a time; but on no one occasion (and I watched them almost daily for two years) did I see the *pair* feeding at the same time. They were frequently — perhaps generally — both on the tree at the same time, but the female never ventured to help herself in the presence of the male; and if he returned while she was in the act of feeding, she immediately retired, leaving the banquet to his solitary enjoyment. If by chance she had not observed his return to the tree, he very unceremoniously drove her away: however, on two occasions in the breeding season, I have seen him feed her with much apparent tenderness. Sometimes in May they absented themselves altogether, and I saw nothing of them for a month: one date of such absence was May 9. Neither of them would permit the presence of another bird, and the accidental arrival of a titmouse or sparrow, was the signal for a very amusing chace from bough to bough and shrub to shrub; the intruder appearing to have a most wholesome fear of the nuthatch's formidable bill. Even the pugnaceous robin holds them in awe, and retires without contest.

I may here observe that the ox-eye (*Parus major*), the nun (*P. cæruleus*), and (rarely) the cole-titmouse (*P. ater*), were as fond of the nuts as the nuthatch, and worked at them with much assiduity during his absence; yet though there were three or more tits feeding at once, they did not cause much loss to the proper guests, as the pieces they abstracted were very minute; on the contrary, two or three blows of the nuthatch's bill frequently divided the nut into halves, one of which was carried off on the instant, and the other also, if both birds were on the tree.

Fragments of nut were sometimes driven from four to six feet from the tree by the violence of the blows applied: they were almost invariably caught by the bird before they reached the ground, and, with-

out one single exception, in the bill. The feet were never used for that purpose.

Latterly these birds became so tame as to sit within two feet or so of my head, while I was preparing their feast; and if I threw a nut into the air to them, they would fly after and catch it. They took dozens in this way. It is worthy of notice that I never saw more than two of these birds on the tree or in the garden, although they were by no means uncommon in the neighbourhood; their young even were never admitted. Could there be any connexion between their annual absence in May and the non-appearance of their young?

Their position when feeding was a matter of perfect indifference: one while they would be head downwards, then in a horizontal position, (the table above mentioned being nearly perpendicular); then with their heads uppermost.

The yew-berry affords them a food to which they seem to be partial. They extract the hard stone or kernel with great neatness, the red pulp showing no mark of violence.

Their note or rather cry varies much with the season. I have noticed no less than three, two of which were used indiscriminately, but the other was peculiar to the spring.

The ox-eye (*Parus major*) occasionally "hammers," as do the wood-peckers and nuthatch. I once shot one in the act. Having but an imperfect view of it, I imagined it must be the barred wood-pecker, a specimen of which I wished to get.

The nun or blue-cap (*P. cæruleus*) does the same, in a less degree. Being in a shed a few months back, my attention was excited by hearing repeated taps on the outside of the coarse deal planking which formed the sides. Looking cautiously through a crevice, I saw a nun actively engaged in ferreting out the small white grub which erodes its channel between the bark and wood of fir. And I have since seen the same bird similarly employed. It gained access to the grub by removing small pieces of bark. J. C. Atkinson.

Hatton, Berwick-on-Tweed, May 11, 1843.

Note on the Habits of the Raven. By W—. H—. Esq.

The raven, or, as we call him in Scotland, the "corbie," is a bold, hardy, and strong-pinioned fowl. He is said to be black, and so he appears at a distance, but when inspected more nearly, his feathers are found to be of a glossy blue. His length is about two feet, and the fourth feather of his wing is the longest. The strength and struc-

ture of his beak and talons indicate his carnivorous nature; and we find in the days of falconry he was trained to that sport: but he does not seem to have recourse to rapine and murder unless irritated, or hard pressed by hunger, for he prefers carrion just entering on a putrid state to a victim recently slain. He is known throughout the old continent, from the Arctic seas to the Cape of Good Hope; and in America, from Hudson's Bay to Mexico.* He is seen in the remotest isles of the polar seas, and within the torrid zone; and is the only fowl whose character remains unchanged by the extremes of heat and cold. He constantly traverses the mountain regions; and, breathing a pure atmosphere, he lives to a great age, and is able to make the most laborious flights from one country to another.

The corbie is well known to the shepherd on all the hilly tracts of Scotland. His common cry is *croak*, but when in a state of excitement he utters another sound, which, if I could manage to express by letters, I should spell thus — *whii-ur:* this is repeated with great rapidity, a strong accent being laid on the two *ii*s, and the *ur* or last syllable seeming to proceed from a collapsing of the throat after its distension in pronouncing the first. With this cry he very commonly intermixes another, something like *clung*, uttered very much as by a human voice, only a little wilder in the sound. The ravens are excited to these cries when the shepherd or his dog seems likely to discover a carcass on which they have been rioting and feasting.

In ravens, the senses of sight and smell are remarkably acute and powerful. Perched usually on some tall cliff that commands a wide survey, these faculties are in constant and rapid exercise, and all the movements of the bird are regulated in accordance with the information thus procured. The smell of death is so grateful to them, that they utter a loud croak of satisfaction instantly on perceiving it. In

* The reader is referred to the Prince of Musignano's 'Comparative List of the Birds of Europe and North America.' It will be there seen that the talented author considers the American representative of our corbie or raven to be the Corvus Catototl of Wagler, and that the "southern parts" of N. America alone are assigned to it as a locality, (p. 28): but Mr. Wilson speaks of the raven as being numerous at the falls of Niagara; Dr. Richardson says it is abundant in the fur countries of North America; and Mr. Audubon states that it occasionally breeds in the mountainous parts of South Carolina. We are therefore inclined to agree with our correspondent in considering the true raven common to both continents, and to doubt whether the Corvus Corax of Wilson be identical with the Mexican raven, as supposed by the Prince of Musignano. There are apparently two American species; for it seems scarcely probable that the wedge-tailed or Mexican raven is the bird noticed so far north. See also Mr. Yarrell's 'History of British Birds,' ii. 123.—*Ed.*

passing over sheep, if a tainted smell is perceptible, they cry vehemently. From this propensity in the raven to announce his satisfaction in the smell of death, has probably arisen the common notion that he is aware of its approach among the human race, and foretells it by his croakings. I have no doubt the idea is founded in truth, although I think the coming event is not communicated to the raven by any immediate or supernatural impulse, but that in passing over a human habitation from which a sickly or cadaverous smell may escape, it is perfectly natural for him to announce his perception of it by his cries.

Shakspeare, however, takes a different view from this, and represents the raven as being seized with an immediate and supernatural impulse in foreshowing the death of Duncan by his croaking. He makes Lady Macbeth say,—

> "The raven himself is hoarse
> That croaks the fatal entrance of Duncan
> Under my battlements." *

Duncan, when he entered Lady Macbeth's castle, was in perfect health, but Shakspeare wrote in conformity with the legend, and, indeed, the general belief of the country; and he well knew the passage would take a firm hold on the human mind.

The raven lives at perpetual variance with all the other feathered tribes. Even those species which are far his superiors he annoys incessantly with his attacks, especially when loaded with food, carrying it either to their young, or to a spot where they can devour it without interruption. I once saw a goshawk carrying what I supposed to be a grouse; this was evidently dead, and, sticking out behind the bird, gave it a very curious appearance. Three or four corbies were high in the air, making, from every quarter, repeated attacks on the goshawk, and endeavouring to rob him of his prey. At length, one of them was just striking the noble bird, when, relaxing his hold, the dead creature, whatever it might be, fell straight for the earth. The hawk dived after it with a rapidity perfectly astonishing, and, I think,

* Othello also says,—

> "It comes o'er my memory
> As doth the raven o'er th' infected house,
> Boding to all."

And in Marlowe's 'Jew of Malta,' this passage occurs:—

> "The sad presaging raven tells
> The sick man's passport in her hollow beak;
> And, in the shadow of the silent night,
> Doth shake contagion from her sable wing."

See also the history of the raven in Wilson's 'American Ornithology.'—*Ed.*

before it had descended thirty fathoms, struck his talons into it, and bore it safely away from among his angry assailants.

Nor is this enmity with the corbie confined to the feathered tribes; sundry of our quadrupeds live in constant warfare with the ill-conditioned fowl. If you see a corbie hovering and screaming over a linn or athwart the face of a rock, you may be sure that some animal has attracted his attention. Perhaps a fox is basking on a sunny slope; or the wild cat, cautiously seeking a safe footing whence to spring on some unwary bird that has its nest among the cliffs; or perhaps the supple weasel, sporting about or examining every cranny to find a safe retreat: — I have seen the corbie vexing each of these. The fox will sometimes stretch up his neck and snap at his assailant, when he has made a sudden dive, but the bird eludes the danger, and continues his persecution as before.

The corbie, thus feared by some creatures, hated by others, and most especially detested by the shepherd, on account of certain bloody designs against his fleecy charge, whenever driven by hunger to the attack,—makes his nest in the deepest retirement, in solitude the most inaccessible. He selects a leafless, sapless branch of some stunted tree—a mountain birch or service—jutting out from the face of a perpendicular rock, and hanging over an abyss hundreds of fathoms deep,—the bottom often beset with sharp and pointed rocks. It makes one shudder to think of a living creature being precipitated from the top; yet here the female corbie sits secure, and far more fearless, in far less agitation of spirits, than if her nest were placed in a flowery meadow. The nest is constructed of the decayed stems of heather, skilfully and carefully wattled together with twigs of other trees. A layer of moss is next supplied to fill the interstices, and thus render the mass more compact: this layer is thickest at the bottom, and in places, where the outwork of heather has been made too slight, the inside is partially lined with sprigs of the fly-bent, but principally with wool. Here are deposited the eggs, and here the callow brood are fed and nourished, and kept dry and warm. The eggs are five, six, or seven in number, of a bluish colour, blotched with irregular spots of brown. The order in which they are deposited is scarcely ever seen, for it rarely happens that a human being can approach sufficiently near for the purpose. The young corbies, however, are seldom permitted to escape; for the shepherd, seeking the spot, perilous though it be, smashes the eggs with stones hurled from above, and batters the nest to pieces. He sometimes postpones his revenge until the young ones, full grown and fat, are peeping over the brink of the

nest, and almost ready to abandon it altogether. He would always delay his attack till this period, but as the young advance in age and size, the more extensively and recklessly do their parents cater for their support.

When ravens set out on a long journey they always travel in pairs, and so high in the air, that were it not for their frequent crying, they would escape notice altogether. So great is the height at which they fly, that no cliff or peak, however lofty, can cause them to swerve from the direct course on which they are bent. W—. H—.

Stobo Hope, May, 1843.

Enquiry.—Does the Female Sky-lark ever sing? It has been a question in dispute whether the female sky-lark (*Alauda arvensis*) sings or not. That she sometimes *attempts* to do so I have no longer any doubt; for the other morning, walking in the fields, up sprang a lark from his "dewy couch," and with his throat full of music and his heart full of joy, rode higher and higher, bringing to my mind those beautiful lines by Wordsworth, addressed to the sky-lark, in which he apostrophizes it as—

"Type of the wise who soar but never roam;
True to the kindred points of heaven and home."

When he had got through about the half of his song, and was preparing to descend, up rose another candidate for attention, mimicing every action of the first, now hurrying upwards as though in haste to get beyond the clouds, now shooting a little to the right or to the left, then pausing for a moment suspended on vibrating wings, again springing upwards, and so on, as larks are wont to do on a sunny morning; but alas, this was only a dumb show, or at least as nearly pantomimic as would consist with a faint sparrow-like "chittering" uttered ever and anon. When wearied with its exertions, this would-be songstress descended precipitately *secundum artem*, and rejoined her mate, who, no doubt, felt considerable surprise at the ambitious vagaries of his *cara sposa*. So miserable a performance involuntarily brought to my mind those of a similar character emanating from another section of the female part of creation; to the authors of which one of the leading reviewers lately administered some judicious advice, saying, that instead of imposing upon the world with their literary pretensions, "they ought to be contented with marking pinafores and labelling pots of jam."—*Edwin Brown; Burton-on-Trent, May* 1, 1843.

Note on the arrival of a few summer Birds of Passage in the interior of E. Lothian, during the years 1841-2.

	1841.	1842.		1841.	1842.
Swift,	May 5	May 8	Garden Warbler,	May 11	May 19
Swallow,	April 17	May 5	Black cap Warbler,	May 6	April 24
House martin	April 21	May 6	White-throat Warbler,	May 30	May 2
Bank martin	April 21	April 30	Yellow wood-wren	April 27	April 24
Cuckoo	May 6	——	Willow wood-wren	April 27	April 23
Whin bush-chat	May 11	May 2	Sedge reedling	May 13	——
Redstart	May 11	——			

These notes were made solely for my own amusement; and having more important matters to attend to, it is impossible, during this busy season, to command much time for such delightful recreations. Let these considerations plead some apology for the meagerness and unsatisfactory nature of this paper. The localities haunted by some of the birds not mentioned above, are situated at a considerable distance from my residence, whilst others are comparatively rare in this county, or I have failed to observe the date of their arrival in the two years specified. I have therefore endeavoured to supply the deficiency, by giving a few general or comparative dates.

Night-jar arrives the fourth week in May to the first week in June.
Ring-ouzel, ... second or third week in April.
Grey flycatcher, ... fourth week in May to first week in June.
Wheatear ..... first or second week in April.
Lesser whitethroat second or third week in May.
Tree pipit ..... first or second week in May.

I have only once heard the grasshopper warbler in this neighbourhood. My friend, Mr. John MacGillivray, who is now exploring the interior of Java, found a nest, containing four eggs, of the marsh reedling (*Calamoherpe arundinacea*) near a pond in this neighbourhood, which, contrary to its usual custom, was built on the ground: it is an extremely rare bird in Scotland. The pied wagtail departs annually about the middle of October, and commonly returns in the second or third week in March; whilst the grey wagtail (*Motacilla Boarula*) is a constant winter resident. The observations of my friend, Mr. A. Jerdon, of Boujedward, Roxburghshire, coincide with this statement; whereas Prof. MacGillivray, in his admirable 'History of British Birds,' remarks, — "From the middle division of Scotland, it shifts southward in the end of autumn, and even from the southern division the greater part migrate, although it is not uncommon to meet with individuals about Edinburgh through the winter and spring," — (ii. 240). This is one of the many curious facts elicited by local observation, for which it is impossible to account. The yellow wagtail is a very rare straggler: the reed-bunting is a winter resident, but most of them go south in autumn: the quail occurs only as a rare straggler in this neighbourhood, but in two or three of our sea-coast parishes it is an annual visitant, arriving about the end of May. Most of our summer birds leave this county in September. In the above-mentioned volume of Prof. MacGillivray's work, will be found a very accurate and instructive paper on "The Summer Birds of the Lothians."—*Archibald Hepburn; Whittingham, May* 1, 1843.

Note on the arrival of some of the Summer Birds at Boujedward, near Jedburgh.

	1841.	1842.		1841.	1842.
Swift,	May 2	May 1	Garden warbler	May 18	May 13
Swallow	April 27	April 29	Black-cap ditto	May 5	April 22
House martin	May 8	May 23	Whitethroat	May 5	May 3
Bank martin	April 27	April 27	Yellow wood-wren	May 6	April 30
Cuckoo	May 18	May 2	Willow wood-wren	April 27	April 23
Grey fly-catcher	May 12	June 10	Tree pipit	April 30	April 27

The house-martins were scarce in 1842, and the grey fly-catcher very early in 1841. —*Archibald Jerdon; Boujedward, near Jedburgh, May* 2, 1843.

Note on the arrival of Summer Birds near Leicester. I have more than once made up my mind to throw off a few rough notes on the habits of our woodland birds, in order that you might transcribe them into the pages of 'The Zoologist;' but "non ge-

nerant aquilæ columbas," and therefore I hope a "chaffy leaf" on the arrival of some species of summer migrants in Leicestershire may not prove altogether uninteresting to the ornithological readers of your periodical. Migration has been about ten days earlier in this district than it was in the spring of 1842; while from the prevalence of cold and dry easterly winds, succeeding the season of the equinox, observers might naturally have expected that the time of "the coming of birds" would be signally retarded. Several species of insects came abroad on wing much earlier this season than I have observed for several years past, especially those belonging to our diurnal Lepidoptera. On the 31st of March, the chiff-chaff (*Sylvia Hippolais*) was heard in the plantations of Tooley park, throwing its wild wood notes o'er leafless bough and flowerless path. Ray's wagtail (*Motacilla Raii*), I observed on the 7th of April, upon the sheltered and warm pastures within the mural walls of the Abbey of Leicester. The swallow (*Hirundo rustica*) was observed, April 9th, hawking for flies over the low and sheltered grounds beside the river Soar, near to Leicester castle. The wryneck (*Yunx Torquilla*) was heard to emit its kestril-like cry on the 9th of April, among the elms of Stoney-gate house: but the martin (*Hirundo urbica*) and sand-martin (*H. riparia*) were not seen in this district till the 18th. On that day the cry of the cuckoo (*Cuculus canorus*) was heard in the woodlands of Ansty and Newton Linford; and in Bradgate park, on the 18th, I also observed the whin-chat (*Saxicola rubetra*), stone-chat (*S. rubicola*), and fallow-chat (*S. Œnanthe*). The redstart (*Sylvia Phœnicura*) appeared on the 19th, at the ruins, in Bradgate park; and in Ansty lordship, on the same day, I observed the whitethroat (*S. cinerea*). The full, mellow and rich minstrelsy of the black-cap (*S. atricapilla*) I heard on the 19th of April, emitted from the boughs of some tall poplars growing beside the mill below Grooby pool. On the same day the "*weet weet*" of the sandpiper (*Tringa hypoleucos*) fell upon the ripple of the same water. The merry note of the tree pipit (*Anthus arboreus*) awoke our woodlands on the 19th; while our osier-holts and willow-beds drank in the sweet music of the willow-warbler (*Sylvia Trochilus*). The sedge-warbler (*S. Phragmitis*) and reed-warblers' (*S. arundinacea*) "babblings" I heard on the 20th in the willow-bed skirting the Soar below Leicester castle. The summer cry of the land-rail (*Rallus Crex*), was heard in the woodlands of Ansty on the 30th; and on May 3rd I observed a pair of swifts sailing over the village of Aylestone, in a north-easterly direction. "Swifts arrive in pairs in the middle districts of our island;" in that respect they differ essentially in their economy from the true Hirundines. But it would, I am sure, aid the cause of scientific research, were your Cornish correspondents to record their observations on the manners of these interesting migrants. Mr. Yarrell and Prof. MacGillivray, in their Histories of British Birds, are both silent on the subject; which is somewhat remarkable, especially in the latter writer, whose history of the swift (*Cypselus murarius*) is very elaborate and interesting. Mr. Bree, I know, is of opinion, that the number of swifts visiting our shores annually decreases; but whatever lack of numbers may take place in the vicinity of Coventry and Allesley, many years' close observation on their periodical shiftings, indicate no such decline in their numbers, so far as they have been observed by me in Leicestershire.—*James Harley; Leicester, May* 5, 1843.

Note on the occurrence of the White-winged Crossbill in Scotland. A white-winged crossbill (*Loxia leucoptera*) was shot in this neighbourhood in the month of February, 1841. I had an opportunity of examining the bird, which had been sent to a gunsmith in Jedburgh to be stuffed, and it appeared to me to be a full-grown female, but of this I cannot be certain. Small flocks of the common crossbill sometimes visit us

to feed on the seeds of the larch. They are generally seen in spring. — *Archibald Jerdon ; Boujedward, Roxburghshire, May* 12, 1843.

Note on the Siskin. In March, 1841, a small party of siskins (*Carduelis spinus*) frequented this neighbourhood for a few days. They fed on the seeds of the alder, on small larvæ concealed in the flower-buds of the elm, which they extracted with great dexterity, and on a small species of insect which abounded upon the branches of the larch, especially around the base of the leaf buds. I am no entomologist, and am therefore unable to name the insects. The siskin seems to be a lively little bird, and in this respect resembles its not very distant relation, the greenfinch. Its habits are also very analogous to those of another allied species, the lesser red-poll (*Linaria minor*). This is the only instance in which I ever saw the siskin; but it is most probable that it breeds somewhere either in England or Scotland, as it has been seen in the latter country in the months of May, August and September. One authenticated instance of its having bred in Kincardineshire, is recorded in the third volume of Macgillivray's ' British Birds,' which excellent work I would strongly recommend to the readers of ' The Zoologist.'—*Id.*

Note on a nest of the Ring-dove. In my morning rambles last spring I discovered the nest of a ring-dove placed in a young Scotch fir, about three feet from the ground, containing, to my surprise, three eggs, one of the three was much less than the other two; I mention this on account of the rare occurrence of this bird having more than two eggs.—*Vivian Walmesley ; Westwood House, Wigan, Lancashire, May*, 1843.

Note on the occurrence of the Reed-warbler in Lancashire. It is with pleasure that I am able to make known, through your interesting magazine, the appearance of the reed-warbler (*Salicaria arundinacea* of Selby) in this neighbourhood. I am not aware of its occurrence farther north than Derbyshire. It is a sweet songster, and its imitative powers are truly wonderful. I shall give it every protection in my power, hoping my trouble may be amply repaid by its reappearance next spring. I am sure the like treatment to other rare species of birds in this country would be a means of their becoming regular periodical visitors, or permanent settlers.—*Id.*

Note on the arrival of the Summer Birds of Passage at Epping, in 1843.

Goat-sucker, *Capr. europæus*,	... May 7	Blackcap, *Curruca atricapilla*,	...April 17
Swift, *Cypselus Apus*,	..... May 7	Nightingale, *Luscinia Philomela*,	April 17
House-martin, *Chelidon urbica*,	... May 1	Redstart, *Ruticilla Phœnicura*,	...Mar. 25
Sand-martin, *Cotyle riparia*,	.....April 8	Whinchat, *Saxicola rubetra*,	.....April 17
Swallow, *Hirundo rustica*,	.....April 4	Wheatear, *Vitiflora Œnanthe*,	...Mar. 21
Sedge-warbler, *Cal. Phragmitis*,	April 18	Tree pipit, *Anthus arboreus*,	.....April 8
Wood-wren, *Phyllopn. sibilatrix*,	April 16	Yellow wagtail, *Budytes Rayi*,	...April 16
Willow-wren, *P. Trochilus*,	.....Mar. 28	Spotted flycatcher, *Butalis grisola*,	May 2
Lesser pettychaps, *P. rufa*,	.....Mar. 18	Red-backed shrike, *En. Collurio*,	May 2
Lesser whitethroat, *Syl. Curruca*,	April 22	Wryneck, *Yunx Torquilla*,	.....April 3
Whitethroat, *S. cinerea*,	.....April 16	Cuckoo, *Cuculus Canorus*,	.....April 16
Greater pettychaps, *Cur. hortens.*	April 23	Turtle dove, *Turtur auritus*,	.....April 23

The house-martins were remarkably late in their appearance here this spring, and are much less numerous than usual. The willow-wrens arrived earlier than I had ever before known them: I saw many on the 29th of March. The redstarts arrived early, and in great numbers. The whinchat, although in former years one of our most abundant visitors, for the last two or three seasons has been very scarce. I have not

seen more than one or two pairs anywhere in the neighbourhood this spring. — *Henry Doubleday; Epping, May*, 1843.

Note on the Kestril. The commencement of the nest of a kestril (*Falco tinnunculus*) having been noticed near Oxford, a gin-trap was set in it, and five male birds were taken on successive days, without the occurrence of a female. The last of the number was a young bird of the year, in complete female plumage. I may mention that I have noticed a difference in the changes of plumage in this bird; the plumage of *all* the young males is, I believe, identical with that of the female during the first year—but in some the narrow black bars on the tail remain through the second year, though the ground colour has changed to grey; while in others the black bars disappear altogether, except the broad one near the tip, with the first change of plumage; and the male colouring is at once complete.—*F. Holme; Oxford, May* 15, 1843.

Note on the occurrence of the Eared Grebe at Oxford. A fine male specimen of the eared grebe (*Podiceps auritus*), in full nuptial plumage, was shot in Port Meadow, close to Oxford, about a month since.—*Id. May* 31, 1843.

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*Notice of White's Selborne.**

White's Selborne! There is a charm about the very name! It is intertwined with our earliest knowledge of Natural History; it calls up the most pleasant ideas of birds, and their nests, and their migrations: and wherefore is it that this unassuming name, this unpretending volume, has such a charm? Why is each of its readers ready to say of himself, — "And I also am a naturalist"? Is it not that the author has stripped his subject of all the pedantry in which others had invested it? Well might Linnæus say, "*verbositas præsentis sæculi calamitas artis;*" and if true *then*, how much more true *now!* It is this verbosity — this "*vox et præterea nihil*" — that disgusts an enquirer, and leads him to look on Natural History as a science of words rather than of things. Then again, the constant appeal to the dead languages, when our own affords words and phrases adapted to harmonious and expressive description, is a constant stumbling-block to the learner. White, though a peculiarly elegant scholar, a man whose memory was stored and overflowing with classic lore, writes the most pure, unpretending, and graceful English that ever subserved the purpose of innocent instruction.

White's attention was ever on the alert to observe: nothing seems to escape him. The arrival and departure of birds, the commence-

* The Natural History of Selborne. By the late Rev. Gilbert White, M.A. A new edition, with Notes by the Rev. Leonard Jenyns, M.A., F.L.S., &c. London: Van Voorst. 1843.

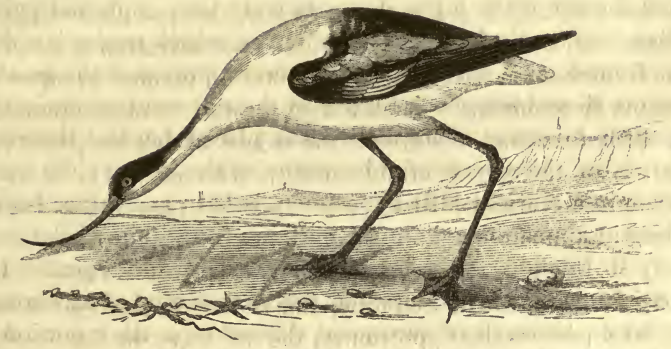
ment and cessation of their song, the site, form and materials of their nests, and a thousand other facts, previously disregarded, were to him matters of the deepest interest, and were recorded with a care and precision which even now are rarely equalled. The 'Natural History of Selborne' is an accumulation of such records, a vocabulary of facts; and might we be allowed its utterance, we should express a wish, almost a trust, that 'The Zoologist,' now in the dawn of its existence, and comparatively unknown, may eventually become such a vocabulary; not confined to a parish, or to a county; — not limited to the writings of an individual, whose sphere of observation must of necessity be restricted; but embracing the entire kingdom, whether for observations or observers. Such a work would become essential alike to the grave historian of nature, who would enrich his pages with its treasures, and to the youthful student, who thirsts for a sufficient knowledge of Natural History to give a zest to his rambles in the forests and the fields.

Truly it does not fall to the lot of all men to attain such a proficiency as the historian of Selborne, nor is it desirable that it should; few indeed possess the opportunity, the patience, the leisure, the zeal, to achieve it. But then, White was but one—we are many; and surely the wider field of observation, surely the increased number of observers, will compensate for the inferiority to our great model and master, which each individually will be ready to admit. There is, moreover, something exactly to our taste in the pleasing way in which the historian of Selborne bespeaks the favorable consideration of the scientific Barrington: — "You are a gentleman of great candour, and one that will make allowances, especially when the writer professes to be an *out-door naturalist*, one that takes his observations from the subject itself, and not from the writings of others." It is our own case exactly; we feel that we have to plead for the *allowances* of the men of books; we are *out-door naturalists;* we take our observations *from the subject itself;* taking for granted the view of the scientific, that this *is* the lowest branch of the tree of knowledge, we content ourselves with gathering the fruit placed so abundantly within our reach.

We cannot afford space to review at length works that have reached so many editions; the fact itself is a criterion of excellence. But we may say that the present edition is nicely got up, has few editorial notes, and is peculiarly free from the technicalities of science: it is, moreover, beautifully illustrated, and is one of the prettiest presents that a juvenile naturalist could receive. K.

Notes on the Birds of Sussex. By A. E. Knox, Esq., M.A.

(Continued from p. 140).



The Avocet, (*Recurvirostra Avocetta*).

The Little Bittern. — The general cultivation of waste lands, and the drainage of extensive pieces of water (the natural consequences of an increasing population and an improved system of agriculture), are gradually banishing from the interior of the county most of the scarcer wading and swimming birds, and has even rendered many, which were once numerous, comparatively rare.

I have therefore much pleasure in recording the occurrence of the little bittern (*Botaurus minutus*) in Sussex. The specimen to which I refer is an adult male, and was shot on the 7th of last May near Pulborough, on the banks of a pond abounding in aquatic plants, in the grounds of the Rev. Mr. Austin, the Rector of that parish, through whose kindness the bird has since come into my possession.

Avocet and Spoonbill.—Few persons have inspected a good collection of British birds, even in a cursory manner, or turned over the leaves of an illustrated work on Ornithology, without having noticed the singular form of the beak of the avocet (*Recurvirostra Avocetta*). I well remember, while yet a child, how strongly my attention was arrested by the admirable figure of this bird in my favorite Bewick, and

many were my juvenile speculations as to the intention of nature in endowing it with a beak so grotesque and unusual.

Several years afterwards, while examining a fine British specimen, I was struck by the peculiar formation of the tip of the bill, which appeared to me to be so slender and exquisitely delicate as to render it impossible for the bird to thrust it into the sand or mud in search of insects or worms, after the manner of the Tringidæ and Scolopacidæ (sandpipers, snipes, woodcocks, &c.) In the latter family (the Scolopacidæ) the tip of the bill is comparatively large, soft, and peculiarly sensitive, and amply furnished with nerves, which render it a delicate organ of touch, and, as Mr. Yarrell observes, proves of the greatest assistance to these birds when boring in the soft sand or mud, by enabling them to detect their food when placed beyond the reach of sight. Now the reverse of this applies to the avocet; the tip of the bill, even in a recently killed specimen, is hard and rather brittle, resembling in appearance a minute portion of very thin whalebone, and scarcely so thick as the point of the finest crowquill pen. I could not help fancying that Nature had therefore turned it upwards, as it were, out of the reach of harm, and allotted to another portion of the beak the duty of searching for and detecting the food of the bird.

I felt strengthened in this opinion from observing that the depression and flattening of the bill throughout the greater part of its length, produced, at the curve, a sharpness of the outer edges of the mandibles, which appeared to me to be precisely of such a form as would render the passing of that part of the bill underneath the sand, by means of a horizontal motion from right to left, and *vice versâ*, an easy and natural operation.

Never having seen this bird in a wild state, although I have passed much time in pursuit of water-fowl on various parts of the sea-coast of Great Britain and Ireland, I had no opportunity of verifying my conjectures until lately, when A. T. Dodd, Esq., of Chichester, an excellent naturalist, to whose zeal and liberality the Museum in that town is indebted for the acquisition of a valuable collection of British birds, favored me with some facts connected with the occurrence of the spoonbill and the avocet in that neighbourhood. Recent specimens of both these birds had been brought to him by an intelligent person of whose accuracy of observation he entertained no doubt, and from whom he learned the following particulars relative to their manner of feeding.

"He had observed that the mode adopted by the spoonbill, was by ploughing the soft sand or mud from side to side, with its bill, to the

depth of about a quarter of an inch, by which he supposed it collected small marine insects and worms, while it continued to work the bill all the time, precisely in the manner of a duck.

"At a late period he saw a flock of five avocets at Pagham harbour, about six miles from Chichester. They were particularly tame; on discharging his gun two were killed and one wounded: the survivors however did not attempt to fly away, until he had advanced to pick up the dead birds. He had previously for some time observed their mode of feeding, and noticed the same ploughing of the sand, as in the spoonbill, but with this difference, that the avocet ploughed with *the convexity* of the bill.

"Two of these avocets are now in the Chichester Museum; the third (the wounded one) was purchased by Mr. Tuffnell of Mundham, who placed it in his garden, where it lived for a short time, and was at last killed by a cat. Here the same action was observed of ploughing or mowing from right to left along the surface of the grass, or rather brushing it from side to side."

The wood-cut at page 225, will give a tolerably correct idea of the attitude of the bird when in the act of procuring its food.

Raven. — The raven, although still to be found breeding in some parts of the county favorable to its nidification, is much less numerous as a species, and more partially distributed here than in former years. This in some measure is to be attributed to the gradual disappearance from our woods and parks of most of the tall old trees in which they loved to build, and partly to the absence of that superstitious veneration with which this bird is still regarded in the North of England.

A pair of ravens used to build until very lately in the ruins of Bramber Castle, near Steyning; but continued persecution has, I understand, effectually banished them from that neighbourhood.

As these birds breed very early in the spring, the young are generally fledged about the latter end of March or the beginning of April. After that time they are not to be found in the vicinity of their nests, but, accompanied by their young ones, the old birds seek an open country without trees or human habitations, where, secure from sudden surprise, they superintend their education in the art of flying.

A pair of ravens with two or three young ones have frequently been observed thus engaged, at this time of the year, on the South Downs, near the Devil's Dyke. On one occasion, the latter, when apparently fatigued by their early lesson, alighted on the ground, and did not then exhibit that wary dread of man which might have been expected,

but, in spite of the loud admonitory croaking of the parent birds, who hovered over them in the air, and evinced every sign of anxiety and uneasiness, they allowed the observer to approach within a short distance, before they finally took flight and followed their conductors to a neighbouring hill.

In Petworth Park, in a clump of unusually tall old beech trees, whose trunks have been denuded by time of all their lower branches, the raven occasionally breeds. I was not aware of this fact until early last March, when, as I was riding in the neighbourhood of these trees, my attention was arrested by the never-to-be-mistaken croak of a raven, and the loud chattering of a flock of jackdaws.

I soon perceived that these were the peculiar objects of his hatred and hostility; for after dashing into the midst of them, and performing several rapid evolutions in the air round about them, he succeeded in effectually driving them to a considerable distance from his nest. During this manœuvre, the great size of the raven became more apparent than when viewed alone, and his power of flight was advantageously contrasted with that of his smaller congener. The latter, indeed, appeared to bear precisely the same relation to him in point of size, that starlings do to rooks when seen in company with each other.

This raven's nest was placed in a fork on the very summit of one of the highest of these trees, while the hollow trunks of many of them (almost all the trees being internally decayed) were tenanted by a numerous colony of jackdaws. Some of the apertures through which they entered were so near the ground as to enable me to reach them when on horseback, while others were situated at a much greater height. These conducted to the chambers in which the nests were placed, and which were generally far removed from the external orifice by which the birds entered their tower-like habitation.

On thrusting an elastic rod upwards into some of these passages, I found it impossible to arrive at the further extremity of the apartment, while a few cavities of smaller dimensions were within reach of my hand, and contained nests constructed of short dry sticks, some of which were in a yet unfinished state, while in others one or two eggs had been deposited.

The next day I returned to the place, provided with a spy-glass, for the purpose of observation. On my arrival I found that the ravens were absent, and that the jackdaws, availing themselves of this, had congregated in considerable numbers, and were as busily employed about their habitations as a hive of bees; some carrying materials for the completion of their yet unfinished nests, others conveying food to

their mates, and apparently making the most of their time during the absence of their tormentor.

There being no covert or brushwood at hand, and the branches of the trees being yet leafless, I was unable to conceal myself effectually, but having lain down at the foot of the tree containing the nest, I awaited the return of the ravens.

Nearly an hour elapsed before the arrival of the male bird, and I was first made aware of his approach by the consternation which it appeared to spread among the jackdaws. Like most animals under similar circumstances, when conscious of the approach of danger, they rapidly collected their forces on a single tree, keeping up all the time an incessant chattering, each bird shifting his position rapidly from bough to bough, while the raven, who held some food in his beak, satisfied himself on this occasion with two or three swoops into the terrified crowd, and having routed the greater part of them, he approached the tree in which his nest was placed.

Before arriving there, however, he evidently became aware of my presence, and dropping his prey, which proved to be a rat, he ascended in the air to a great height, in circular gyrations after the manner of a falcon, where he was soon joined by his consort, and the two birds continued to soar above my head while I remained there, uttering not only their usual hoarse croak, but also an extraordinary sound resembling the exclamation Oh! loudly and clearly ejaculated. At first I could scarcely persuade myself that it proceeded from the throat of either of the ravens, but my doubts were soon dispelled, for there was no human being within sight, and after carefully examining one of the birds for some time with the glass, I observed that each note was preceded by an opening of the beak, the great distance, of course, preventing sight and sound from being simultaneous.

I could not accurately distinguish to which of the birds this exclamation was to be attributed, but it apparently proceeded from one only, which seemed to be the female, or lesser of the two, and if intended to have the effect of imposing silence on its young, proved perfectly successful, for during the two hours that I remained there, the latter never uttered a cry.

With the assistance of ladders firmly fixed together, the nest was reached. It was comfortably lined throughout with the fur of the fallow deer, and contained three young ones, which appeared to have been hatched about a fortnight.

About six years have elapsed since a former pair of ravens built in Petworth Park. The old male was at last shot; this occurred in the

morning, and at three o'clock in the afternoon the survivor had found a help-mate, who continued faithfully to discharge the duties of husband and father until the destruction of the young birds at a later period.

I have much pleasure in recording the following fact, which may, perhaps, serve to assist in the promulgation of those humane and enlightened views so ably advocated by Mr. Waterton in his 'Essays on Natural History.'

Some years ago a pair of ravens used to breed annually in Burton Park, about four miles from Petworth; disappearing from the neighbourhood when their young were fledged, but always returning in the ensuing spring.

The head keeper, better acquainted, it would appear, with the habits of birds than persons of his profession are apt to be, afforded them every protection. He had discovered that they were his best friends. Not a hawk, or weasel, nor indeed any winged or four-footed animal usually designated "vermin," were suffered by the ravens to approach the wood in which stood the tree containing their nest.

Although pheasants and hares abounded in the immediate vicinity, neither these nor their young were ever molested by the ravens. Their foraging expeditions were carried on at a distance, and their food consisted almost entirely of young rabbits, and the decomposed flesh of larger quadrupeds.

This state of things was not to continue. In an evil hour the nest was robbed. All the young ones were taken. The old ravens deserted the place, and have never since returned to their former abode.

A. E. Knox.

New Grove, Petworth, June, 1843.

(To be continued).

Note on the Grey Wagtail. By C. Nicholson, Esq.*

Kendal, June 29, 1843.

Dear Sir,

I send you a letter, received about eighteen months ago, from Mr. Nicholson, of Cowan Head, near Kendal, containing an interesting account of a grey wagtail. In your fifth number (Zool. 136) you have published a somewhat similar statement; but as my friend suggests a different interpretation to the one proposed by Mr. Doubleday, I thought you might like to publish his letter.

I am, Dear Sir, Very truly yours,

Thos. Gough.

* Communicated by Thomas Gough, Esq.

Cowan Head, February 12, 1842.

My dear Gough,

Concerning the "window-peeper," as we call it, which I mentioned in my last latter. Having half an hour to spare this evening, and the incident being fresh on my mind, I will get it off my hands.

This "window-peeper" was a grey wagtail (*Motacilla Boarula*), which came and peeped in at our windows almost every morning, for three months together. It was an exquisitely beautiful bird. The colours of its plumage were as bright as if it had been a dweller within the tropics. I need not say that the ordinary grey wagtail, in fine feather, is a beautiful bird, but this was an *extraordinary* bird, so pretty and so graceful besides. Well, it came to us in the first week in October. Before the blinds of our chamber windows had been drawn up one minute, there it was, pecking at the glass of first one pane and then another. Every morning it came with the same certainty as the morning light. We are not quite free from superstition at our house, and therefore a repetition of these periodical visits began, ere long, to give rise to ominous conjectures. On the morning of the *third* day it was predicted that something was "sure to happen"! I cannot myself boast of being quite superior to all superstitious influences, but I endeavoured to reason in this way, that so fair a visitant could not be a harbinger of woe! If it had been the *owl*, as Chatterton says—

* * "the *dethe-owl* which loude doth synge
To the nyghte-mares as they goe:
Or the *ravenne* that flappes hys wynge
In the briered delle belowe;"

Or the *bat*, or solitary *magpie*,—any of these birds of evil omen might have staggered my un-faith, but I felt quite sure that the grey wagtail, so redolent of beauty and purity, if it were a spiritual manifestation at all, must bring with it "airs from heaven." The *third* day came and went, and the *seventh* day came and went—two mystical periods passed, and yet nothing very extraordinary "happened." Superstitious thoughts now vanished. The stranger, erst looked upon with a kind of awe, now became a welcome friend. The windows were thrown open, and he had a general invitation to "bed and board." But no: my feathered friend conceived that that might be leading to too close an intimacy — too great familiarity — and he preferred the *medium* acquaintanceship of the closed window. When the sash was up, he carefully avoided the vacuum, and flew against the upper

or glazed part of the window, although when the sash was down, the lower panes were his favourites. Please to bear this in mind, whilst we consider what prompted the bird to this curious daily performance. At first I thought there must be some insect food close to the window, which invited him. There was none visible, but might there not be some invisible to human eyes? The windows having the rising beams of the sun upon them, rather favoured this supposition, and for a week or two I was content to watch the bird's manœuvres, and fancied that he was solving (or dis-solving?) a thousand problems each minute of DALTON'S "*atomic* theory." I put some crumbs of wheaten bread upon the window-sill, and as he passed these unheeded by, still jumping and pecking at the window, it must be even as I had supposed. But by and bye came frost, and then *severe frost* throughout the night and morning. Still my window-peeper came, and kept to his morning toil with undeviating constancy, although the blinds were drawn up before the sun had arisen, and a temperature now prevailed in which it was manifestly impossible that any insects could be abroad. I was confined to my room about four or five days in December, and you may conceive how doubly welcome were the constant tappings of my morning visitor during this confinement. I had leisure to watch him more minutely, and now it occurred to me that the bird saw his own image in the window, which peradventure he took for a lost *mate*, and this was the real object of his visits. Thus the first impression connected with him was *fear*, the second, *love*, and the last, *pity*. We deeply sympathized with him in his supposed bereavement; and it seemed hard to tell whether he deserved more pity for the loss of his companion, or for the delusion practised upon him by the mirrored window, where only a false image of his lost mate met his advances. It seemed a sad want of discrimination in the bird; but I could not help reflecting that man—reasoning man—makes many attempts almost as visionary and futile in the pursuit of his loved objects. Our mutual friend, Mr. P——, whom we call the Gilbert White of the district, from his accurate observance of living creatures, came to see me at this time, and was, of course, *introduced* to the wagtail. He inclined at once to the supposition that the bird was a disconsolate widower, and mistook his own "mould of form" for the person of his lost mate. I must not forget to say that the bird never came till the blinds were drawn up, but he was so *immediately* at the window after the first blind was raised, that he must have been watching within sight of the windows, and within a very short distance; and this not casually, but constantly every morning! Is not this a curious part

of the history? Before he departed, a manifest change had taken place in the hues of his plumage. The bright colours I so extolled at first, were very much faded in "the winter of his discontent." He finally took leave of us on the 28th of January, and I expect you will join in my natural anxiety about him, and look forward with some curiosity to ascertain whether he comes again in the ensuing autumn. I shall be very happy to renew the acquaintance, though I do not wish him to remain in "single blessedness."

Your's very truly,

C. NICHOLSON.

Notes on the Redshank. By The Rev. J. C. ATKINSON.

The Redshank (*Totanus Calidris*).

THERE are large portions of land on various parts of our coasts, (I refer more particularly to our eastern coast, south of Yorkshire), which, except to the sportsman, the naturalist, and, at some seasons, the sheep-owner, are almost without interest: and besides, to some persons who have a wholesome fear of the ague, they would be altogether forbidden ground, were they somewhat more attractive than

they are. I mean the salterns or saltings, *i. e.* tracts of land without the sea wall, and covered by the sea at high water, more or less completely, according to the state of the tide. These are intersected by multitudes of rills and creeks,* in such manner that, except by following the sheep-paths, it is difficult to make progress in any direction, without crossing a rill, for a space of a hundred yards, and almost impossible to proceed fifty in the same straight line.

I have spent many hours, at all seasons of the year, on these salterns, and among the birds which are to be found in such places one of the most common is the redshank (*Totanus Calidris*, Selby). When the tide has gone down, it is generally to be found in various parts of the creeks, in the bottom of which a small stream of muddy water moves along. Here, by taking advantage of the windings of the creek, and showing yourself as little as possible, you may surprise these wary and vigilant birds, and, at the least, shoot *at them*, if such be your object; but it does not follow as a matter of course that you will *kill them*, even supposing your aim to have been correct. Frequently have I, when thinking myself sure of my bird, on pulling the trigger, seen it dart perpendicularly upwards before I was myself aware that the charge was ignited, *so that when my shot "told" in the mud below them, they were flying in safety eight or ten feet higher than they were when my sight was taken.* Its quick eye must have caught the almost imperceptible flash which issues from the cap, — as is certainly the case with some of the water birds: I may mention the great northern diver (*Colymbus glacialis*), the crested grebe (*Podiceps cristatus*), the teal (*Anas Crecca*), &c. It is possible the motion of the hammer may be seen too, but I think that that of itself is insufficient to make the bird deviate from its line of flight. I am not aware that any other bird has this habit: those I have referred to as escaping from the shot on seeing the flash, do it by quitting one element for another, — the air for the water, — and not by deviating from their course on the wing. As may be supposed, this took place more commonly when a flint gun was used, but it was by no means invariable even in that case.

While the tide is at its height, and their feeding grounds consequently deep under water, they sit, unless disturbed, on some small temporary island of a few feet or paces in diameter, formed by a part of the salterns which happens to be of a higher level than the rest;

* The creeks are deep muddy *arteries*, as it were, to the arm of the sea, whence they proceed, varying much in width; the rills are the veins, much narrower than the creeks.

and so, at this particular time, they are seen in flocks; but immediately the receding tide permits them to return to their search after food, they disperse. In the winter months, during the time of low water, you seldom see so many as half-a-dozen in company: in the autumn there is a slight deviation from this habit: I have seen them at that time of the year spring from their feeding-ground in lots of fifteen or twenty, and have known two or more killed at once by shooting among them.

Their food I take to be marine insects, shrimps, small fry, &c., with the worms which may chance to lie exposed. I have never seen any traces of either digging or boring left by them. I do not, however, mean to assert that they never do bore.

When suddenly alarmed, their flight at its commencement is very irregular and tortuous, but soon becomes tolerably steady. It is rapid, but rarely protracted.

Their cry is loud and shrill, and may consequently be heard at a great distance, and I think may, without much aid from imagination, be denominated expressive. At times it is plaintively querulous, but more generally, if I may so express myself, objurgatory and scolding. From their habit of making a great outcry when disturbed, they are not great favorites with the gunners or wild fowl shooters, who, during the winter, are numerous on the coasts I have named.

Towards the end of May and in June they are very busily engaged in the work of propagation; and, at this time, though particularly vigilant and suspicious at the approach of man or dog (particularly the latter) to the place in which their eggs are deposited, they do not venture very near the cause of alarm if it be a man, though they jealously watch all his movements as long as he remains near their haunts. On his first showing himself, perhaps only a single bird is seen, who comes rapidly towards him, ceaselessly uttering her complaining note: in a few seconds another and another come up, and they continue to fly round the intruder in wide circles, rarely coming within gun-shot. His dog, if he have one, meets with attention far more close: he is completely persecuted: now one bird dashes down, and appears literally to *fly* in his face; a second sweeps over his back, almost touching him; while a third comes upon him from behind: in short, much the same scene occurs as when a number of swallows espy a cat taking a noon-day walk on a house-top, only the scene in question is accompanied with the incessant utterance of single short plaintive notes.

If you happen to revisit the spot after the lapse of ten or fifteen

days, you will then yourself experience the treatment your dog lately met with. They have frequently come so close to me when among their haunts at such a time, that had I extended my arm (and they had not on that account deviated from their flight) I could have seized them with my hand. They will even settle on the ground within a few paces of you, exclaiming pitifully all the time you remain among them. The cause of this change in their manner is, I imagine, that now their young have been hatched, and they seek, by exposure of themselves, to take off your attention from the nestlings. I have never been fortunate enough to find the young, though I have more than once engaged in the search, and been assisted by a dog which had some dexterity in finding their nests. The word nest, by the way, is almost a compliment, for it is often nothing more than a slight depression in the earth, on one of the highest parts of the salterns. The eggs are however occasionally washed away notwithstanding this precaution. I have found several nests in the midst of grass and other herbage; these resembled very much, though of course much smaller, the seat rabbits make for themselves in a meadow drain or the coarse grass close under a hedge; and the bird when sitting must be almost completely concealed: but they are frequently quite open, and with hardly a blade of grass near them, and the most elaborate have only a few withered stalks laid in the bottom. I have never found more than four eggs, nor less than two: the former number I take to be the usual one. They are large in proportion to the size of the bird, and placed in the nest without much regard to symmetry of figure.

Early in August, the hatch having been some time over, and the young birds acquired some power of flight, they may be and are shot in considerable numbers, as they are then more easily got at, — the young probably from want of power to take long flights, and the old from being unwilling to leave their offspring. They are sometimes prepared for the table, and are by some thought good eating. I have heard the preference given to them over a snipe, but this was before the snipe had come to its perfection, viz. the middle of September.

About the end of August and September I have seen them in very large flocks, consisting of some hundreds probably, sitting at the edge of the smaller creeks waiting for the recession of the water. It was quite out of the question to get near them on such occasions, as every pair of eyes was at liberty to watch the approach of the visitor. The notes uttered by the birds when thus assembled are totally different from those they emit at any other time. Most persons are fa-

miliar with the sounds made by a flock of sparrows when going to roost late in the autumn and winter, — a combination of a number of voices: very similar is the sound I am referring to, though individual notes sound less shrilly, and have less of the chiding character about them. When the tide has gone down, the large flocks break up into the smaller groups of twenty or thirty, alluded to above.

When the redshank "mobs" (the provincial phrase for its bold and reckless approach to man in the breeding season) its flight is somewhat peculiar. It is slow, with regular beats of the wings; and after each pulsation you may notice that the wings are *kept depressed* for a very perceptible space of time.

The nests of the pewit gull* (*Larus ridibundus*) and the oyster-catcher (*Hæmatopus Ostralegus*) are to be met with occasionally in the same places with the redshank's; and I have been amused at times with the diverse habits of these birds when affected by the same motives. I remember on one occasion I had found a gull's nest and an oyster-catcher's within a few paces of each other, and had most convincing testimony, from the distress evinced by two or three redshanks, that one of theirs, at least, was not far distant. The latter conducted themselves after the manner I have endeavoured to describe; the gulls hovered over my head, now and then making a stoop at me, and almost brushing my hat with their wings, not making much outcry; but the oyster-catchers, though evidently watching my every motion, kept at a distance, flying up and down a large creek that was near, uneasily shifting their place if they happened to perch for a few moments, and uttering at short intervals their whistling note.

A redshank or two may sometimes be seen among a flock of oxbirds† (*Tringa alpina* and *cinclus*), which they seem to accompany in their flights for a short time; but it may be accounted for by supposing the companionship accidental; both kinds of birds procuring their food in similar places; and that the same cause — sudden alarm for instance—had caused them to take flight together.

J. C. Atkinson.

Halton, Berwick-on-Tweed, June, 1843.

* The name of pewit-gull, given by Bewick as a synonyme of his black-headed gull, is now almost universally abandoned for the latter name.—*Ed.*

† This little bird is the dunlin and purre of Pennant, Montague and Bewick, all these authors having considered it a distinct species when in the winter plumage; hence the double names of alpina and cinclus. M. Meyer, in order to avoid this confusion, called the bird Tringa variabilis, and his nomenclature is followed by Temminck, Selby, Gould, and Jenyns.—*Ed.*

Notes on various Birds. By Robert Dick Duncan, Esq.

Allow me to express the delight with which I have hitherto perused 'The Zoologist.' If the following remarks contain anything worthy of record in that periodical, I shall be much gratified.

The Skylark is frequently called the "bird of the dawn," and doubtless the designation is most appropriate. Who can wander forth on a May morning without having recalled to his mind Shakspeare's beautiful song in Cymbeline?

> "Hark! hark! the lark at heaven's gate sings,
> And Phœbus 'gins arise,
> His steeds to water at those springs
> On chaliced flowers that lies;
> And winking Mary-buds begin
> To ope their golden eyes," &c.

A few weeks ago, however, whilst returning home from an evening ramble in Drumshoreland moor, I heard, long after sunset, two skylarks singing their songs. The night was too dark for me accurately to ascertain the hour; but it was so late that it was impossible to recognise, at any distance, individual hedges or fields or woods. As I passed along a lea, a lark commenced warbling in a low inward tone. It seemed as if sitting by the side of its nest, and singing its mate asleep. Soon, however, the notes swelled louder and louder, till the still air of night resounded with its song. The unusual circumstance in a short time awakened another lark in an adjoining field, and then the two emulous creatures strained every nerve. It was a delightful hour to me. As I gazed up into the firmament, and—the earth being enveloped in darkness—could only think of the worlds above, while listening to the songs of the larks, I felt as if for once I had an angel's ear, and heard the music of the spheres.

The Titlark (*Anthus arboreus*), is generally reckoned a 'rara avis' in the Lothians. This year, however, three pairs have taken up their summer residence in our neighbourhood. For a long time I confounded this bird with its friend the titling; but, as in the case of Mr. Weir, the discovery of its nest, and its almost invariable habit of rising from and alighting on trees, at length convinced me that I had the pleasure of being acquainted with two of the pipit family.

The Fieldfare. The roost of the fieldfares has often been adverted to. Selby, Jardine, Thompson, &c., contrary to the assertions of other naturalists, tell us that they occasionally resort to pines and

evergreens. My own observations are confirmatory of their statements. This spring, in passing through the moor to which I have already referred, I came on a large flock of this thrush, evidently gone to rest for the night. The majority of the birds were roosting in tall furze bushes, and on the branches of young fir trees; whilst the others had taken shelter amongst the long grass and heath.

Yellow Hammer or Yellow Bunting. On the 20th of April last year, my attention was directed towards a small hedge by a melancholy chirp. On approaching the spot I found a yellow bunting perched within a few yards of me, uttering a most distressing cry.—I approached still nearer, thinking that perhaps it might be unable to fly away; and my presence did not in the least disturb it, till I actually put forth my hand to take it. When it was gone, I looked around to ascertain the cause of this strange circumstance, but could only see a number of peewits at a little distance, performing their grotesque antics in the air, while the curlew afar off was whistling above the moor. After a time, however, I discovered the cause. Above me a hawk was sailing round and round: its wings were evidently fully expanded and motionless, although at considerable intervals a quivering or quick beating for a few moments was visible: I watched its gyrations till it disappeared in the height. It is probable it had been examining the district, but being disturbed by my arrival had ascended. Which species of falcon it was I know not, as I was not sufficiently near it to determine.

The Rook. A few days before this occurrence I was greatly delighted in witnessing the manœuvres of half-a-dozen rooks, engaged in persecuting a sparrow-hawk. The rooks were occupied in picking up worms, grubs, &c., from a newly ploughed field, when the hawk glided over them at an elevation of about two feet from the ground. In an instant the rooks were on the wing; and as he continued his flight, apparently unconcerned, they flew along side of him, and then mounting in the air came down with a sweep till within a few feet of his back. Even this did not seem to disturb the self-possession of the beautiful creature: onwards he flew, skimming over the fields, and bounding over the fences, till he was far beyond the reach of his black persecutors. During this cuffing not a song was heard proceeding either from the neighbouring woods or from the heavens above; but no sooner was the bird of prey out of sight than the woods were vocal, and the air echoed with the glad songs of a hundred larks.

The effect produced by the outburst of the latter was overpowering. In general we see and hear the lark ascend the sky, or listen to his notes as they gradually wax louder and louder while we near the place where he is singing, but in the present instance it was entirely different. This moment all was silent, as if no living creature breathed save myself, the falcon and his tormentors ; the next, the whole heavens resounded with the voices of many happy beings.

Curious Note of a Bird. — An individual passing through Drumshoreland, at any time of the year—except during frost and snow—is almost certain of hearing a peculiar note, somewhat resembling the sound produced by an angler unwinding his line. I do not refer to the continuous trill of the grasshopper lark : the note in question is by no means a steady, laboured one, like that warbler's. Nor is it emitted while the bird is stationary or concealed; but while it takes an undulating flight, as in the act of alighting on the top of a tall bush or tree. Surely it must proceed from a linnet, but of this I cannot be certain ; neither know I to which species of this family it must be attributed. It would give me great pleasure to find the note adverted to by any one who has observed it.

The Wheatear.—In this wooded part of the Lothians the wheatear (*Saxicola Œnanthe*) is a rare visitant: indeed I have only seen it once within ten miles of us. In the early part of the summer of 1841 a nest of this bird was found here, in a situation somewhat singular, namely, in the very heart of a village. It was pointed out to me by Mr. Archibald Walker, Colinton, and was placed in a hole in a dilapidated wall of an old ruin, once the parish church of East Calder. The nest was bulky, but extremely shallow. In it lay seven eggs : in colour, for a time, I could scarcely distinguish them from those of the hedge-warbler; but in form they were more pointed, and a little longer than any of the accentor's I have yet seen. On a careful comparison, I found that the egg of the wheatear had about a shade of green more than that of the hedge-chanter. By this characteristic, and by the elongated shape of the former, the eggs of these two birds may be easily distinguished.

The Nightingale. — In almost every work on British Ornithology, it is asserted that the nightingale is never heard north of the Tweed. Individual instances of its occurrence in Scotland, however, are authenticated. Allow me to mention to your readers a fact which a few

years ago I communicated to Professor Macgillivray, and which he has thought worthy of record in his admirable work on British birds. Perhaps I may be permitted to do so in nearly the words I then used. "The nightingales arrived in Calder wood, in Mid Lothian, in the early part of the summer of 1826—a remarkably warm season. I cannot remember so far back, but creditable eye and ear witnesses, among whom I may mention my father, the Rev. Dr. Duncan, gave me the information. Before and about midnight, while the full moon shone bright and clear, the superior warble of the male was first heard, which soon attracted a number of admiring individuals, who hastened to the spot, supposing it at first to be an escaped canary. The owner of the wood was extremely anxious to preserve them, thinking that perhaps they might propagate; but with all his care and attention, some malicious and selfish individuals attempted to take them with bird-lime, but failing in their efforts, they afterwards shot the male, upon which the female left the wood." *

The Meadow Pipit generally commences its song in the middle of April. On the 24th of March, 1841, however, my delight and astonishment were equally great on hearing it begin. I thought I heard its ascending note; and on looking round, true to the signal, there was the little flutterer, hovering in the air above the moor, about to commence its musical descent. This bird is only known here by the provincial name of *moss-cheeper*.

The Swallow.—The enthusiastic panegyric by Mr Hepburn on the author of the 'Natural History of Selborne' (Zool. 146), gave me the highest pleasure. Indeed the very mention of the name—'Gilbert White,' must fill the heart of every naturalist with delightful emotions. For my own part, I regard his little work with feelings akin to religious veneration. Well do I recollect the day when my father put it into my hands. The heavens were bright and the earth was beautiful; and as I wandered through the woods, perusing its pages—anon listening to the songs of the birds, or pulling a fragrant flower—I felt as if I had changed my state of being, and entered another world.—From that time the study of Nature has been with me a favourite pursuit. Taught by experience, I am always inclined, when a person professes a desire to become a naturalist, to bid him read the 'Natural History of Selborne.' If it interests and fascinates him, well; if not, he may bid an eternal adieu to the study of the beauties of Na-

* Macgillivray's 'British Birds,' ii. 334.

ture. But to come to the more immediate object of this communication. Mr. Hepburn suggests the propriety of ascertaining "the geographical limits within which the swallow breeds in the chimneys of dwelling-houses." This proposal is surely worthy of particular attention. That the chimney swallow should seldom, if ever, be found nestling in the places, from its haunting which we are led to suppose it derives its name, is a fact calculated to astonish many a British out-door naturalist. During many years only one instance of this bird building in the chimney of a dwelling-house has come under my observation. The house was in Mid Lothian; and the chimney in which the nest was fixed had not been used for nearly a dozen years. I cannot altogether vouch for this statement, as it is long since the occurrence, but the impression is strong on my mind that it is authentic.

House Martin.—Yesterday having occasion to pass under the magnificent viaduct of forty-two arches over the valley of the Almond, on the line of the Edinburgh and Glasgow railway, I was astonished to find that hundreds of window swallows, or martins, were fixing their nests under an ornamental ledge, placed a few feet below the copestones. The little creatures were at work as I passed, and the bed of the river literally swarmed with them, engaged in picking up materials for building. How odd was their appearance when they attempted to run on the sand! Their nestling in such a place appeared to me somewhat singular, as, during the whole day, trains are passing westward and eastward along the viaduct, making a noise loud enough to be heard four or five miles off. ROBERT DICK DUNCAN.

Vale of Almond, Mid Calder, Edinburghshire,
June 10, 1843.

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*Notes on the Habits of a Masked Gull in confinement.**

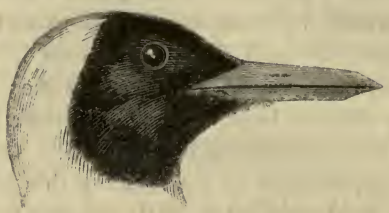
By THOMAS GOUGH, Esq.

THE stormy weather which occurred in the latter end of November, 1841, compelled large flocks of sea-gulls to resort to our meadows and pastures in search of food. One of these birds came into my possession in the following manner. A number had alighted in a field pastured by sheep; and whether in default of suitable food, or tempted

* This bird is the Larus capistratus, or masked gull, of Fleming and Yarrell, and the brown-headed gull of Jenyns and Eyton. Sketches of the heads of this and the species next mentioned have been made from Mr. Yarrell's figures, to show the difference.

by some delicious parasite, it is not easy to determine, but the greater part of the gulls mounted upon the backs of the astonished animals. The specimen which I procured having got its feet entangled among the wool, was injured by some means during an effort to rise. Disabled for a moment, the bird fell to the ground, and was as quickly picked up by a boy. The species was new to me; its small size, short tarsus and short slender beak, brought it under Temminck's Larus capistratus, the brown-headed gull of Eyton. On our first acquaintance, I had an opportunity of introducing this feathered stranger to a party of friends at the tea-table. His sociability was amusing. He sat quietly upon a volume of Temminck's Ornithology, occasionally enjoying a mouthful of warm dressed fish, and permitted his various dimensions to be taken without much resistance. The bird, upon being turned into a poultry-yard, betrayed signs of shyness and timidity. This exhibition of cowardice attracted the attention of the ordinary inhabitants, who had already eyed him with suspicion; and he was destined, from his first introduction, to be buffeted by every bantam hen that he came near. After having endured this persecution for some hours with considerable patience, he assumed a new and more successful character. His energies being recruited by food, and his spirits revived by a thorough washing and re-arrangement of his feathers, he hit upon the following expedient to quell the insults of his jealous opponents. On the approach of a combatant, he threw himself into the most hideous attitude of defence. The head and neck were retracted between the uplifted pinions; his beak was half-opened, and the feathers of his whole body were erected; giving him a most metamorphosed appearance. I was amused at the first encounter which took place after he had thus endeavoured to play the feathered Mathews. A stout square-built bantam hen was his first opponent; and it was ridiculous to witness the impression made upon her courage by the hobgoblin which stood before her. The gull kept his ground, and the bantam put on her most warlike aspect; but all to no purpose. Her arched and crested neck gradually dropped, until at length her courage entirely failed, and she ran across the yard, now and then looking behind, to be but the more convinced of the reality of her alarm. This successful experiment added hourly to the confidence and comfort of the gull: indeed his boldness increased so far as to induce him once or twice to become absolutely pugnaceous. From this time he was able to live in peace with his former insolent antagonists, partaking daily of their food, and joining occasionally in their roosting-pen: but still I am inclined to attribute his ultimate

success and continued peace, more to his character of invention than to his powers as a warrior.



The Masked Gull, (*Larus capistratus*).

The brown-headed or masked gull is easily kept in confinement. He was invited to change his diet, by having a few earth-worms scattered over a basin of boiled potatoes: by these means he always swallowed a small portion of vegetable food; and in a few days he devoured potatoes alone, with as much avidity as he did when they were mixed with worms. When a large dry lump of potato was met with, he never attempted to swallow it without first having recourse to the following manœuvre. He carried the unpalateable morsel in his beak, with head erect, to a channel of water, dropped it in, and having softened and reduced it to fragments, heartily enjoyed his potato. Occasionally also he stole away with a choice piece to a private corner, where he could eat his meal without being disturbed by his hungry companions. When sufficiently domesticated he was turned into a garden, where a friendship was quickly established between him and an old favorite, the lesser black-backed gull. A little chastisement from this tyrant taught him his proper place, and he soon found the necessity of always being second to visit the meat and water dish. In the evenings every flower-border was visited by both birds in quest of worms; and in these excursions the larger species always claimed precedence. But notwithstanding this advantage, his success was generally much inferior to that of his diminutive companion: for though priority of search secured him all the large earth-worms which were lying upon the surface, yet his greediness after the best prey caused him to overlook all the small worms and snails, which rarely escaped the quick-sighted skill of the masked gull. This feathered domestic was destined to have a short reign, for unfortunately, one day he wandered beyond his prescribed limits and was taken up by a boy, who, I afterwards learned, had kept him confined beneath a basket, where he refused all sustenance, and very soon died. This accident put an end to my observations on his change of plumage, for he was beginning

to assume the brown cap of spring in place of the mottled pate which he had worn all winter. Since my acquaintance with this species, I have frequently inspected large flocks of black-headed gulls, but have never been so fortunate as to meet with another masked gull.

THOMAS GOUGH.

Kendal, June, 1843.

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*Note on the Habits of the Black-headed Gull.**

By ARCHIBALD JERDON, Esq.

The Black-headed Gull, (*Larus ridibundus*).

A COLONY of black-headed gulls breeds in a large marsh at Ancrum, in this neighbourhood. They arrive at their summer quarters generally in the month of March, and leave us again about the end of July.

During the spring months they chiefly follow the plough, after the manner of rooks, for the purpose of obtaining worms and insects. — Many of them also may be seen at this season by the river side.

In summer, they frequent water a good deal more. Multitudes are to be seen at all times by the river Teviot, which is their chief resort, but they often make excursions up its tributary streams. When in search of food by the river, they fly at the height of about ten feet or so from the surface; and whenever they espy their object, whether fish or insect, they lower their course, and, skimming the surface of the water, pick it up. They almost always follow the windings of the river.

* This bird is the Larus ridibundus, or the Black-headed Gull, of Yarrell, Bewick, Fleming, Selby, and Jenyns: it is often called the Brown-headed Gull, a name also applied to the bird previously noticed.—*Ed.*

During the heat of the day many of them disperse up and down throughout the corn, pasture, or fallow fields, in search of food.—These they beat with great diligence, traversing them again and again at the height of about ten feet, as before. When any suitable object meets their eye, they immediately round to, alight on the ground, and, generally keeping their wings extended upwards, at an acute angle with their bodies, seize it.

The black-headed gull is a lively, graceful bird, and has, like its congeners, a very elegant and buoyant mode of flight. A peculiarity in its habits, which I have not seen noticed, is, that it is very crepuscular. I have repeatedly seen numbers of them flying about long after sun-set; and lately I have remarked that they come abroad in the evening, apparently for the purpose of catching insects, which they do on the wing, after the manner of the swallow tribe. On the 22nd of this month, I watched the proceedings of a number of these birds by the banks of the Jed, between 9 and 10 o'clock. There was a small grove of trees at a short distance from the river, to which some of them resorted, flying from one extremity to the other, and returning again, all the while seemingly engaged in the pursuit of insects of some kind. Their motions were much the same as those of swallows, although somewhat slower; they sometimes remained hovering and suspended while catching an insect, so long and so near the trees that I thought they were going to alight. Others of them scoured the fields and the water-side, and others again followed the course of the river, but all apparently intent on the capture of some winged prey. It was very curious to observe these gulls hawking about exactly like the Hirundines. In Yarrell's 'British Birds' it is mentioned that the Rev. Mr. Lubbock had seen the brown-headed gull engaged in catching cockchafers; whether the insects in this case were cockchafers, I am unable to say.

ARCHIBALD JERDON.

Boujedward, June, 1843.

Note on the late departure of the Fieldfare. I saw a solitary fieldfare (*Turdus pilaris*) here as late as May 19. On the 10th, in the evening, I had seen a large flock, which descended from some height in the air to roost in some trees in a neighbouring park.—*J. C. Atkinson; Berwick-on-Tweed, June*, 1843.

Note on the Nests of Martins on Sand-stone Rocks. Many nests of martins (*Hirundo urbica*) are built on some of the precipitous rocks of sand-stone, which, in various places, over-hang the river White-adder, flowing through Berwickshire into the Tweed. They are placed wherever a projecting ledge gives them shelter from above. In one place, last autumn, I counted from thirty to thirty-five, at a height of perhaps forty-

five or fifty feet from the water. Where a stratum of sand or loose earth overlies the sand-stone, the face of which has been exposed, whether by quarrying or aqueous action, the holes of the sand-martin (*Hirundo riparia*) may be seen. So that I quite expect soon to find a colony of house-martins and another of sand-martins, the one just above the other.—*Id.*

Note on the occurrence of rare Birds in Lincolnshire. Having for some years past been in the practice of penning down the observations I have made on the habits &c. of the feathered tenants of our "sea-girt isle," I was induced, from a perusal of your magazine, to believe that the following list of "rara aves," which have come under my notice during my residence in the rich, but apparently little explored, district, from whence this communication is dated, would perhaps prove interesting to some of your readers. If such should be the case, I should be most happy to forward any further information respecting the species herein named, it is in my power to give.

Peregrine falcon, *Falco peregrinus*
Merlin, *Falco Æsalon*
Goshawk, *Falco palumbarius*
Rough-legged buzzard, *Falco lagopus*
Ash-coloured shrike, *Lanius excubitor*
Common cormorant, *Pelecanus Carbo*
Shag, *Pelecanus cristatus*
Solan goose, *Pelecanus Bassanus*
Dun diver, *Mergus Merganser*
Red-breasted merganser, *Mergus serrator*
Red-throated diver, *Colymbus septentrio-*
Black-throated diver, *C. arcticus* [*nalis*
Bridled guillemot, *Uria lacrymans*
Razor-bill, *Alca torda*
Little auk, *Alca alle*
Richardson's skua, *Lestris Richardsonii*
Bittern, *Ardea stellaris*
Crossbill, *Loxia curvirostra*
Snow-bunting, *Emberiza nivalis*
Brambling, *Fringilla montifringilla*
Twite, *Linota montium*
Lesser red-poll, *Linota linaria*
Pied fly-catcher, *Muscicapa atricapilla*
Great snipe, *Scolopax major*

These specimens have all been obtained by me since the year 1840.—*S. Willoughby; Bratoft, near Spilsby, Lincolnshire; June* 15, 1843.

Note on the arrival of the Summer Birds of Passage near Sheffield, in 1843.

Wheatear, *Vitiflora Œnanthe*, ...	April 3	Tree lark, *Anthus arboreus*, ...	April 20
Ring ousel, *Merula Torquata*, ...	4	Garden warbler, *Curruca hortensis* ...	21
Swallow, *Hirundo rustica*, ...	12	Black-cap warbler, *C. atricapilla* ...	23
Willow-wren, *Phyllopneuste Tro-* ...	15	Whitethroat, *Sylvia cinerea*	May 4
Cuckoo, *Cuculus canorus*, [*chilus* ...	18	Swift, *Cypselus Apus*,..... ...	6
Wryneck, *Yunx Torquilla*, ...	19	Lesser Whitethroat, *Syl. Curruca* ...	7
Redstart, *Ruticilla Phœnicura*	19	Spotted flycatcher, *Butalis grisola* ...	7

—*John Heppenstall; Upperthorpe, near Sheffield, June* 19, 1843.

Note on the occurrence of Hawks near Sheffield.

Osprey, *Pandion Haliaëtos.* (Zool. 14.)
Rough-legged buzzard, *Butaëtes lagopus.* Pretty abundant during the winter of 1839-40, and seen most winters.
Buzzard, *Buteo vulgaris.* Formerly common, now quite rare.
Bee-hawk, *Pernis apivorus.* Six specimens have been obtained, one recently, by the keepers of Sir George Sitwell.
Kite, *Milvus regalis.*
Peregrine falcon, *Falco peregrinus.* Not unfrequent.
Hobby, *Falco subbuteo.* Pretty generally distributed during the summer season
Merlin, *Falco Æsalon.* A winter visitant
Red-legged hobby, *Falco vespertinus.* One of these birds is in the Museum of our Literary and Philosophical Society, which I have no doubt was obtained in the neighbourhood.
Kestrel, *Cerchneis tinnunculus.* Common.

Sparrow-hawk, *Accipiter Nisus*. Common.
Brown harrier, *Circus æruginosus*.
Marsh harrier, *Strigiceps pygargus*. Not r.
Montagu's harrier, *Strigiceps cineraceus*. Thorne moors, where it breeds.—*Id.*

Note on the voracity of the Gull Tribe. The following singular instance of the voracity of the gull tribe occurred here last week. A man who was shooting on the banks of the river, seeing something which had the appearance of an eel half swallowed hanging from the mouth of a gull which was flying overhead, fired at the bird, and on taking it up, found, not an eel, but—five tallow candles attached to a piece of thread, to the other end of which was fastened a sixth, the latter having been *almost entirely swallowed*. I have seen some of the candles, which are about twelve inches in length, with cotton wicks, and of a very common description,—such as are used on board the fishing boats, from the deck of one of which he had probably taken them. That which was swallowed I observed was broken in three places by the operation. I did not see the bird, but, judging from the man's description, and from one of the wings which he showed me, I have no doubt it was the common gull, (*Larus canus*). *William R. Fisher; Great Yarmouth, June* 21, 1843.

Note on the times of arrival of some of the Summer Birds of Passage at Yarmouth, in 1843.

Stonechat, *Sylvia rubicola*, about	April 11	Sand-martin, *Hirundo riparia*, ...	April 30
Wheatear, *Vitiflora Œnanthe*, ...	Mar. 22	Dotterel, *Charadrius Morinellus*,	Mar. 25
Blackcap, *Sylvia atricapilla*, ...	April 4	Redshanks, *Scolopax Calidris*, ...	April 1
Bearded tit, *Parus biarmicus*, ...	1	Reeve (fem.) *Tringa pugnax*, ...	Mar. 25
Cuckoo, *Cuculus canorus*, ...	14	Spotted crake, *Gallinula porzana*	April 8
Swallow, *Hirundo rustica*, ...	26	Little grebe, *Podiceps minor*, ...	8

The bearded tit, though it is not, I believe, usually considered a migratory species, regularly appears here in spring and autumn. It is probable that part of those which are bred in this country, leave us in winter and return the following spring.

The cuckoo, I am told, was heard several days prior to that which I have mentioned, but I did not meet with it before that time.

The time of arrival of the reeve I have stated to be March 25. I saw no ruffs for some days afterwards. May they not arrive separately, the reeves first?

The eggs of the spotted crake were taken the first week in May; those of the redshank on the 27th of April.

The little grebe, which does not breed anywhere near us, also regularly appears in spring and autumn.

Hobby, (*Falco subbuteo*). I saw a specimen at a dealer's the last week in February. As this bird had probably remained the whole winter, I have not inserted it in the list of summer birds.

Common snipe, (*Scolopax Gallinago*). Two eggs of this bird were brought to Yarmouth for sale, so early as April 1; the nest contained four.—*Id. June* 22, 1843.

Note on the times of departure of some of the Winter Birds of Passage from Yarmouth, in 1843.

Short-eared owl, *Strix brachyotos*,	April 3	Hooded crow, *Corvus cornix*, ...	April 26
Snow bunting, *Emberiza nivalis*,		Golden plover, *Charadr. pluvialis*	May 25
the last flock seen, ...	Mar. 22	Turnstone, *Tringa interpres*, ...	22
A single specimen taken.....	April 12	Sanderling, *Charadrius Calidris*, ...	24

At which times the three last-named birds had all attained their full summer plumage.

Jack snipe, *Scolopax Gallinula*, April 12
Knot, *Tringa canutus*, in full summer plumage, ...May 20
Woodcock, *Scolopax rusticola*, ...April 3 — *Id.*

Observations on the Moulting of Birds. I observe in the June number (Zool. 190) a note on the pied wagtail, in which mention is made of a *spring* moult. I had understood that in general the moulting of birds took place some time in autumn, and that the changes in the colour of the plumage, which, in many instances, occur in the breeding season, were caused by the wearing of the tips of the feathers. In many birds, as, for example, the waders, there are great differences of colour at different seasons; these perhaps may be attributed to a double moult. The subject of moulting deserves, I think, more attention than it has hitherto met with. Would any of the readers of 'The Zoologist' favour us with a paper on it? Do birds change the whole of their plumage at one time; or, if not, what portions? Are the quills and tail-feathers shed and renewed annually? Finally, does moulting take place more than once a year? These are questions which I have never seen satisfactorily answered.—*Archibald Jerdon; Boujedward, June*, 1843.

Note on the more frequent occurrence of the Woodcock. There is some consolation to the British naturalist, in the reflection, that whilst the majority of our birds are becoming more rare every year, owing to increased cultivation of the soil; some few species more frequently occur, especially in the breeding season. The nest of the woodcock is now almost commonly found in some districts, though formerly of so rare occurrence. Mr. Southwell, gamekeeper to the Marquis of Anglesey, in May last discovered *three* nests of young woodcocks at Beaudesert. This is the first time I have heard of this species breeding in the neighbourhood, although snipes have *frequently* been seen, in the summer season. — *Edwin Brown; Burton-on-Trent, June* 29, 1843.

Notes upon the Reptiles mentioned in Shakspeare's Plays.

By Robert Patterson, Esq., V.P. Nat. Hist. Soc. Belfast.

It is proposed in the present paper to examine the notices of reptiles scattered throughout Shakspeare's plays, with a view to ascertain how far they are in accordance with facts now known, or how far they embody the errors and superstitions of other days. Such an enquiry, "figuring the nature of the time deceased," is not in reality valueless, for it serves to bring before us, in new and unexpected lights, some of the mental phenomena of two distant epochs. It makes us view with a kindly and contemplative spirit, the varying phases of society; and while we compare the knowledge of the present time, with that which was current in the reign of Queen Elizabeth, we are tempted to ask if changes no less remarkable may not again occur?—if hypotheses, now gravely propounded as truths, may not yet be held up as curi-

ous errors?—and the future naturalist pronounce their requiem in the words of Banquo, —

> "The earth hath bubbles as the water has,
> And these are of them."?

Adopting as my text-book the very excellent volume of Professor Bell, on British Reptiles, I commence with the Testudinata, or tortoises; two species of which, from having been thrown upon our coasts, hold a place in the British Fauna. Their occurrence is, however, so rare, that we may fairly presume Shakspeare had never seen either of these marine turtles in a living state. That he was familiar with the appearance of some species when dead, is more than probable; for among the contents of the apothecary's shop, described by Romeo, we have the tortoise mentioned in connexion with another reptile from tropical climates.

> "And in his needy shop a tortoise hung,
> An alligator stuffed, and other skins
> Of ill-shaped fishes."

That these aquatic animals were classed together by our bard under the common appellation of "fishes," will not to the naturalist seem surprising; even at this day, in common language, and in accordance with popular belief, the same term is applied to the Cetacea. If Shakspeare had ever seen any species alive in England, it was most probably the common land tortoise of the East, — *Testudo Græca.* The apathy and slow movements of this creature may have suggested the epithet which Prospero applies to Caliban —

> "Come forth thou tortoise." — *Tempest, Act* i. *Scene* ii.

To the extreme longevity of the animal no reference is made, though it is one of the most remarkable circumstances connected with its history. One which lived at Peterborough could not have been less than two hundred and twenty years old; and seven bishops had worn the mitre during its sojourn there.* From facts such as these, which the naturalist records, the poet and the novelist draw "patines of bright gold." And hence we read with new delight the beautiful description in Bulwer's 'Last Days of Pompeii,' of a tortoise, which "had been the guest of the place for years before Glaucus purchased it; for years indeed which went beyond the memory of man, and to which tradition assigned an almost incredible date. The house had been built and rebuilt, its possessors had changed and fluctuated — generations had

* Vide note to Sir Wm. Jardine's edition of White's Selborne.

flourished and decayed, and still the tortoise dragged on its slow and unsympathising existence."

If we were to give full credence to the narration of Pliny, we could not doubt, that tortoises in these degenerate days, have lost much of their medicinal virtues, and been sadly "curtailed of their fair proportions;" for he expressly informs us, that "there be found tortoises in the Indian sea, so great that only one shel of them is sufficient for the roufe of a dwelling house"!

Passing by the second order, the Enaliosauria of Coneybeare, under which the different genera of our gigantic fossil reptiles are arranged, we come to the third order, the Loricata, which comprises the alligator and the crocodile. These formidable creatures are known to us only by the writings of travellers in tropical countries, by small alligators brought here occasionally as objects of curiosity, and by the skins of larger individuals exhibited in public museums. Yet, with the exception of some of the larger Mammalia, there are perhaps none of the animals of warmer latitudes with whose appearance and history we are more familiar. Hence no one doubts for a moment the meaning of Mrs. Malaprop, when, with her usual felicity, she speaks of "an allegory on the banks of the Nile."

The accounts given by some ancient writers of the size of some of these reptiles, are such as we might expect from people among whom incorrect and exaggerated ideas were still current. We are told by Pliny, that Regulus encountered in Africa a serpent a hundred and twenty feet long, which he and his army could not subdue, except by discharging against it all their instruments of war (*balistis atque catapultis*). If such ideas of magnitude were still extant in Hamlet's time, we may well imagine he proposes an impossible undertaking, when he asks, in his passion with Laertes,—

> "Woul't drink up Esil? eat a crocodile?
> I'll do't."

In Antony and Cleopatra we are amused with the playful description of the creature given by Antony, in reply to the question of Lepidus — "What manner o' thing is your crocodile?"

> "It is shaped, Sir, like itself, and it is as broad as it hath breadth," &c. &c.

Concluding with the intelligence — "and the tears of it are wet."

In the same scene we have the doctrine of equivocal generation introduced.

> *Lep.*—"Your serpent of Egypt, is bred now of your mud by the operation of your sun; so is your crocodile.
> *Ant.*—"They are so."

The same doctrine peers out upon us in another form, in the language of Othello in his jealous rage against Desdemona.

> "If that the earth could teem with woman's tears,
> Each drop she falls would prove a crocodile."

I know not to which of the old writers the honour belongs, of being the first to promulgate the fable that crocodiles, by their piteous cries, allure travellers to the water, and there destroy them. It seems for a very long period to have been a current article of belief. It does not appear in Pliny, though we find the usual intermixture of fact and fable. In our earliest prose work, the Travels of Sir John Mandeville between the years 1322 and 1356, some of the errors of Pliny are repeated, and we have a brief notice of the tradition that these creatures devour men, weeping while they do so. "In that Contre and be alle Ynde, ben great plentee of Cokodrilles, that is a manner of a long Serpent, as I have seyd before. And in the nyght, thei dwellen in the Watir, and on the day, upon the Lond, in Roches and Caves. And thei ete no mete in all the Wynter: but they lyzn as in a Drem, as don the Serpentes. Theise Serpentes slen men, and thei eten hem wepynge; whan thei eten thei meven the over Jowe, and nought the nether Jowe: and they have no Tonge."

By Purchas in his Pilgrimage the subject is introduced in the brief and casual way that writers adopt when speaking of some well-established truth. "Andrew Battell told me of a huge crocodile, which was reported to have eaten a whole alibamba, that is, a company of eight or nine slaves chained together, and at last payed for his greedinesse: the chain holding him slave, as before it had the negroes, and by his undigestible nature devouring the devourer, remaining in the belly of him, after he was found, in testimony of this victorie. He hath seen them watch, and take their prey, hailing a gennet, man, or other creature, into the waters. A souldier thus drawn in by a crocodile, in shallower waters, with his knife wounded him in the belly and slew him."

That Shakspeare should adopt an opinion so current is what we might naturally expect. He introduces the subject with great effect, in a passage where Queen Margaret compares the arts of Richard, Duke of Gloster, to those employed by the crocodile.

> "Henry, my lord, is cold in great affairs,
> Too full of foolish pity; and Gloster's shew
> Beguiles him, as the mournful crocodile
> With sorrow snares relenting passengers."
>
> *2nd part K. Henry* VI. *Act* iii. *Scene* i.

Having thus glanced at some of the reptiles of foreign countries, we may proceed to such as are indigenous in these islands, and to which, more properly, Mr. Bell's volume is appropriated.

Robert Patterson.

3, College Square North, Belfast.

(To be continued)

Note on the rapid increase of the Polymorphous Muscle (Dreissena polymorpha) *in Great Britain.* By Robt. John Bell, Esq.

It may not, perhaps, be altogether uninteresting to some of your readers, to have pointed out to them a few fresh localities for this beautiful mollusc, which is now becoming generally diffused over the rivers and canals of England. The precise time of its introduction will probably never be correctly ascertained, although its appearance in one place, as a centre from which radii diverge in different directions, may in some degree tend to elucidate its history. Many habitats for this species are mentioned by H. E. Strickland, Esq., in a paper published in the second volume of Charlesworth's continuation of Loudon's 'Magazine of Natural History.' The place to which I would particularly direct your attention, is the Port of Goole, in Yorkshire, belonging to the Aire and Calder Company, where are several large docks for the reception of shipping, and which, I believe, were opened either in 1828 or 1829. In three or four years after this, I was greatly surprised, on seeing the water drawn off a few feet lower than usual, to find the walls of the docks completely covered with this shell; and I do not at all exaggerate when I say, that without much difficulty, pecks might readily have been procured. Here they are to be seen attached by their byssus, not only to the walls, but to stones, fragments of wood, the live shells of Anodon Cygneus, and the dead ones of their own species; and from the numbers of the latter now to be found, it is quite evident that many generations have passed away. One dock is entirely appropriated to the bonding of foreign timber, which frequently remains some months prior to its being reshipped, or floated on rafts down the rivers or canals to the various inland towns; during which time, those pieces which adjoin the sides or touch the bottom are sure to be covered over by this shell. Hence it naturally follows that its distribution over the West Riding of Yorkshire, and the adjacent counties which have any communication with the canals of the Aire and Calder Company, will fail to excite sur-

prise. It is very tenacious of life, and exceedingly prolific, provided the locality be favourable. I found it attached to stones &c. in the river Don, at Conisbro' near Doncaster, in 1836, along with many dead shells, clearly proving that it had been there some time; also in the Barnsley canal.

It is worthy of remark, that as far as the influence of salt water extends into the dock, when the gates are opened into the Ouse for the ingress or egress of vessels, not one solitary individual can be found, the line of demarcation being as perfect as the joint between one stone and another in a wall. My friend Wm. Bean, Esq., of Scarborough, planted it near that place a few years ago; but in a recent communication he states he thinks they have all perished.

In no instance have I been able to discover the crystals mentioned by Mr. Sowerby (Mag. Nat. Hist. ix. 643), though I have examined hundreds of specimens; pearly concretions, however, are not unfrequent. Should this slight sketch prove of any advantage to naturalists, by throwing a little light on the history of this mollusc, the object of the writer will be fully answered; who, having resided many years in the neighbourhood, and watched the subject with attention, simply records the facts as they have fallen under his observation.

It is highly probable that in the first instance this mollusc came attached to timber from the Baltic, and having found a congenial habitat, has multiplied in this extraordinary degree; its tenacity of life being fully capable of sustaining it during the voyage, in the damp hold of a ship.

ROBERT JOHN BELL.

Mickleover House, near Derby,
June 5, 1843.

[The following are extracts from Mr. Strickland's paper referred to above. See also Mag. Nat. Hist. 572 and 643.—*Ed.*]

"From the year 1828 to 1834 inclusive, I was frequently in the habit of conchologising in the Avon, near Evesham, during which period, if the Dreissena polymorpha had inhabited that river, I could scarcely have failed in detecting it. Not the slightest vestige of it however occurred to me during that time. An interval of two years elapsed, in which I was absent from England; and in the beginning of 1837, I was much surprised at finding several specimens of this shell among the refuse on the banks of the river. On further search I found that the Dreissena had become completely established on the beds of gravel in the river; and in the course of an hour I collected several hundred full-grown specimens. There is therefore clear evidence of the recent introduction of this mollusc into the Avon, and of the rapidity with which it has reached maturity and multiplied.

"I have since observed it in the canal between Warwick and Birmingham, and it has also been found in the canals near Wednesbury in Staffordshire.

"In all the cases hitherto cited, this shell has been found in navigable waters,

where its transport has doubtless been effected by means of timber. I only know of one instance to the contrary, which is that of the Leam, at Leamington, where it has been found of a large size by Dr. Lloyd of that place. But though the Leam itself is not navigable, yet it is in the immediate vicinity of the canal, from which the Dreissena has probably been introduced. I have further to add that this shell has lately been *planted* by Mr. Stuchbury of Bristol, in some of the waters near that place.

"It appears desirable to record these particulars, because it may interest some of our field-naturalists to watch the gradual spread of this species over the kingdom. Its propagation is so astonishingly rapid, that it will probably become, in a few years, one of our commonest British shells.

"I lately kept some of these molluscs, of different ages, alive for some time in a basin of water. The full-grown individuals, though they had been torn from their native bed, soon secreted a fresh byssus, and became anchored to the bottom of the basin. It is evident from this, that the byssus, when first secreted, must be in a highly glutinous state, which enables it to become attached to the smooth surface of glazed earthenware. The young individuals still retained the power of locomotion, and crawled like gasteropods over the bottom. They effected this by protruding their foot in advance of the anterior or cardinal end of the shell, and advanced by alternate expansion and contraction of this foot, dragging the shell after them. They indulged their wandering propensities for a few weeks, and then wisely followed the example of their parents, by selecting some convenient nook, to which they attached themselves contentedly for life.

"I further remarked that these molluscs, acephalous though they be, have still an evident perception of light. When in a quiescent state, they kept the shell partly open, with the siphuncular and branchial apertures exposed; but if any object was suddenly brought over them, they immediately receded, and partially closed their valves, although care was taken that no concussion should be given to the basin."—*Mag. Nat. Hist. New Series*, ii. 362.—1838.

Note on the multiplication of Dreissena polymorpha. Those of your readers who study the geographical distribution of animals, may feel interested to know that the small bivalve shell, Dreissena polymorpha, has found its way to various canals and other waters in Leicestershire; and a few days ago, I discovered it in immense numbers in the Grand Trunk Canal, at Burton, adhering to the stones that form the embankments, and to the shells of Anodons and Unios. It is in the latter situation, deep in the mud of the canal, that I find by far the largest specimens; several of these measured more than an inch and a half in length. If this species go on increasing in the same ratio as it must have done, supposing it to have been introduced into Britain only about twenty-five or thirty years,—our canal will shortly become literally paved and lined with its shells.—*Edwin Brown; Burton-on-Trent, June* 29, 1843.

Note on Shells and Crabs at Circular Head, Van Diemen's Land. "Shells are also numerous here, we picked up more than a hundred species. The sand north of the bluff, was sometimes covered with myriads of globular crabs, about the size of a hazel-nut. On going among them, they made a noise like a shower of rain, and by a rotatory motion, in a few seconds, buried themselves in the sand, the surface of which they left covered with pellicles like peas."—*J. Backhouse's 'Narrative of a Visit to the Australian Colonies,' p.* 108.

Report of the Microscopical Society of London.

June 21, 1843. — R. H. Solly, Esq., in the chair.

Read, a paper from William Addison, Esq., of Great Malvern, on "the colourless corpuscles of the blood, the buffy coat, and inflammatory diseases." The author commences by stating, that when a recently drawn drop of blood is placed between two slips of glass, and examined under the microscope, two very distinct kinds of corpuscles may at all times be distinguished, the one being red and the other colourless. Of these the most remarkable are the last: these, when subjected to pressure, retain their circular outline, and appear to be harder or of a firmer consistence than the others. If the drop of blood be taken from an inflamed surface, as a pimple, or the base of a boil, they are found to be very abundant; and in blood taken from the skin of a patient in scarlet fever, or from the spots of any cutaneous disease, they are not only remarkably numerous and conspicuous, but also vary very considerably in size, evidently having molecules or a molecular base in their interior. These colourless corpuscles are also obtained very abundantly from the fluid, or *liquor sanguinis*, at the surface of buffy blood before the fibrine coagulates, mingled with immense multitudes of isolated or free molecules and granules. From various observations he supposed the elements of the blood to consist of, — 1. The red corpuscles. 2. The colourless corpuscles. 3. Molecules and granules in the interior of the colourless corpuscles. 4. Free molecules. 5. The fibrous fibrillæ. And his researches have led him to these conclusions: — 1. That the colourless blood-corpuscle is the central portion of the red corpuscle. 2. That all the different forms of the pus-corpuscle, exudation-cells, and fibrinous globules, are altered colourless blood-corpuscles. And 3. That all the various forms of epithelial cells likewise originate from them, either by a conversion or transformation of the entire corpuscles into these cells, or by the growth of their molecules. He went on to state that these colourless corpuscles appear to enter very largely into the composition of all membrane, contributing, during the process of active nutrition, to form the tissues, and they are also subsequently evolved as pus globules, exudation-cells, or epithelium; and that the red cells or globules in a state of health, take no part either in normal or abnormal nutrition; that is, in such cases they do not combine with or pass into the tissue. When therefore the process of secretion from some epithelial surface in one or more organs is in any way disturbed, the consequence is that these colourless cells accumulate in the blood, and when blood in this state is drawn, the cells from various causes burst, discharging their contents, which consist of molecules and a fibre forming plasma, which last, in a short time, rises to the surface, carrying with it the molecules and other colourless cells which may not have burst, thus producing that more or less tough elastic tissue known by the name of the buffy coat of the blood. Inflammation, therefore, he considers as occurring whenever the colourless blood-cells congregate in the tissues of any organ so as to interfere with its normal function; and so long as this disturbance is confined to these cells, what is termed chronic inflammation is the result; but should it extend so as to interfere with the free circulation of the red corpuscles, then all the phenomena of active inflammation ensue. The author also pointed out that the phenomena presented by scarletina accord perfectly with his views; and stated certain conclusions to which his observations had led him in the treatment of that disease. The concluding part of the paper consisted of observations explanatory of this view of the subject, and the paper was illustrated by several drawings of the colourless blood-corpuscles in the various states therein described. The Society afterwards adjourned until the 18th of October next.—*J. W.*

Note on the Carnivorous Propensity of Mollusks. Seeing in a late number (Zool. 201), a notice of snails devouring insects, perhaps I may mention that about a week ago my attention was attracted by seeing a large earth-worm writhing about in intense agony. On looking in the grass I found that a large black snail was devouring the worm; in the course of half an hour, during which time I watched it, about half of the worm was devoured by its greedy adversary. A friend of mine also tells me that he had seen a snail devouring a beetle, which had accidentally been crushed to death on the garden walk.—*Robert John Bell; Mickleover House, Derby, July* 10, 1843.

Note on the Capture of Lepidoptera near Cambridge. I beg to enclose you a list of rare Lepidoptera captured by myself in the vicinity of Cambridge, in the summer of 1842.

Papilio Machaon. In great abundance in Burwell and Hornsey fens, the latter end of May.

Pontia Metra. Two specimens, taken in June at Shelford.

Leucophasia Sinapis. Taken in the evening by the side of a wood at Stapleford, in July, three specimens.

Vanessa C-album. Found in the same vicinity in July and August, but not in great plenty.

Vanessa Antiopa. After a long chase I succeeded in taking this fine insect at Stapleford, August 14; another specimen was seen on the wing in the grounds of King's College the same week.

Melitæa Cinxia. Two specimens taken at Stapleford, June 15.

Melitæa Euphrosyne. Plentiful in the woods of Stapleford in September.

Hipparchia Semele. Found in tolerable plenty on the Heath near Newmarket, in July.

Thecla Quercûs. Two specimens last August at Shelford; common in Monk's wood.

Thecla Rubi. Found in plenty hovering over the flowers of Rubus cæsius, early in the morning.

Lycæna dispar. Reared several fine specimens from the larvæ found in May on water-docks, at Whittlesea Mere.

Polyommatus Argiolus. Abundant in July, in the chalk-pits on the Gogmagog hills.

Polyommatus Alsus. Abundant in the same locality at the same time.

Polyommatus Corydon. In profusion in the same locality, the male being much more common than the female

Polyommatus Acis. One specimen, a female, taken at Stapleford in a chalk-pit in June.

Nisoniades Tages. Two specimens taken in the same locality, in June.

Cyclopides Paniscus. I reared several from larvæ found in White-wood, feeding on Cynosurus cristatus.

Smerinthus Tiliæ. Plentiful in August, feeding on the elm, lime &c.

Sphinx Convolvuli. I had the good fortune to capture a fine specimen of this rare moth, on an apple-tree, in September.

Chærocampa Celerio. I have seen a specimen of this very rare moth in the collection of my friend, E. Layard, Esq., Camb.; it was taken near Isleham, in that county.

Chærocampa Elpenor. Rather plentiful in the fens of Cambridge and Huntingdonshire.

Chærocampa Porcellus. Found two of the larvæ in the same locality in June, feeding on Galium verum.

Sphecia Fuciformis. One specimen, hovering over the hare-bell, in July.

Sphecia Bombiliformis. I captured eight or ten specimens of this insect at Upware, in the fens, where they were to be found in plenty in May, flying with great swiftness.

Sphecia Apiformis. One specimen at Stapleford, in July.

Sphecia Bembyciformis. Three specimens taken on the osier in Coe fen.

Zeuzera Æsculi. One specimen, a female, taken in July, in the gardens of Christ's College.

Gastropacha Quercifolia. Plentiful, feeding on the sallow in Burwell fen, in company with Lasiocampa Roboris.

Clostera reclusa. A larva found on the poplar in June, at Stapleford.

Notodonta ziczac. Three specimens captured at Stapleford in August.

Pterostoma palpina. Rather plentiful, on the elm, willow, &c.

Petasia cassinea. One specimen, taken in September.

Drymonia Dodonæa. Two specimens in July at Stapleford.

Cerura fuscinula. One taken in July, on the willow.

Cerura bifida. Two specimens in July, in the same locality.

Fumea radiella. One specimen found on the heath, near Newmarket.

Heraclia Dominula. Plentiful in May in the fens, feeding upon the broad-leaved sallow.

Lithosia plumbeolata. Plentiful in the perfect state at Stapleford, in July.

Lithosia gilveola. I captured a specimen of this very rare moth on the 10th of August, at Stapleford.

Lytæa albimacula. A single specimen taken at Whittlesea Mere in August.

Agrotis valligera. One specimen taken in July, near Stapleford.

Agrotis cuneigera. One specimen taken at Whittlesea Mere in August last.

Graphiphora crassa. A single specimen at Shelford, in June.

Hadena remissa. Taken in a wood near Stapleford, in July.

Hadena contigua. Two specimens found on the bark of an oak in August, in the same locality.

Apamea secalina. Taken on Bromus sterilis in June, at Shelford.

Apamea ophiogramma. In the same locality, but not so abundant.

Alucita hexadactyla. Found in August, on a wall at Stapleford.

—*Melville Lee ; Magdalen College, Cambridge, July*, 1843.

Note on the seasons of appearance of Polyommatus Argiolus in Suffolk. Should the following note on the seasons of appearance of Polyommatus Argiolus in Suffolk be deemed of sufficient interest for the pages of 'The Zoologist,' it is at your service. On referring to my register I find that the first specimen of this butterfly I ever possessed (a male), was captured at Kedington on the 9th of May, 1833, and was the only one obtained that year. In 1834 one was taken on the 31st of July, and others on the 1st, 8th, and 12th of August. In 1835 the dates of capture are May 8th, 16th and 19th, June 6th, July 23rd, 27th and 30th, August 1st and 6th: on the 19th of May and the 6th of August it was very abundant. In 1836 I took a male at Lavenham on the 7th of May, which is the earliest date I ever saw it, and as it continued very abundant in the same locality during the whole of that month, I much regret that I did not take more than a supply for my own cabinet, as it has been a very rare insect ever since, and appears now to have wholly disappeared. The two specimens before noticed (Zool. 172) are the last I have seen.— *W. Gaze ; Ballingdon, Sudbury, Suffolk, July* 17, 1843.

Note on the occurrence of Colias Edusa. Judging from Mr. Jordan's remarks (Zool. 176) I presume it may not be wholly without interest, at least to that gentleman, if I state that Colias Edusa was common in the Isle of Wight in the year 1804. It was

my first introduction to the insect, and I was much gratified by taking many specimens from the 18th of August to the 1st of October, on which latter day I took a very brilliant specimen, the last I saw for the season. I also observed the insect in still greater abundance the same year, on the opposite coast of Hampshire. It is only occasionally that I have it in my power to speak from experience of the appearance of Colias Edusa; for here in Warwickshire it seems to be an insect of great rarity: to the best of my knowledge I never saw more than two examples of it in this county; these occurred September 16, 1808, and August 16, 1811. And I mention these dates, because, in those seasons when the insect does occur in this neighbourhood (where it certainly seems to be a rare and merely accidental visitant), I think it may have been abundant in the situations where it is more usually found. Who knows but our Warwickshire clouded yellows so seldom seen may have strayed from a maritime county? I shall have great pleasure in forwarding the success of 'The Zoologist' as far as lies in my power, for its own sake, as I think it a most useful and interesting work, the discontinuance of which would, in my judgment, be a loss to the cause of Natural History, and to all those who love the fields and woods more than the jargon of science, which latter, it strikes me, is carried to such an excess as rather to impede than advance the study of Nature. Here, in 'The Zoologist,' is a convenient receptacle for all those facts and observations, which, but for such a periodical, would probably be lost, or at least never recorded for the benefit of naturalists in general.—*W. T. Bree; Allesley Rectory, near Coventry, June* 23, 1843.

Note on the capture of Colias Hyale. I enclose you an accurate figure of a beautiful variety of Colias Hyale, male, captured in August, 1842, by my friend, J. Harley Esq. It was flying swiftly, on a very cloudy day, in a lane near Market-Harborough, Leicestershire, and is now deposited in our cabinet of local insects, belonging to the Literary and Philosophical Society's Museum. The chief difference from the figure and description of a male C. Hyale, in the work of Messrs. Westwood and Humphreys, consists in the *uninterrupted* band of rich sulphur that completely divides the broad, black, apical margin of the fore wings, and the discoidal spot being intensely black. The hind wings are considerably rounder at the apex,—more like C. Edusa,—with the margins very faintly marked with black, and the discoidal spot or spots being scarcely discernable. The size is smaller than that usually given, and the *contour* of the insect strikingly different from the figure referred to. In an article by the Rev. W. T. Bree (Mag. Nat. Hist. v. 330) on several British Lepidoptera, there is mentioned a variety of C. Hyale which occurred at Dover,—a whitish one; this being the only description of any variation in the markings or colour of this insect I have met with: and were it usual in the case of a rare insect like C. Hyale, it would hardly have been unnoticed. It appears that by far the greater number of specimens of this insect have been captured on or near the sea-coast; indeed, the Rev. Mr. Bree says,—"C. Hyale appears to be a maritime fly, occurring almost exclusively near the sea-coast:" so that it is not improbable that the very rare specimens which are found in the midland counties, will bear such a different and distinctive character in the markings, as to constitute perhaps a new species,

Colias Hyale, *var.*

or certainly at once to decide an inland specimen from a maritime one. On the 4th of the present month (July) a specimen of C. Hyale was seen and chased from flower to flower for half a mile, in a lane near Shardlow, Leicestershire, by my father, who did not succeed in securing it under his hat, though it allowed him repeatedly to strike at it. It appeared to him to differ in nowise from the specimen mentioned above. On the 13th of July Mr. Harley saw a specimen of C. Hyale flying about the fields near a farm in Shropshire, the colouring of which appeared to him very singular and beautiful. He alighted from his horse to pursue it, but in chasing it the horse took fright, and the insect escaped him, although struck down. He returned the next day, but the insect never made its appearance again. He was able, from the sight he had of it for awhile on the flowers, to notice the colouring and markings well, and describes it as being of a very rich sulphur, with the apical margins and the discoidal spot of the fore wing of a deepish *red* colour. I need hardly add that the capture of this insect would have added to the beauty of this genus of our diurnal Lepidoptera. — *J. Plant; 37, King St., Leicester, July* 21, 1843.

Note on the capture of Colias Hyale. Whilst driving into Canterbury to-day (June 15), I observed a butterfly in a clover-field, which proves to be Colias Hyale. I fortunately captured it in my hat after a short chase, not having my net with me. Another has been seen in the same place, where I also took five specimens last summer, about the beginning of August. — *John B. Harrison; Barham, near Canterbury, July* 15, 1843.

Note on the capture of Heliothis armigera near Salford, (figured in Boisduval). I have great pleasure in announcing this fine addition to British Lepidoptera, a beautiful female specimen having been taken in September, 1840, off the door of an outhouse belonging to my friend Mr. John Thomas, of Oldfield Lane, Salford, who liberally added it to my cabinet. — *Robert S. Edleston; Fearn Acre, Cheetham Hill, near Manchester, July*, 1843.

Note on Saturnia Pavonia-minor and Lasiocampa Rubi. A few days after I sent my last communication (Zool. 199), I was on White Moss, in the afternoon, and a man having a female of Saturnia Pavonia-minor, I remained with him a short time, when, to our great surprise, the males of Lasiocampa Rubi began to fly to the cage, but immediately on alighting on the box, found out their mistake and required to be secured. I never was witness to anything of the sort before.—*Id.*

Note on the variation in colour of Scoliopteryx libatrix. I caught a specimen of Scoliopteryx libatrix on the 13th of March last, in an empty house. Whether it had hybernated in the imago state, as the species of Vanessa generally do, I have no means of ascertaining. It was thoroughly perfect, the scales not being abraded on any part of it. Whilst speaking of this insect I may observe that neither Mr. Duncan (in the 'British Moths, — Naturalists' Library') nor Mr. Westwood (in his volume just published) says anything respecting the varieties of colour to which this species is subject, although the colouring of their plates is very different (at least in the copies I have), Mr. Duncan's being very light and Mr. Westwood's extremely dark. I have two individuals, one of them equalling the lightest and the other the darkest of the plates alluded to above.—*James Bladon; Pont-y-Pool, July* 10, 1843.

Note on the capture of Lithosia muscerda in Norfolk. On the 17th of this month I took several specimens of this rare species in the meadows at Horning, in Norfolk. They made their appearance from half-past 8 till 10 o'clock in the evening, slowly flying over the long grass, and were very easily captured. I think amongst them there

are two females, judging from the size and shape of the abdomen; in other respects they resemble the males. I may add that at the same time and place I caught Acosmetia rufula in tolerable abundance, and a few specimens of Pyralis cribralis.—*Henry F. Farr; Lower Close, Norwich, July* 24, 1843.

Description of a New British Bee. By FREDK. SMITH, Esq.

I HAVE much pleasure in recording in 'The Zoologist' the capture of a new species of the genus Stelis of Panzer,—the Apis punctulatissima and A. phæoptera of Kirby being the only species previously noticed as British. Two specimens of this new species were captured in a garden at Blackwater, in Hampshire, in company with the rare Osmia leucomelana, upon which they are probably parasitical. I have observed the Stelis phæoptera three or four successive seasons, in the month of June, entering the nests of Osmia hirta, in an old post in the Battersea fields; on one occasion I observed a female Osmia busily engaged in excavating her cylindrical burrow; I left her undisturbed, and, on returning to the spot an hour or two afterwards, I saw a female Stelis running about the post, much after the manner in which ichneumons may be observed; at length she stopped at the entrance of the new burrow commenced by the Osmia; she entered, but quickly retreated and flew off. I then inserted a straw, expecting to find the Osmia still engaged at her laborious task, but that was not the case; she had, however, excavated to the depth of about two inches: subsequently the Stelis returned, entered the burrow, and passed in and out three or four times, as if to satisfy herself whether a proper nidus was prepared for her eggs or not. I captured the insect, which proved to be a female. I cannot of course be certain that this was identical with the bee which I first observed.

I have searched diligently amongst foreign collections, as well as through works, but can find neither description nor specimen agreeing with the new species. I therefore propose describing it as new.

Stelis octomaculata (female, length 3 lines). Head black, deeply punctured, face with scattered silvery hairs: thorax black, more coarsely punctured than the head: the tegulæ and nervures of the wings black: wings clouded with a broad dark margin on the outer edge: all the legs black, with short, scattered, silvery hairs, more dense on the coxæ and femora; all the tarsi ferruginous: abdomen black, coarsely punctured above, finely so beneath; the first segment has two ovate cream-coloured spots, placed laterally; the second, third and fourth have oblong streaks of the same colour (acute at the

ends), also lateral, the first streak being the broadest, the other two gradually decreasing in width; the fifth and sixth segments immaculate.

None of the species of the genus Stelis are abundant insects; in fact some seasons I have not taken a specimen: still they appear scattered over the country. Should the new species prove to be the parasite of Osmia leucomelana, the rarity of the latter will in some degree account for its not having hitherto been discovered; but, in fact, the indifference with which this tribe of insects is regarded, is perhaps a better reason: and truly to me it is a matter of wonder that this most interesting order does not absorb the greater portion of the attention of entomologists generally, for when we consider the variety and beauty of their forms, their varied and wonderful instincts, the mechanism displayed in the construction of their nests, the unwearied love and affection for their young, — these, and a thousand other things, combine to render them, in my opinion, the most interesting and attractive order of insects. FREDK. SMITH.

5, High Street, Newington,
July 2, 1843.

Notes on Entomological Captures in Hampshire.

By FREDERICK SMITH, Esq.

I BELIEVE I may say, without being charged with boasting, that I have been an industrious collector for the last ten years, yet never did it fall to my lot, in so short a period as three successive days, to capture such a series of rare insects, as during an excursion of three days in Hampshire. My object was to search for Hymenoptera, and make such observations on their economy as chance might throw in my way. The dates of capture were July 19th, 20th and 21st, and the following is a list of the best insects taken.

Formica sanguinea, all the sexes from the nest.
Myrmosa melanocephala, five of each sex.
Methoca ichneumonides, female.
Pompilus affinis, both sexes.
Miscus campestris, abundant.
Miscophus bicolor, both sexes.
Psen equestris, abundant.
Elampus Panzeri, sixteen specimens.
Epipone lævipes, six ditto.
Osmia atricapilla, four ditto.
Epeolus variegatus, abundant.
Anomala Frischii, the beautiful green variety.
Rhinobatus planus, twenty-one specimens.

Formica sanguinea. What naturalist has not read with delight Huber's wonderful account of this insect, its battles, and the history

of its making captives and slaves* of its less warlike neighbours! Three years ago I discovered some nests of this excavating species in a sandbank on Cove common, in Hampshire, and I have visited them every subsequent summer, but have never been so fortunate as to witness one of their pitched battles; in fact, until the present year I observed nothing peculiar in their habits. On the morning of my arrival I went directly to the nests, and observed that some movement

* "*Slave Ants.*—The most remarkable fact connected with the history of ants, is the propensity possessed by certain species to kidnap the workers of other species, and compel them to labour for the benefit of the community, thus using them completely as slaves; and, as far as we yet know, the kidnappers are red or pale-coloured ants, and the slaves, like the ill-treated natives of Africa, are of a jet black.

"The time for capturing slaves extends over a period of about ten weeks, and never commences until the male and female ants are about emerging from the pupa state, and thus the ruthless marauders never interfere with the continuation of the species: this instinct seems specially provided, for were the slave ants created for no other end than to fill the station of slavery to which they appear to be doomed, still even that office must fail were the attacks to be made on their nests before the winged myriads have departed, or are departing, charged with the duty of continuing their kind.

"When the red ants are about to sally forth on a marauding expedition, they send scouts to ascertain the exact position in which a colony of negroes may be found; these scouts having discovered the object of their search, return to the nest and report their success. Shortly afterwards the army of red ants marches forth, headed by a vanguard, which is perpetually changing; the individuals which constitute it, when they have advanced a little before the main body, halting, falling into the rear, and being replaced by others: this vanguard consists of eight or ten ants only. When they have arrived near the negro colony, they disperse, wandering through the herbage and hunting about, as if aware of the propinquity of the object of their search, yet ignorant of its exact position. At last they discover the settlement, and the foremost of the invaders rushing impetuously to the attack, are met, grappled with, and frequently killed by the negroes on guard: the alarm is quickly communicated to the interior of the nest; the negroes sally forth by thousands, and the red ants rushing to the rescue, a desperate conflict ensues, which, however, always terminates in the defeat of the negroes, who retire to the inmost recesses of their habitation. Now follows the scene of pillage; the red ants, with their powerful mandibles, tear open the sides of the negro ant-hill, and rush into the heart of the citadel. In a few minutes each of the invaders emerges, carrying in its mouth the pupa of a worker negro, which it has obtained in spite of the vigilance and valour of its natural guardians. The red ants return in perfect order to their nest, bearing with them their living burdens. On reaching the nest the pupæ appear to be treated precisely as their own, and the workers, when they emerge, perform the various duties of the community with the greatest energy and apparent good will; they repair the nest, excavate passages, collect food, feed the larvæ, take the pupæ into the sun-shine, and perform every office which the welfare of the colony seems to require; in fact, they conduct themselves entirely as if fulfilling their original destination." — *Newman's 'Familiar Introduction to the Natural History of Insects,' p.* 50.

appeared to be in contemplation, for the bank near the nests swarmed with the larger neuters or warriors, running about in all directions, and assuming at intervals the most menacing attitudes. I watched them about an hour; when the sun was beginning to shine pretty hotly on the bank, they all retreated to the nest; as a general rule very few are abroad during the heat of the day. I visited them again in the evening when the sun was leaving the bank, and observed the same grand muster as in the morning; after this they began to depart, and, following the course taken by the body of the army, composed entirely of the larger neuters, I soon found that their purpose was to pillage. At the distance of about ten yards from their habitation was a nest of the Formica flava, and nearly joining it another of Formica nigra; into both of these the marauders entered, without the slightest opposition on the part of the rightful inhabitants, and quickly reappeared, each carrying either a pupa or a neuter insect, generally the former: on going back to their own nest, I found the laden ants arriving from all quarters with their unresisting captives. In the nest of F. sanguinea I found neuters of both the captured species,—nigra and flava,—principally the former; these indeed are very numerous, and when the nest is disturbed are exceedingly active in carrying the pupæ off to the lower cells. If I visited the spot, either in the heat of the day, or at any time when they were all in the nest, and struck the bank a sharp blow or two with a stick, out rushed the large neuters or warriors alone to the defence, and it was amusing to see the grotesque and ferocious attitudes which they assumed. Nearly all the males and females had taken their departure, and the nests swarmed with eggs and larvæ of neuters, and the captive ants were doubtless intended as nurses to the young brood.

Miscus campestris. This insect is found in company with Ammophila sabulosa, and is equally abundant, and undoubtedly a distinct insect. The females of Miscus are never so large as those of A. sabulosa. Miscus also provisions its nest with caterpillars.

Elampus Panzeri. I took this insect by beating the shrubs when the sun was obscured by a cloud; they then settle on the leaves, but fly very rapidly in the sunshine. I beat six specimens off a small dead twig, on which they had settled; they sparkled like jewels.

Epipone lævipes. I had the good fortune to add this insect to our British Fauna, and Mr. Shuckard described it from my notes in Lou-

don's 'Magazine of Natural History,' but I did not then know with what it provisioned its nest; this year I have made the discovery: it stores up a number of small green caterpillars, which it coils round with the most beautiful regularity, within the excavated bramble stick, placing them alternately right and left.

Osmia atricapilla. The first specimen which I took of this rare little bee, I observed enter a bramble stick which Epipone lævipes had previously excavated; this was three or four years ago. I have never been successful in finding its nest until this season, although I have occasionally taken specimens, all at the same spot, for it is very local as well as rare. I this year observed one excavating a dead bramble stick; this bee I captured, and after diligent search I saw another enter an excavated stick, which I found on examination contained two masses of pollen and honey, and upon each mass was an oblong egg, tapering a little towards either end; it was about a line in length, and quite transparent. I shall make careful notes of the development of the bees, if I am fortunate enough to rear them.

Rhinobatus planus. I took a single specimen in June four years ago, about half a mile from the spot where I captured so many this season. I found the first on the common thistle, which grows on every bank, and in every lane and field. I have visited the same field in which I found it every year since, without success. I now find that it frequents a different species of thistle, in marshy ground: I do not know the name, but the thistle grows as high as five feet, in some instances, a number of stalks springing from the same root; the leaves are merely rudimental on the stalks, not longer than two inches or so, and the stems covered with fine prickles quite clothed with them; the flower is purple; one or two plants had white flowers, but the same stalks and leaves. I generally found them in pairs; I think in no instance more than one pair on a plant, and generally on the smaller plants. I had eight hours of uninterrupted bog-trotting, and only got up to my knees once before I captured the twenty-one specimens. I could not find a specimen on any thistle which did not grow in the marshy ground.

FREDERICK SMITH.

5, High St., Newington Butts,
July, 1843.

Note on the Economy of a Fossorial Hymenopterous Insect. As you invite the communication of facts relative to Natural History, I will give you an anecdote of an insect that came under my notice whilst residing in Staffordshire some years ago; at the

same time hoping that either you or some of your entomological correspondents will help me to the name. It was during the time of corn-harvest that I was one day sitting within doors, near an open window, when in flew what at first, from its bands of black and yellow, and from its general appearance, I took for a wasp. It was laden with a mass of moist clay, which it proceeded to deposit between the open leaves of a book, that chanced to be standing on one end near the window. After some time spent in fixing and forming to his mind, away flew my little architect, soon however to return, but this time laden with a green caterpillar, seemingly as heavy as himself, but quite unresisting and motionless, as if caught and carried off in a profound nap, or awed into submission by terror or rough handling. The victim was stowed away in the same depositary as the clay, by a fresh importation of which he was subsequently closely immured. Another and another green caterpillar in succession shared the same fate, "each in his narrow cell," to the number of somewhere about half-a-dozen. Having to go out to stay a day or two at a friend's, my observations were broken off, not however without requesting that during my absence the window, book, and all, might remain undisturbed. But it is hard to provide against carelessness, curiosity and housewifery (the collector's bane!):—on my return all was found demolished. It may be well to mention that though this was the only season that the fly came under my observation, several other individuals were at the same time similarly engaged in sealing up victims in the crevices of a loosely built wall close at hand.—*W. L. Beynon; Down Hall, near Harlow, June* 28, 1843.

[May not the insect be the mason wasp (*Epipone lævipes*), mentioned in the preceding communication?—*Ed.*]

Notes on the Capture of Claviger foveolatus, and other Coleopterous Insects inhabiting Ants' Nests. By Frederick Smith, Esq.

I shall, in the first place, give a full account of the capture of Claviger. I believe the first specimen taken in this country was found a few years back in a nest of Formica flava, by Mr. John O. Westwood, at Ensham, in Oxfordshire: this solitary capture, together with the time which has since elapsed, and no second specimen turning up, had induced the conclusion that it was one of our rarest insects; but the interesting observations of a foreign naturalist, P. W. J. Müller, have drawn the attention of entomologists generally to this insect.

On the 29th of April last, Mr. E. Doubleday and Mr. Ingall were at Mickleham, on an entomological excursion, and were turning over stones in a field in search of Coleoptera, &c., when on turning over a stone which covered a nest of F. flava, a strange-looking insect was observed on the under side, in company with some of the ants; this proved to be the Claviger (Zool. 200): another was found on the 1st of May, and, although they turned over cartloads of stones in that and some of the adjoining fields, no more could be found at that time; but on Monday, the 19th of June, the spot having been pointed out

to me by my friend Mr. E. Doubleday, I succeeded in taking twenty-two specimens; I should probably not have taken so many had I not, after capturing six or eight, found a pair *in copulâ;* I became anxious to take others, and succeeded in finding three pairs thus connected.

I have been an examiner of ants' nests, and an observer of their habits, some years, and have searched in scores of the nests of Formica flava for the Claviger, and this perhaps is the reason why I have not found it. In the immediate neighbourhood of London there are no stony fields like those in chalky districts like Mickleham, &c., and, where the soil is subject to retaining a greater degree of moisture, like the London clay, the ant appears to find it necessary to raise up a hillock like a mole-hill, to the upper chambers of which she conveys her larvæ, eggs and pupæ, as the atmospheric changes render it necessary; but, on the contrary, at Mickleham I did not observe a single instance of any superstructure being raised, for, in a soil so light as in some places barely to cover the strata of chalk, the ant is glad to find a situation so suited to her purpose as the underside of a large stone, for here the necessary degree of moisture for the development of her progeny is retained in the earth. Now it will be obvious that the difficulty of detecting the Claviger amongst the accumulations of the ant-hill must be very great, but on removing the stones you are at once, as it were, admitted into the channels of the nest, filled with eggs, larvæ and pupæ, and amongst these it is that Claviger is found.

The first question which naturally arises is this—what is the nature of the connexion between the two insects? P. W. J. Müller, in Germar's 'Magazin der Entomologie,' informs us that the ants altogether support the Clavigers, for the sake of a peculiar secretion which exudes from them, and which the ants suck from the two flocks of hair that terminate the external angles of the elytra, — that the ants occasionally caress the Clavigers, who then give out a fresh supply of the fluid,—that the Claviger is wholly dependant for support on the ants, who feed it with juices extracted from flowers, &c.

It is but reasonable to suppose that, as the Claviger is destitute of eyes, it would never of its own accord quit the nest; and I think the mode in which it becomes distributed will be best shown by what I shall relate of my own observations on another parasite or inhabitant of ants' nests. It must not be supposed, from what I have stated, that every nest contains Clavigers; that I am convinced is not the case, even in the neighbourhood where it has been found: nor can

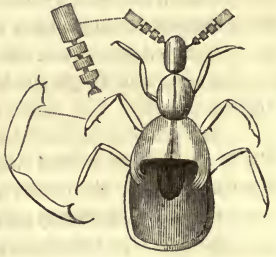
it, therefore, be absolutely necessary to the ants or their economy, any more than a species of Aphis which I found numerous in some nests, while in others I observed a Staphylinus (Astilbus caniculatus, *Dillwyn*); and the first capture which I made in the ants' nests at Mickleham, and supposed to be the Claviger, I found on examination was a species of Euplectus, apparently undescribed: from the two latter insects the ants probably procure no exudation, but they are notorious for obtaining it from the different species of Aphis. — From another insect, the Atemeles acuminatus, *Kirby*, I have no doubt a similar fluid is obtained by more than one species of ant. Some years ago I was watching the proceedings of a colony of the Formica rufa, or wood-ant, and, on scattering a small portion of the nest down a sloping bank, I observed a specimen of Atemeles amongst the ants, running quickly about until seized by one of them; I searched in vain for more; but in the nest of Formica fusca I have frequently found them, and two years ago, whilst attentively watching the proceedings of that species, about the first week in May, just when the young larvæ are found, I observed an ant carrying an Atemeles in its mouth towards the nest; I searched further, and detected twelve or fourteen ants thus employed, and I found them very reluctant to part with their burthens: the Atemeles, like the Claviger, is furnished with tufts of hairs, but they are situated on the lateral margins of the first three or four segments of the abdomen; there are also two processes flocked with hair on the ventral segments; this is perhaps an adaptation to the same purpose, as mentioned by Müller with regard to Claviger: in the Astilbus caniculatus before mentioned the tufts are wanting, still the same end may possibly be attained by another means.

The affection of the ants for these little creatures is very great; for on removing a large stone from a nest of F. flava, full of eggs, larvæ and pupæ, I immediately observed several specimens of Claviger, one pair *in copulâ*, others crawling sluggishly amongst the larvæ, &c., the ants apparently taking no heed of them: I placed one on the turned up stone, on which several ants were running; it was instantly seized, and carried to the nest: I have tried the same experiment with Atemeles with the same result, but I have also seen the Atemeles attempt to escape from the nest, pursued, and taken back; this, from its blindness and sluggish motions, I should expect is never the case with Claviger. I am inclined to the opinion that the only purpose for which these insects are retained by the ants, is for the sake of the fluid which they extract from them; I feel convinced that there are

hundreds of nests without them: they are most numerous during the early summer months, whilst the larvæ are in the nests, and I was at one time inclined, from that circumstance, to think that the fluid extracted from them might serve to nurture particular sexes of ants, but the fact of their not inhabiting every nest at once decides the question.

The figure drawn is that of a male, as shown by the spined intermediate legs; some other minute differences may be observed between the sexes, but not such as can be delineated in a drawing.

(Size, 1 line). Characters—head cylindrical, rather widest in front, eyes apparently wanting; the antennæ six-jointed, the first very minute, second larger than the first, the third fourth and fifth transverse, the third joint cup-shaped, rounded towards the head, the fourth cup-shaped, but reversed, the fifth cup-shaped as the fourth, the sixth elongate, cylindrical: thorax rather elongate, widest towards the head: elytra much wider than the thorax; the posterior external angles, in both sexes, furnished with a flock of curved hairs: abdomen wider than the elytra, much depressed towards the elytra, deeply foveolated in the centre, lateral margins reflexed: the legs are rather stout, each tarsus 3-jointed, but only observable under a high power, terminating with a minute claw. The male has a minute tooth at the base of the intermediate femora, and also one towards the apex of the tibiæ. The abdomen, in both sexes, appears to consist of five segments, united above: the head, thorax and elytra with scattered yellow hairs, sparingly so on the abdomen. The sexes are about equal in size.



Claviger foveolatus.

Note.—The Claviger has been subsequently captured even in greater numbers than by myself, in the same field at Mickleham, by Mr. Samuel Stevens.

FRED. SMITH.

5, High Street, Newington,
July, 1843.

Note on the capture of Coleoptera in Lincolnshire, in June, 1843. I select the following from above a thousand specimens of Coleoptera, captured by me during last June, in the north of Lincolnshire. The whole month, it will be remembered, was most ungenial and discouraging to the entomologist; and it may be well to add, that in Lincolnshire, a succession of cold east winds were blowing without intermission for nearly three weeks, and so unusual was the season, that for several nights together, in the early part of the month, the thermometer was within a few degrees of the freezing point.

Cicindela sylvatica. In great profusion on Manton common, near Brigg, where in one morning I took upwards of fifty specimens.

Lamprias chlorocephalus. Grassy meadows on the banks of the Trent, where, however, it is far from common.

Leistus rufescens. Abundant in damp woods near Gainsborough.

Pterostichus oblongo-punctatus. One specimen in Lee wood.

Nitidula obsoleta. In the greatest profusion in Lee wood, where, on a single fungus, I might have taken several hundred specimens, on the 20th of June, with Engis rufifrons.

Hylesinus scaber. A pair on an ash tree at Spridlington near Lincoln.

Cis Boleti. Gate-Burton wood, not com.

Byrrhus sericeus. Extremely abundant on Scotton and Manby commons, June 23 and 24, where I found it dead on the sand-hills.

Aplotarsus testaceus. Captured twenty-five specimens in a meadow on the banks of the Trent at Knaith, where I might have captured several hundred. It appears to be most abundant in the evening, and is very local. June 17, 19, 20.

Ctenicerus metallicus. With the former insect, but much rarer.

Sericosomus fugax. Swept a single specimen from the fern on Scotton common, June 23.

Campylus linearis. Rather plentiful in Lee and Gate-Burton woods.

Gymnaëtron Veronicæ, Germ. Knaith, rather common.

Hypera arator. Gate-Burton wd. June 21.

Nedyus Chrysanthemi, *assimilis* and *marginatus.* Very abundant in damp meadows on the banks of the Trent, June 17—23.

Apion affine. In the same locality as the above, but far more uncommon.

Barynotus Mercurialis. Apparently a common species throughout the whole district, especially on the sand hills on Manton common nr. Brigg, and in the neighbourhood of Gainsborough.

Philopedon exaratus. With the above; I took it (dead) in profusion on the sand hills, June 24.

Dorytomus vorax. Very plentiful near the site of the old Swann pool, Lincoln, June 6 and 28.

Cleonus nebulosus. A single specimen nr. Scotter, June 23.

Grypidius Equiseti. One specimen from the Swann-pool, Lincoln, June 6.

Tetrops præusta. Took a few specimens off the flowers of the whitethorn, at Spridlington.

Leptura sex-guttata. A single specimen from off a bramble-blossom in Scawby wood, June 24, in which locality I have seen upwards of a dozen specimens captured.

Grammoptera ruficornis. In the utmost profusion throughout the whole northern part of the county.

Cassida sanguinolenta. Brushed a single specimen into my net from off a willow near the banks of the Trent.—This is the only instance of this insect having been taken in this part of Lincolnshire that I have heard of.

Pachyta livida. Very scarce this season, although three years ago I captured it in the greatest profusion throughout the whole neighbourhood, especially near Gainsborough, where I have not taken one this summer.

Luperus rufipes. Abundant at Spridlington, June 7—15.

Notoxus monoceros. Captured a single specimen on Scotton common, June 23.

Chilocorus 4-verrucatus. Not uncommon at Spridlington.

Coccinella hieroglyphica. Took one specimen (flying) on Scotton common, June 23.

Amongst other rarities which have been taken in this locality, although not captured

by myself, I may mention Adimonia Alni, Trypodendron domesticum and Hygrotus Stephensii.—*Vernon Wollaston ; Jesus Coll., Cambridge, July*, 1843.

Note on a species of Aleochara. One of the species of Aleochara, I believe Al. Cursor, is very common on the beach near Penzance, under sea-weed. It has a peculiar method of doubling itself up when alarmed, by turning the end of the abdomen upwards and the head and thorax downwards under the body; when in this position, it so much resembles a fragment of the weed, that I should not have detected it had I not seen the process of transformation.—*Frederick Holme ; C.C.C. Oxford, July*, 1843.

Note on Chrysomela Banksii. This insect occurred in the greatest profusion near Penzance at the end of May and during June. I have often found them sticking on the underside of timber lying on the wet sea-beach. They appear to be much preyed on by the blind worm (*Anguis fragilis*), which abounds in the West of Cornwall.—*Id.*

Note on Cicindela campestris. When several of these insects are confined together they fight savagely, rearing up against one another like dogs. I have known one decapitate its antagonist with a single stroke of its jaws.—*Id.*

Note on Broscus cephalotes. These insects occur in great abundance in holes on the beach near Penzance. When confined in a box or bottle with other insects, they appear to prey on their own species by preference, contrary to the habit of almost every other predaceous insect; even the opposite sexes will attack each other, as I have often witnessed.—*Id.*

Note on Phyllopertha Horticola. This insect is found in Cornwall during the summer in almost incredible numbers. I have seen them in a garden at Tregembo, near Helston, the seat of Wm. Pascoe, Esq., and I think every flower in the garden contained three or four; the rose in particular appeared to attract them. A few days afterwards I saw them literally covering the eastern side of the cliff, at St. Michael's Mount, feeding on the borage growing there. They vary considerably in colour, some having the thorax green, others deep blackish blue; in some the suture is greenish, and some are of a very deep suffused tinge throughout.—*Id.*

Note on the species of Cionus and Sphærula Lythri. These insects are not uncommon near Penzance. Cionus Scrophulariæ, Verbasci and Blattariæ appeared particularly partial to the balm-leaved figwort (*Scrophularia Scorodonia*) behind Mr. Bolitho's house at Chyandown, about a mile from Penzance. At first sight they greatly resemble the excrement of birds; and they fall motionless to the ground when approached. Like most of the Rhyncophora they run up a perpendicular surface of glass with great facility. They fly readily and well when the sun shines. I found Sphærula Lythri in plenty in July, on Osmunda regalis and other ferns, growing on the rocks between Newlyn and Mousehole: like the species of Cionus, it falls motionless when touched. —*Id.*

Note on Molytes anglicanus. This insect is very common in the summer near Penzance, particularly on the hart's-tongue fern (*Scolopendrium vulgare*). Its wing-cases are so hard as not easily to be pierced with a pin: and as the insect, when touched, extends its limbs and remains motionless, it must be almost too rough a morsel for the bill of an insectivorous bird. Mr. Griffin tells me that he saw a trout which had snapped one from the surface of a shallow stream, rubbing his head against the bottom in evident discomfiture, as if the insect were sticking in his gills by means of its extended limbs.—*Id.*

Note on the capture of Pissodes Pini near London. This northern insect has twice occurred recently with us. My friend Mr. Bush found a specimen the other day crawl-

ing up an old wall at Paddington; and another was taken last year at Kensington: the former I had the pleasure of examining whilst alive. It is possible they may have emerged from some old fir-stump, but I should think it more probable they were introduced in timber from Scotland or Norway. — *Samuel Stevens; King St., Covent Garden, July* 25, 1843.

Note on the capture of Rhinomacer attelaboides near Edinburgh. I captured a pair of this rare insect in Dalmeny Park on the 20th of June, while sweeping the grass under fir-trees. A few specimens of Sphæriestes immaculatus have also occurred in the same locality.—*R. Northmore Greville; Queensferry, near Edinburgh, June* 28, 1843.

Note on the blighted appearance of the Oak and Ash Trees in Yorkshire. In this part of the country, the North Riding of Yorkshire, the oak and ash trees have a singular blighted appearance, to an extent which I never before observed. The younger trees, particularly the ashes, have escaped, generally speaking, and look well, but the majority of the larger grown ones have the blasted appearance I have alluded to above. A great many dead branches appear in most, which seem as though they had been struck by lightning, and comparatively few of these trees have the appearance of being in full leaf. For a long time I thought them only backward, and attributed it to the continued heavy rains and want of sun; but whether this was the cause of their present state, I am at a loss to know.—*F. O. Morris; Crambe Vicarage, near York, July* 7, 1843.

Notes on Ephemeræ. By The Rev. J. C. Atkinson, B.A.

"While enjoying the hospitalities of Culhorn, they visited the Loch of Soul-seat (*Sedes animarum*), remarkable for the myriads of an ephemeral fly, the *Eph. albipennis*, which forms clouds and pillars, rising to the height of above fifty feet, and darkening the air like a mass of vapor or smoke. Previous to their transformation into their strictly ephemeral state of winged insects, they are said to live in their subaqueous abodes for two or three years in the condition of *larvæ;* but the most singular peculiarity of the species is, that they 'throw off a slender envelope or skin, including even that of the limbs, eyes, *setæ* and *antennæ;*' and the angler, after remaining only a short time in this entomological mob, is completely covered with the filmy skins of these gay Ephemeræ."— *Article on Wilson's 'Voyage round Scotland and the Isles,' in 'Edinburgh Review,' for Feb.* 1843, p. 174.

On reading this paragraph I was immediately reminded of a scene I witnessed a few weeks since, on the banks of the river Whitadder. I was so much interested by what I had seen, that I noted down the chief particulars while the remembrance was still quite fresh; and I now give the substance of my notes, in the belief that they will not be devoid of interest to the readers of 'The Zoologist.' I will only add that I have had no opportunity of identifying the insect whose changes I noticed, nor yet of examining Mr. Wilson's book for a description of Eph. albipennis.

June 15th, 1843. By the Whitadder. Immense clouds of small,

very light blue—almost milk-coloured—Ephemeræ rose into the air. There were several flights or *clouds* at intervals through the evening, and they seemed to grow continually more and more dense. I am conscious that description must fail to convey an idea of the prodigious numbers of individual insects, of which the several 'clouds' were composed. I may perhaps succeed in giving some notion of the dimensions of the later flights, by stating that they extended *upwards* as far as the eye could reach, in *breadth* from side to side of the river —not less that twenty yards; and were from one and a half to two or more minutes in passing me, as they moved slowly along in the direction of the stream. And so dense were these flights, that vision was interfered with; you could not clearly distinguish an object on the further bank of the river.

I first noticed them between 7 and 8 o'clock. They were numerous, but not more so than some other species which are often seen in the evening. At this time they were dispersed in all directions: the large clouds had not begun to appear; and when they did, it made no diminution in the number of stragglers, which, in fact, continued to increase as long as I remained by the river,—until nearly 10.

My attention was first particularly drawn to them by their settling on various parts of my dress; and about 8 o'clock there must have been hundreds on my hat, coat and waistcoat. In the course of a short time, on casting another glance at my spotted sleeve, I observed, in addition to the insects themselves, which were quite as numerous as before, a quantity of exuviæ or skins adhering to the cloth. This led me to watch them closely: and it was quickly apparent that their object in settling was to find a resting-place during the time about to be occupied in divesting themselves of an external skin or envelope.

Soon after an insect had alighted, the tail was somewhat elevated, the whisks or setæ made to diverge to their full extent, and the end of the body energetically moved from side to side for the space of a minute or two. Simultaneously with this motion the fly continued to move backwards, apparently endeavouring to fasten its feet firmly to the cloth, so as to remain fixed during the approaching change. When the motion of the tail ceased, the whisks lost their divergency, and the insect remained motionless for a few seconds.

Up to this time the wings had been in a horizontal position,—expanded, as a butterfly's are sometimes seen, when it is resting on a flower, or on the ground: but now they began to be first elevated a little, and then depressed as much as possible. This was just the kind of action a man, who wished to burst his coat on his back, would use;

and it seemed to be done for that very purpose. At all events, it had that effect; for after it had been twice or thrice repeated, it produced a small longitudinal slit in the skin of the back of the fly.

The slit, once produced, was speedily enlarged by continuing the motion of the wings; and the glossy chesnut back, beneath the external coat of a dull light brown colour, began to appear. The head was now much depressed, and the back curved and elevated in an equal degree; the motion of the wings ceasing at the same instant. The next part of the process seemed to be effected without difficulty or exertion. The slit extended, and the body of the insect, beginning with the highest part of the back between the wings, steadily emerged. The wings themselves, still in their horizontal position, were gradually drawn back, so that their anterior edges formed a continually decreasing angle with the sides, and at last became parallel with them. At this instant the head was freed, and raised aloft. Convulsive motions of the body and tail ensued, and presently, wings and legs were all released at once.

But there yet remained to be performed what seemed to be the most fatiguing and troublesome part of the operation, namely, the extrication and *elongation* of the whisks. Not one of these little Ephemeræ, previously to throwing off its envelope, had whisks exceeding $\frac{1}{8}$ of an inch in length; $\frac{1}{12}$, I should think, was about the length of those of the majority. But after they had cast their skin, their whisks generally had been so much elongated as to measure $\frac{1}{2}$ an inch in length; and some even $\frac{5}{8}$: those of a very few retained their pristine dimensions. As I have said, this part of the process was apparently more difficult than that which had preceded it. It was certainly more tedious; for in most cases it took up three or four times as much time, and frequently, even more than that: and in not a few instances, it was not completed at all, for the insect took flight with the husk still attached to its setæ.

It was while the Ephemera was striving to extricate its whisks that the benefit of having firmly fixed its feet to the substance which supported it (as above noticed) became apparent. All the force which the little fly could use seemed brought into requisition. The whisks were as unwilling to leave their sheaths, as an eel, in the hands of an unpractised person, its skin. Their perfect extrication, therefore, depended upon the skin of the feet retaining its hold: when it yielded, the exuviæ still adhered, and the flight of the insect was necessarily much impeded; for they all, without exception, took flight almost as soon as the operation was over. From the first appearance of the slit

until the complete extrication was concluded, a space of from one and a half to two minutes elapsed.

There is literally but little exaggeration in the concluding sentence of the quotation from 'the Edinburgh.' If not "*covered*" with the "filmy skins of the gay Ephemeræ," I had at least several scores, if not hundreds, attached to me; many of them so firmly, that they still hung on when I reached home, having walked a mile, and part of the way through a plantation.

June 16.—I was by the Whitadder. There were clouds of the same insect, but not so dense as on the previous evening.

June 17.—By the Tweed. Not one to be seen.

June 18.—By the Whitadder; but not out so late. Two or three only. And on dates subsequent to this, a few seen occasionally.

J. C. Atkinson.

Hulton, Berwick-on-Tweed,
July 1, 1843.

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*Note on the occurrence of Echinodermata in Northumberland.**

Comatula rosacea. I obtained one specimen in the summer of 1841, from deep water in Embleton bay: it is, as far as I know, the only specimen obtained on the east coast, and is now in my possession.

Ophiura texturata. Frequent.

——— *albida.* Not uncommon.

Ophiocoma neglecta. Rare.

——— *granulata.* Common.

——— *bellis.* Ditto.

——— *Goodsiri.* A specimen of this species I extracted from a mass of corallines and stones from deep water in Embleton bay, in 1842; it adhered to the lines employed in deep-sea fishing for ling, halibut &c.

——— *rosula.* Common.

Uraster rubens. Common.

——— *violacea.* Less common.

Cribella oculata. Common.

Solaster endica. Common.

——— *papposa.* Common.

Goniaster equestris. I obtained a beautiful specimen last summer, which is now in my possession; it was taken in the bay, about eight miles south of Embleton. It answers so completely, both as to size and markings, to the description in Mr. Forbes's beautiful work, that any one would believe it had been taken from my specimen.

Asterias aurantiaca. Common.

Luidia fragillissima. Rare.

Echinus sphæra. Very common.

Echinocyamus pusillus. Frequent.

Spatangus purpureus. Very rare on this coast, the only specimen I have seen being the one now in my possession, and obtained last year.

Amphidotus cordatus. Very plentiful.

—*Robert Embleton; Embleton, February* 27, 1843.

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* Communicated by Professor Edward Forbes.

Notes on the nature of the Axis of the Gorgonia verrucosa.

By R. Q. Couch, Esq., M.R.C.S.L.

Whatever opinion is entertained regarding the polypidoms of the hydroid, helianthoid, and molluscan zoophytes, no doubt seems to exist among authors but that the stony and horny axes of the asteroid are inorganic. Lamarck, as quoted by Dr. Johnston, says distinctly that they are inorganic, containing neither vessels nor the least portion of the body of the polypes, but formed of matter excreted by them, and afterwards thickened, solidified and cleared by affinity; and to this Dr. Johnston in some measure subscribes. Ellis appears to have entertained an opposite opinion, which he has supported by facts and observations on different species. As the Gorgoniæ are the only species of this order found on the Cornish coasts, with polypidoms, the following observations will be confined to them, or rather to the Gorgonia verrucosa, which is very common, and has afforded an extensive means of observation.

The hard part, or polypidom, of this order, has a new and remarkable position when compared with all the others; instead of being external and affording both support and shelter to the polypes, it is internal and not immediately connected with them. In many species it is stony, while in others it is horny. In the Gorgonia verrucosa it is horny, solid, fibrous, and extends from the roots to the terminations of all the branches; it is elastic, of a dark brown or black colour, is sometimes smooth and polished, and at others longitudinally striated, and is traversed by a central white pith.

The longitudinal rugæ are sometimes present, and at others absent, circumstances which do not depend much on the season of the year, but rather on some peculiarities of growth.

The axis is covered with two membranes, one proper to the fleshy bark, the other to the axis; but they are not at all times equally well marked. The membrane of the bark lies in close contact with that of the axis: this membrane is fibrous, longitudinally striated, and perforated with numerous oval openings; these, on one side, communicate with the cells of the polypes by means of the canals of the bark; on the other, with similar openings in the membrane of the axis. If this membrane be suffered to undergo partial decomposition its texture becomes separated into cellular-looking bodies, very similar to what Ellis has figured in his 'Essay on Corallines,' pl. 38, A 3, as belonging to the Gorgonia placomus. They however slightly differ, as they probably do in each species. In the Gorgonia verrucosa

they are long, slender, and terminate at each end in a sharpened point, at the base of which is a prominent rim; the terminations thus resemble the pointed stopper and neck of a decanter. Between the extremities the body is straight; but there are on different parts minute cells, sometimes arranged in pairs, sometimes in circles, and occasionally in a spiral manner. If still further decomposed, these bodies become reduced in size, and altered in shape, so as to resemble minute Florence flasks, and finally become resolved into minute globular cells, which constitute the ultimate structure of the membrane. The union of these cells is of the most intimate kind, for with the most powerful and varied lights their points of union could not be detected, till they had become partially decomposed. The dark and light lines with which the membrane is striated, are formed by the more close or loose aggregation of these bodies, as was proved in their decomposition.

The membrane of the axis it is not always easy to demonstrate; sometimes it is very clearly to be seen, and so loosely attached that it may be torn off, either with a knife or by the fingers; at others, so firmly attached and obscure, that its existence would be denied but for its occasional well-marked presence. When the rugæ are well marked the membrane is easily observed; when the axis is polished it is very obscure, and is more or less marked, as one or the other preponderates. When the rugæ are well marked, they appear to be formed of hollow tubes, which communicate with the tubes of the fleshy bark. These tubes can never be seen to advantage, and frequently cannot be seen at all, unless the specimen be examined in a living state. This membrane is also fibrous, and rends freely in a longitudinal direction. It is longitudinally striated with light and dark lines, as is also observed in the membrane of the bark. The resemblance between these membranes is very great; both are longitudinally striped, both have oval openings, and both have the same ultimate structure. The structure, however, of the membrane of the axis, from its being so firm and horny, is not so clearly to be noticed as of the membrane of the crust. When it is but loosely attached it is observable under the microscope, but it becomes more obscure as its attachment becomes firmer, and when the axis is polished it is not observable at all.

At certain periods, which seem favourable to the growth of this species, when it rapidly increases in size and height, the branches, especially the youngest, are very frequently disfigured with large globular protuberances. These excrescences are to be found at all sea-

sons of the year, but appear most abundantly about September, October and November. Ellis has figured similar excrescences on the G. Abietina, Pl. 16 in his 'History of Zoophytes.' These protuberances, on dissection, prove to be hollow, and to be partly filled with a white granular substance. They are composed of — first, the external fleshy bark, with its membrane; next, the membrane of the axis, which is raised, and in contact with the bark; then the white granular matter and the denuded axis.

The next part to be considered is the axis or skeleton, which is the frame-work that gives shape and consistence to the whole. It is horny, solid, elastic and fibrous, and has its centre occupied by a white pith, which extends to all the branches. It varies in size according to the age of the specimen, but is considerably influenced by the situation in which it grows, being more slender and irregular the nearer it approaches the shore, and the older portions are more solid than the younger. This increase in the size of the axis depends rather on the integrity of the fleshy bark, than on any action in the part itself, for if, from accident or the incrustation of corallines, the bark be rubbed off, the axis ceases to increase as far as the denudation extends, while all above and below increases as before. The axis, in a transverse section, will be found to be composed of concentric layers, marked by lighter and darker lines, similar to what is observed in the same section of an exogenous stem. The axis of the Gorgonia, however, differs from wood in several important particulars, having neither the radiating medullary rays, nor the cellular structure, which renders wood so beautiful an object under the microscope.

In a longitudinal section, the concentric layers are as apparent as in the transverse. It is longitudinally fibrous, and rends very freely in that direction. In this section, in different parts of the substance of the axis, patches of grey matter are frequently to be found; most commonly on the lower portions of the trunk, and in the axillæ of branches, especially when two rise close to each other. In the bend of the branches it is very common to observe several layers of it formed in regular succession, separated by thin portions of the axis, and in a specimen before me there are five such strata, alternating with the dark fibres of the axis. This appears to be the substance supposed by Ellis to be the remains of a portion of the fleshy bark, which had been enclosed between the horny layers by previous denudation and regrowth. He says, "we frequently meet with layers of calcareous matter enclosed between circles, which is evidently nothing else but the decayed flesh of the animal, which has been covered and

enclosed by the subsequent growth of the same animal." This does not appear to be the true explanation. In the case of the globular protuberances mentioned before, it is formed by, or beneath, the investing membrane of the axis, while the fleshy bark remains entire; and the repetition of these spots in the bend of the branches precludes the idea of such a fortuitous enclosure. The opinion of Ellis appears, therefore, to be erroneous, but is rather an error of deduction than of observation. Near the root the axis is frequently studded with small cavities, some of which are empty, while others are more or less filled with this greyish matter; the most inferior are generally empty, while in the more recent it is more or less abundant. From the gradation of quantity observed in these cavities, it seems reasonable to suppose that each had formerly been occupied by this grey matter, which, in some way or other, had been since removed. There appear to be only two methods in which such a removal could occur; either from degeneration or absorption. It is exceedingly rare to observe any marks of degeneration, either in the form of powder or a disorganized appearance of the substance itself, and therefore it seems most probable that its removal depends upon absorption.

The pith is white, and runs through the centre of the trunk and branches, and is smaller in the lower and older than in the upper and newer portions. In a transverse section of recently formed parts, it is found to be composed of irregular-sized cells, quincuncially arranged; in a longitudinal section, to be formed of cells similar in shape to those observed in the fleshy bark, but smaller in size. In the older portions of the pith this cellular structure cannot be observed. From the pith being smaller in the older than in the younger parts, the cells are most probably obliterated by pressure, either becoming ruptured, or so closely compacted that their ultimate structure cannot be detected, even by maceration. This pith differs in several important particulars from the pith of vegetables. In vegetables it is continuous from the trunk through all the branches; in the Gorgonia verrucosa it is divided into numerous small compartments by transverse horny septa, and the pith of the branches is separated from the pith of the trunk by several layers of the fibres of the axis, in such a manner as to have no immediate communication with each other. This has been noticed and figured by Ellis and others. The pith of vegetables is also surrounded by ducts and tracheæ, which I have never detected in the Gorgonia; hence there are several important discrepancies between them.

The pith acts an important part in the formation of new branches,

being the first part formed. Branches are formed indiscriminately on all parts of the axis, but most abundantly on the newest. Their mode of formation can be best observed in a longitudinal section. The results of numerous such sections are, that the first visible part formed is a white speck near the centre of the axis, separated from the pith by the interposition of several layers of the axis. This speck is at first very small, but it soon increases in size, and becomes triangular, having its base towards the pith, and apex towards the circumference of the axis. The apex, at first, is removed from the circumference of the trunk or branch by full two-thirds of its semi-diameter, but as it increases in size the intervening layers gradually disappear. At length the apex of the pith reaches the circumference, and the investing membrane, with the surface of the axis, becomes elevated into a small sharply-pointed eminence. This forms the first external appearance of a branch, and is observable only when the bark is taken off; having once become prominent, it increases and grows like the older branches. How the first nucleus is formed I have never been able to determine, but it seems most probable from a process going on in the axis itself; it certainly has no connexion with the presence of the grey enclosed matter mentioned above. This nucleus for the branches very closely resembles the pith, both in consistence and whiteness, while the other matter has a yellowish tinge. In a longitudinal section of seventeen specimens, the pith of all the branches bore the same relative situation to the pith of the trunk, and the triangular pith of such branches as had just reached the surface was exactly the same: it is not at all difficult to trace this pith from the branch to the mere speck. The rudimentary pith can therefore be readily distinguished from the other grey matter, first by its situation, then by its colour and shape, and, in addition to these, it may be noticed that the layers of the axis are always closely in contact with the young pith, while with the grey matter there is generally a vacancy between it and the surrounding axis. The axis thus seems to have an action going on within itself, entirely inconsistent with an inorganic character.

The specimens of this species which grow off our headlands, and in situations where they are liable to be disturbed with a variety of currents, become very bushy and irregular in their growth. Their branches, which are long and cross each other, frequently get denuded of a portion of their bark, and most probably by friction. When this occurs, the branches, at their points of crossing, become firmly united to each other, and, in some cases, for half an inch in extent. On

examination, it is seen that the union does not exist merely between the surfaces of the bark, or between the edges of the axis, but throughout the opposing surfaces. In some cases the union takes place immediately the surfaces of the axis come in contact, but in others the horny branches have been worn half through, and then united; and in a case now before me one branch has become intertwined with several others, and united to them in four distinct places, and one point of adhesion is half an inch in extent. From these considerations it appears that Lamarck's theoretical opinions are inconsistent with facts; and though Dr. G. Johnston has given them his support, yet I have no doubt he will, on re-examination, find sufficient reasons to modify his present opinions, and support the vitality even of the axis of the Gorgonia. The evidence of such being the case is accumulative; but the mode in which the branches are formed, in the old as well as the new parts, and the adhesion or union of the axis of different branches, by what Hunter would call the first intention, are circumstances sufficiently decisive in themselves.

R. Q. Couch.

Polperro, July, 1843.

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*Notice of Fossil Sloths.**

Mylodon robustus, *Owen.*

* Description of the Skeleton of an Extinct Gigantic Sloth, with Observations on the Osteology, Natural Affinities and probable Habits of the Megatherioid Quadrupeds in general. By Richard Owen, F.R.S., &c. London: Van Voorst. 1842.

When the prince of our "out-door naturalists" was wandering in the primæval forests of Demerara; when he watched the *nimble* sloth (strange antithesis!) wending its way along the forest boughs in full enjoyment of life and liberty; when he afterwards penned that beautiful history, in which the sloth is shown to be admirably constructed for its requirings, and in which the Almighty is redeemed from the wicked charge of having created a being for a life of unmitigated misery; when he was thus letting in a flood of light on Zoology from his truthful comments on the living, evidence was day by day accumulating of the former existence of creatures whose frames were constructed on the model of the sloth's, but whose ponderous bulk must have equalled that of the Hippopotamus, and whose Herculean strength must have thrown that of the elephant or even Mastodon into eclipse. What Waterton has done for the living, Owen has performed for the dead; and although we cannot give that unqualified assent to deductions from the admeasurement of bones which we cheerfully yield to the history of living nature, yet we regard Owen's masterly analysis as almost enforcing the views which he advocates with such consummate ability; indeed we cannot but infer from its pages that the sloths of to-day, are the pigmy representatives of a vast tribe of gigantic beings now utterly extinct.

In the 'Ossemens Fossiles'* the illustrious Cuvier has given us a detailed account of the structure of two of these extraordinary animals; and, notwithstanding their vast discrepancy in size, the scientific world at once adopted his view, that they belonged to the same natural order as the existing sloths. In 1838, the Society of Sciences at Copenhagen, printed a most able communication from Dr. Lund, entitled 'A View of the Fauna of Brazil previous to the last Geological Revolution;' and an excellent translation of this paper by the Rev. W. Bilton, appeared in several successive numbers of Mr. Charlesworth's 'Magazine of Natural History.' In the course of his observations, Dr. Lund enters very fully on the structure of these extinct giants, and adduces views respecting them which are replete with interest. How far the genera named by Dr. Lund are identical with those of Professor Owen, we are incompetent to decide; but we could have wished that a more direct communication had taken place between these authors; by this means all risk of a confused synonymy — the bane of science—might have been avoided: as it is fairness compels us to admit the great probability that several of the genera—there are

* Ossemens Fossiles, tome v. part i. p. 174.

no less than six — enumerated in Professor Owen's list may prove to be synonymous, and thus a new field of scientific research may become obscure at the very threshold of the enquiry.

In the history of every land there is a point at which the real merges in the ideal — at which fact is lost in fiction; and it is thus in the history of animals. That of the sloth commences with the publication of Waterton's 'Wanderings in South America;' all before that date is fable, or mixed with fable, all after it is fact; and the contrast is not greater between the humming-bird and the tortoise, than between the sloth of *fact* and the sloth of *fiction*. The history is familiar to every naturalist, or we should quote it. Let us turn to Dr. Lund's account of the living sloth.

"Inasmuch as the mechanism of the sloth's movements, so far as I am aware, is not very well known, I may take the liberty of recording the observations I made on the three-toed sloth (*Bradypus torquatus*) which I kept in my house for a considerable time. This animal climbs with remarkable sureness and aptitude, although, as is well known, with a degree of slowness which, however, may be called rapidity in comparison with its terrestrial movements. The manner in which it moves is this: — Lying on its belly, with all its four extremities stretched out from its body, it first presses one of its hind feet with all its might against the ground, whereby the corresponding side of the body is a little raised. The fore-leg on the same side thus becomes sufficiently free for the animal to advance it a trifle forward. It then hooks its powerful claws fast in the earth, and so drags its body a little onwards. The same manœuvre is next repeated on the opposite side; and thus the poor creature progresses in the slowest and most laborious manner possible. But this mode of progression requires certain conditions of the surface; for if it is not soft enough to admit the insertion of the claws, or if there are no inequalities for them to hold by, the sloth is completely deprived of the power of changing its position. For instance, when I laid it on a table of polished mahogany, it could not advance the least, notwithstanding all its exertions. But in proportion as the sloth's organization unfits it for terrestrial progression, is it wonderfully adapted to climbing trees. With its long arms it reaches high up, and clings fast to the branches with its strong crooked claws. The *inverted* position of the soles of its hind feet, gives it a power of *grasping* the trunk of the tree which no other mammal possesses. So that truly, when we see it climbing a tree, we can scarcely believe it to be the same animal that lies so helpless on the ground. Hence we see, that the sloth's organization is entirely adapted for living in trees. Compared with the slowness of its motions, it is the best climber among mammals, while it is the worst walker; or rather, it is the only mammal that can neither walk nor stand. These peculiarities depend on three principal points in its organization: — 1st, the great length of its anterior extremities, in comparison with its posterior; 2dly, its powerful crooked claws; and 3dly, the *irregular position* of its hind feet."—*Lund in Mag. Nat. Hist. New Series*, iv. 158.

In this account there is much that is excellent, but we doubt whether the Doctor ever saw a sloth climbing a tree, except in imagination, or he would never have omitted to notice that it ran *below* instead of *above* the boughs, and thus effectually counteracted what he terms

"the inverted position of the soles of his hind feet." Dr. Lund, however, saw enough in the living sloth to lead him to very decided conclusions respecting the extinct Megalonyx; differing however, as they do, from those of Professor Owen, we presume not to speak of them as conclusive.

"Now, the Megalonyx, like the sloth, is provided with powerful clavicles; like it, also, its anterior extremities are longer than the hind; its toes are armed with immense claws; and lastly, the sole of its hind foot is turned inwards instead of downwards.

"The first of these characters, or the existence of perfect clavicles, proves that this animal used its fore extremities for more purposes than for walking; which position I take to be incontrovertible, as it is founded on a rule that has no exception among mammals. The purposes for which mammals, provided with clavicles, employ their anterior extremities, are the following: — 1st, for flying, as in the bats, with which we have here nothing to do; 2dly, for the apprehension of food, and the bringing it to the mouth, either with one hand, as in the apes, or with two, like most rodents, some marsupials, &c. Now, the first of these purposes requires a peculiar disposition of the fingers, and a certain freedom of motion in them; which conditions are both wanting in the Megalonyx, notwithstanding this animal, as well as the Megatherium, has in reality been classed by Wagler among apes. The second purpose is confined to animals that have short *fore-limbs*, and whose dental system is adapted to gnaw substances which they hold in their paws; which conditions being also inapplicable to the Megalonyx, there can be no occasion to dwell longer on them. Thirdly, for tearing asunder their prey, as in the feline tribes. This purpose requires only an imperfect development of the clavicles, but at the same time, a peculiar arrangement in the shape and attachment of the claws; which, again, is not the case in the Megalonyx. Besides, the dental system proves it to have been graminivorous; although authors have not been wanting (as Jefferson and Faujas) who have placed it among the Carnivora.

"There remain, therefore, only two functions that are exercised by animals provided with bones for the attachment of claws; viz., digging and climbing. And it is the more necessary to confine our attention to these two points, inasmuch as we see that all animals belonging to the same order as Megalonyx, exercise one or the other of these functions. Their immediate instruments for these purposes are claws, which consequently are powerfully developed in all; but in none in so high degree as in the extinct genera Megalonyx and Megatherium: in these they have reached the highest degree of development we yet know in the animal kingdom. It would be contrary to all experience in Natural History, to suppose that an organ should lose its function and significance precisely at the point where it is most perfectly developed. We cannot doubt, therefore, that the powerful claws with which we find Megalonyx and Megatherium armed, have had their use. We may even conclude with certainty, that the habits of the animals were closely connected with these organs, and that their very existence depended on them. Now, as we only know of two uses for strong claws in mammals, digging and climbing; and as these two purposes require different anatomical arrangements; it will not be very difficult to decide for which of them the powerful organs in the extraordinary creatures we are considering were intended. We find among the animals the most perfectly organized with respect to burrowing, such as the mole &c., that the claws are strong, long, broad, and nearly of equal size, that all the digits are provided with similar claws, and are extended in almost the same plane

as the hand, which is of considerable breadth. Next to moles, the best diggers or burrowers are found in the order to which Megalonyx belongs, especially in the armadillo family; but the different species of that genus are not all equally well provided in this respect. The best diggers are the cabassous, among which we again recognize the same characters as in the moles; a broad hand, all the digits provided with claws, very broad and nearly equal. In the Euphractus the hand is somewhat smaller, as are also the claws, although their number remains undiminished; consequently, the species of this family cannot compete with the former as burrowers. In the true armadilloes the number of digits provided with claws is reduced to four; and they are so inferior to the first described, in the faculty of digging, as to avail themselves, for the most part, of the burrows the others have excavated."—*Lund*, l. c. p. 159.

Dr. Lund then compares the hand of the sloth with that of the Megalonyx, showing that the latter is adapted for climbing rather than burrowing. He describes the hand of the anteaters, showing how well it is adapted for its employ of tearing open the hills of the white ants: he maintains that these animals do not burrow, and hence concludes that the resemblance of the hand of Megalonyx to that of the anteaters, by no means goes to prove, as suggested by Cuvier, that it was a burrowing animal. He next considers the enormous strength of the hinder extremities, the prodigious claw of the middle toe, and the unusually powerful tail (which he supposes to have been prehensile) of the extinct animal; and maintains that all these conditions indicate the power of climbing. It seems however to strike the author that creatures of such enormous bulk were scarcely fitted for the trees of the present day, even as we see them, and in the stately forests of Brazil; and he therefore concludes by clothing this region of monsters with a vegetation proportionably gigantic.

"In truth, what ideas must we form of a scale of creation, where, instead of our squirrels, creatures of the size and bulk of the Rhinoceros and Hippopotamus climbed up trees! It is very certain that the forests in which these huge monsters gambolled, could not be such as now clothe the Brazilian mountains; but it will be remembered, that in the former communication which I had the honour of submitting to the Society, I endeavoured to show that the trees we now see in this region, are but the dwarfish descendants of those loftier and nobler forests which originally clothed these highlands; and we may surely be permitted to suppose that the vegetation of that primæval age was on a no less gigantic scale than the animal creation.

"In the present order of existing nature, all the mammals that are appointed to live in trees belong to the smaller kinds; which seems so essential a condition, that in the families and genera containing climbers, the development of this faculty diminishes in a ratio corresponding to the increase in size of the species. Thus, in the genus Felis, the smaller species live for the most part in trees; those of an intermediate size hunt their prey on the ground, but climb with more or less activity; while the largest species of all are entirely deprived of that power. Again, in the family of apes, the existence of the smaller kinds is indissolubly linked with arboreal habits; while the

larger frequently descend, and pass a considerable portion of their lives on the ground. So, also, in the ant-bears, the smallest species of all lives entirely in trees; those of middle size feed principally on the ground, but also ascend trees; while the very largest have the ground assigned them for their perpetual abode. It therefore very reasonably excites our astonishment, to find that in a former period of creation, such enormous monsters should have had trees allotted them for their habitat."—*Id.* l. c. p. 210.

But it is time that we turn to Professor Owen's dissertation, which is certainly the most complete analysis of a fossil skeleton that it has ever been our good fortune to peruse. First, we have the history of the fossil.

"The skeleton which is the subject of the present memoir, was discovered in the year 1841 by M. Pedro de Angelis, seven leagues north of the city of Buenos Ayres, in the fluviatile deposits constituting the extensive plain intersected by the great Rio Plata and its tributaries, and which has been raised during a recent geological epoch above the level of the sea.

"In this formation, and most probably anterior to its elevation, the animal must have been buried entire; and, if the present heat of the climate prevailed, soon after its death: for the parts of the skeleton were found little disturbed, and the very few bones that are wanting are such as would be likely to escape the search of the most diligent collector.

"About the same time, and near the same place, a tesselated osseous carapace of some large quadruped, like an armadillo, was exhumed; and information of this discovery having been communicated to the Royal College of Surgeons by Sir Woodbine Parish, late H.M. Chargé d'Affaires at Buenos Ayres, both this carapace and the above mentioned skeleton were purchased by the College. They arrived in November 1841, in many pieces, fragile from the loss of the animal matter; but after having been restored in some measure to their original tenacity, the parts of the carapace were reunited, the skeleton was articulated, and both are now placed in the Museum."—*Prof. Owen's Memoir*, p. 3.

We have next the history of similar remains as far as hitherto recorded, together with a sketch of the views of the respective authors, in the course of which the conclusions of Dr. Lund are given, but pronounced to be somewhat startling. Then we are presented with a concise description of the skeleton, in the following words.

"The singularly massive proportions of the skeleton of the Mylodon robustus arrest the attention of every observer, and are not less calculated to excite the surprise of the professed comparative anatomist.

"A trunk, shorter than that of the Hippopotamus, is terminated behind by a pelvis, equalling in breadth and exceeding in depth that of the Elephant. This capacious bony basin rests on two massive but short hind extremities, terminated by feet as long as the femora, set at right angles to the leg, as in the plantigrade animals, but with the sole slightly turned inwards.

"A tail equalling the hind limbs in length, and proportionally as thick and strong, assists in supporting, rather than depends from, the broad sacral termination of the pelvis.

"The sacrum is lengthened at the expense of the lumbar vertebræ by a continuation of the general anchylosis through that region.

"A long and capacious thorax is defended by sixteen pairs of ribs, most of which equal in breadth those of the elephant, and all the true ribs are clamped by massive and completely ossified cartilages to a strong and complicated sternum.

"The scapulæ, distinguished by their unusual breadth, and by the osseous arch connecting the acromial and coracoid processes, are attached to the large manubrium sterni by strong and complete clavicles.

"The humeri, short and thick, like the femora, have their muscular processes, ridges and condyles still more strongly developed; but the rotatory and lateral movements are unobstructed by any inordinate production of the proximal tuberosities.

"The fore-arm is longer than its corresponding segment in the hind limb, has both bones distinct, and equally remarkable for their great breadth and the angular form occasioned by the prominence of the intermuscular ridges; yet the mechanism for free pronation and supination is complete.

"The fore-foot is pentadactyle, but so unusually massive are the proportions of the radius and ulna, that, though actually broad and thick, it appears relatively small; and notwithstanding certain fingers are terminated by claw-bones of great size and length, yet owing to the form of their proximal phalanges and metacarpal bones, it is short in proportion to its breadth.

"The hind foot is tetradactyle, with the two inner toes elongated and armed with unequal but large claws.

"Both the fore- and hind-feet are remarkable for the shortness, breadth, and ungulate character of the two outer digits, which, when the Mylodon stood or trod upon the ground, must have principally sustained the superincumbent weight.

"A skull, smaller than that of the ox, but long, narrow and terminated by a truncated muzzle, is supported by a short neck composed of seven cervical vertebræ.

"These vertebræ are freely articulated together, and are succeeded by sixteen dorsal or costal vertebræ, remarkable for their broad and high spinous processes, which are nearly equal, and have an uniform inclination backwards.

"The capacious trunk, thus slightly elevated upon its short and strong supporters, presents the form of a cone, gradually tapering forwards from the enormous pelvis which forms its base, to the short neck and slender head."—*Id.* 15. K.

(To be continued).

Note on a White Shrew Mouse. A few days since a labourer brought me a snowy white shrew mouse, which he had caught in a meadow while making hay. It proved to be a variety of the male of Sorex araneus. Its teeth were jet black, and its eyes of a pale pink colour. It was rather larger than the generality of its species, and less timid in captivity, eating freely, and not being so intent upon escape as is usually the case with most of this tribe when first enclosed within the narrow limits of a cage. It was fated, however, not long to tenant its new abode: on the third day of its captivity it lost its life in a bold attempt to regain its liberty—adding another victim to the catalogue of those whose beauty has proved their ruin! Has it ever been accurately ascertained what causes the death of such numbers of the common shrew? At some seasons of the year they may be picked up dead in the lanes and about hedges in this neighbourhood, almost by dozens. Some disease peculiar to them must, I should imagine, be the cause, as I never could observe any external marks of injury.—*L. Pemberton Bartlett; Kingston, near Canterbury, July* 28, 1843.

Note on the Mortality of the Common Shrew. "Both our species of Sorex seem to feed by preference on insects and worms; and thus, like the mole, their flesh is rank and offensive to most creatures, which reject them as food. The common shrew, in spring and summer, is ordinarily in motion even during the day, from sexual attachment, which occasions the destruction of numbers by cats, and other prowling animals; and thus we find them strewed in our paths, by gateways, and in our garden walks, dropped by these animals in their progress. It was once thought that some periodical disease occasioned this mortality of the species; but I think we may now conclude that violence alone is the cause of their destruction in these instances. The bite of this creature was considered by the ancients as peculiarly noxious, even to horses and large cattle, and variety of the most extraordinary remedies for the wound, and preventives against it, are mentioned by Pliny and others. The prejudices of antiquity, long as they usually are in keeping possession of the mind, have not been remembered by us; and we only know the hardy shrew now as a perfectly harmless animal, though we still retain a name for it expressive of something malignant and spiteful."—*Knapp's 'Journal of a Naturalist,'* p. 145.

Note on a Singing Mouse. Our fathers had talking birds out of number—parrots, cockatoos, ravens, magpies, jackdaws, nightingales, bullfinches and canaries; they were favoured with exhibitions of highly accomplished pigs, dogs, elephants, monkeys and bears: but we believe a singing mouse is a rarity reserved to comfort the present generation of men. Having received a card of invitation, we were not long in availing ourselves of so distinguished a privilege; and whatever doubts we might previously have entertained, they at once vanished when we found ourselves face to face with the murine Orpheus. His song is very subdued, occasionally almost inaudible, but the notes are sweet, and follow in rapid succession like those of a very voluble canary; in fact, if the mouth of a canary were carefully closed, and the bird, in revenge, were to turn ventriloquist, and sing in the very centre of his stomach, we should have just that subdued melody in which the mouse seems to delight. The gift appears perfectly natural, and exercised solely for the pleasure of its possessor.

The history of the mouse is on this wise. A lady residing at No. 24, Red Cross Square, after retiring to her chamber for the night, heard strains of delicious music, now swelling on the ear, and anon dying away as in the recesses of a closet. Could it be the ghost of a departed canary bird, revisiting the scenes of his captivity? Could it be a *fetch* with mellifluous voice, come to summon her from this wearisome world? Could it be an enamoured and gallant Lothario, serenading some coy beauty of the Square with a bird-organ? Ah; no! Could it be a living bird? The cat was suggested as a remedy. Grimalkin was summoned to catch or scare away the nocturnal melodist. It was to no purpose; the cat's attention was absorbed by the mice, and the room was filled with music as before. The cat was dismissed and traps were set. A mouse was caught—a fine handsome fellow, and a perfect patriarch in magnitude and years. He was about to be hurried to execution, when lo! he burst forth into song. The mysterious music was explained at once. The life of the captive was spared, and he daily and hourly pours forth his gentle song for the amusement of all who incline to visit him; and we trust that not one of our readers who has the opportunity will omit to do so. We assure them that he is a zoological curiosity, quite worthy of examination. His address is still at 24, Red Cross Square.—*Ed.*

Harvest mice and Nest.

Note on the Harvest-mouse. A short time since, whilst reading an account of the harvest-mouse (*Mus messorius*), having met with a statement to the effect that this interesting little animal was peculiar to Hampshire, the following observations on its habits and localities may perhaps prove interesting to some of your readers. This, the smallest of British quadrupeds, was, I believe, first noticed by that acute observer and most charming describer of Nature, White of Selborne. From his notice of it, and its abundance in Hampshire, may have arisen the statement that it is peculiar to that county. Such, however, is not the fact, as I have observed it commonly in Kent and also in Cambridgeshire; and it is probably very generally to be found throughout England.* I have at different periods kept harvest-mice in cages, in order to observe their habits more closely. They are easily tamed, but never lose a certain degree of shyness. I have never yet been able to get them to breed in captivity. A short time since I had three in a cage; they showed no disposition to fight, and would eat before

* Professor Bell says it has also been found in Gloucestershire, Wiltshire and Devonshire.—*British Quadrupeds*, p. 300.—Ed.

me without fear. I found they drank a considerable quantity of water, and much preferred flies and other insects to grain: thus proving that they are not strictly granivorous animals. There is a peculiar grace and elegance in the attitudes of these little animals, particularly when cleaning themselves, and in climbing about the cage; and in the latter operation I observed that they frequently coiled the end of their tails round a wire, for the purpose of securing their hold. When suddenly startled, they often rested themselves on their hind feet, and raised the body in a listening attitude, and, after taking a survey of surrounding objects, either precipitately retreated to the interior of the cage, or resumed their accustomed attitude, according to the effect the sudden fright had upon them. The nests of these mice I have frequently found, and very neat and compact they are; there is no visible aperture whatever, and it is still a question how the mother contrives to give each of her young the necessary sustenance, as the litter, even when quite young, very nearly fill the whole space in the nest, and after a little time they completely fill it. It was the opinion of White that the parent mouse opened the nest at different parts, and so afforded nourishment to each one of her offspring, taking care to close all safely again. The nests are usually very ingeniously suspended from two or three stalks of corn, and are perfectly round.—*L. Pemberton Bartlett; Kingston, near Canterbury, July* 28, 1843.

Note on the Habits of the Harvest-mouse in confinement. "About the middle of September, 1804, I had a female harvest-mouse given to me by Mrs. Campbell, of Chewton House, Hants. It had been put into a dormouse cage, immediately when caught, and a few days afterwards produced eight young ones. I entertained some hopes that the little animal would have nursed these, and brought them up; but having been disturbed in her removal, about four miles, from the country, she began to destroy them, and I took them from her. The young ones, at the time I received them (not more than two or three days old) must have been at least equal in weight to the mother.

"After they were removed, she soon became reconciled to her situation, and, when there was no noise, would venture to come out of her hiding-place, at the extremity of the cage, and climb about among the wires of the open part before me. In doing this I remarked that her tail was, in some measure, *prehensile;* and that, to render her hold the more secure, she generally coiled the extremity of it round one of the wires. The toes of all the feet were particularly long and flexile, and she could grasp the wires very firmly with any of them. She frequently rested on her hind-feet, somewhat in the manner of the jerboa, for the purpose of looking about her; and in this attitude could extend her body, at such an angle as at first greatly surprised me. She was a beautiful little animal, and her various attitudes in cleaning her face, head and body, with her paws, were peculiarly graceful and elegant. For a few days after I received this mouse, I neglected to give it any water; but when I afterwards put some into the cage, she lapped it with great eagerness. After lapping, she always raised herself on her hind feet, and cleaned her head with her paws.

"She continued, even till the time of her death, exceedingly shy and timid; but whenever I put into the cage any favorite food, such as grains of wheat or maize, she would eat them before me. On the least noise or motion, however, she immediately ran off, with the grain in her mouth, to her hiding-place.

"One evening, as I was sitting at my writing-desk, and the animal was playing about in the open part of its cage, a large blue-fly happened to buzz against the wires. The little creature, although twice or thrice the distance of her own length from it, sprang along the wires with the greatest agility, and would certainly have seized it,

had the space betwixt the wires been sufficiently wide to have admitted her teeth or paws to reach it. I was surprised at this occurrence, as I had been led to believe that the harvest-mouse was merely a granivorous animal. I caught the fly, and made it buzz in my fingers against the wires. The mouse, though usually shy and timid, immediately came out of her hiding place, and running to the spot, seized and devoured it. From this time I fed her with insects, whenever I could get them, and she always preferred them to any other kind of food that I offered her. When this mouse was first put into her cage, a piece of fine flannel was folded up into the dark part of it, as a bed, and I put some grass and bran into the large open part. In the course of a few days all the grass was removed; and on examining the cage, I found it very neatly arranged betwixt the folds of the flannel, and rendered more soft by being mixed with the nap of the flannel, which the animal had torn off in considerable quantity for the purpose. The chief part of this operation must have taken place in the night; for although the mouse was generally awake and active during the day-time, yet I never once observed it employed in removing the grass. On opening its nest, about the latter end of October, 1804, I remarked that there were, amongst the grass and wool at the bottom, about forty grains of maize. These appeared to have been arranged with some care and regularity; and every grain had the corcule, or growing part, eaten out, the lobes only being left. This seemed so much like an operation induced by the instinctive propensity that some quadrupeds are endowed with, for storing up food for support during the winter months, that I soon afterwards put into the cage about a hundred additional grains of maize. These were all, in a short time, carried away; and on a second examination, I found them stored up in the manner of the former. But though the animal was well supplied with other food, and particularly with bread, which it seemed fond of; and although it continued perfectly active through the whole winter, on examining its nest a third time, about the end of November, I observed that the food in its repository was all consumed, except about half-a-dozen grains. This interesting little animal died in the month of December, 1806, after a confinement of two years and a quarter. I have some reason to believe that its death was occasioned by water being put into its cage, in a shell picked up on the sea-shore, that had been much impregnated with salt."—*Bingley's Quadrupeds, p.* 267.

Note on the Nest of the Harvest-mouse. "I have procured some of the mice mentioned in my former letters, a young one, and a female with young, both of which I have preserved in brandy. From the colour, shape, size, and manner of nesting, I make no doubt but that the species is nondescript. They are much smaller, and more slender than the *Mus domesticus medius* of Ray, and have more of the squirrel or dormouse colour. Their belly is white; a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest; and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat. One of these nests I procured this autumn, most artificially platted, and composed of the blades of wheat; perfectly round, and about the size of a cricket-ball; with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well filled, that it would roll across the table without being discomposed, though it contained eight little mice, that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively, so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them

again when the business is over: but she could not possibly be contained herself in the ball with her young, which, moreover, would be daily increasing in bulk. This wonderful procreant cradle, an elegant instance of the efforts of instinct, was found in a wheat-field suspended in the head of a thistle."—*White's 'Natural History of Selborne,' Part* i. *Letter* xii. *' To Thos. Pennant, Esq.'*

Note on the Nest of the Harvest-mouse. "It was beautifully and elaborately constructed of the panicles and leaves of three stems of the common reed, interwoven together, and forming a roundish ball suspended on the living plants, at a height of about five inches from the ground. On the side opposite to the stems, rather below the middle, was a small aperture, which appeared to be closed during the absence of the parent, and was scarcely observable even after one of the young had made its escape through it. The inside, when examined with the little finger, was found to be soft and warm, smooth and neatly rounded, but very confined. This nest contained but five young: but one less elaborately formed, previously examined by Dr. Gloger, was found to afford shelter to no less than nine. The panicles and leaves of the grass were very artificially woven together, the latter being first slit by the action of the little animal's teeth into more or less minute bands or strings. No other substance was used in the construction of the nest, which was altogether without cement, or any means of cohesion save the interweaving of its component parts: it consequently suffered considerable disturbance, even from the most careful handling, losing in neatness of form as much as it gained in its increasing size."—*Bennett's White's Selborne; note at p.* 58.

Note on the Harvest-mouse. "As to the small mice, I have farther to remark, that though they hang their nests for breeding up amidst the straws of the standing corn, above the ground, yet I find that in the winter they burrow deep in the earth, and make warm beds of grass; but their grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near a hundred, most of which were taken, and some I saw. I measured them, and found that from nose to tail, they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois; so that I suppose they are the smallest quadrupeds in this island.—*White's Selborne; Part* i. *Letter* xiii. *' To Thos. Pennant, Esq.'*

Note on the Harvest-mouse. "The harvest-mouse (*Mus messorius*) in some seasons is common with us, but, like other species of mice, varies much in the numbers found. I have seen their nests as late as the middle of September, containing eight young ones entirely filling the little interior cavity. These nests vary in shape, being round, oval or pear-shaped, with a long neck, and are to be distinguished from those of any other mouse, by being generally suspended on some growing vegetable, a thistle, a bean-stalk, or some adjoining stems of wheat, with which it rocks and waves in the wind; but to prevent the young from being dislodged by any violent agitation of the plant, the parent closes up the entrance so uniformly with the whole fabric, that the real opening is with difficulty found.

"They are the most tame and harmless of little creatures; and, taking shelter in the sheaves when in the field, are often brought home with the crop, and found in little shallow burrows on the ground after the removal of a bean-rick. Those that remain in the field form stores for the winter season, and congregate in small societies in holes under some sheltered ditch-bank. An old one, which I weighed, was only one dram and five grains in weight."—*' Journal of a Naturalist,' p.* 139.

Notes on some Peculiarities in the Manners of the Water Rat.
By the Rev. J. C. Atkinson, B.A.

During my under-graduateship at Cambridge, I used occasionally to amuse myself with pistol-shooting; and when tired of perforating the mark on the tree, or in the gravel-pit, would bend my steps to the river or ditches, on the banks of which I was pretty sure to find abundance of water-rats. On one of these occasions I first noticed a peculiarity in the habits of the water-rat, which I have since seen exhibited in various places and at various times. This peculiarity resembles what in man is called "loss of presence of mind;" — what it is to be called in the rat, I do not know.

In the excursions above mentioned, I made use of a pocket pistol almost as frequently as of that more unerring instrument, the double-sighted, hair-triggered, duelling pistol; and, consequently, I missed my mark more frequently than I hit it.

Armed with this weapon on the occasion in question, I espied a rat sitting on the bank of a ditch: I fired at and missed it, but it scarcely moved. I reloaded — and it is a work of time to load a pocket pistol — fired again, and with the same result. Six times did I reload, and seven times did I fire, before the persecuted animal made an attempt to escape. If, after a shot, it moved at all, it seemed to do so unconsciously, and only a few inches, and then stopped again. After the seventh shot it rather fell than jumped into the water, but *did not attempt to dive*, as they almost invariably do when disturbed at any distance from their hole, but swam slowly along by the side. A stone I threw took effect on its head, and I succeeded in getting it out; but on looking at it closely, I could not find the least trace of injury inflicted by either of my balls: all its powers, beyond the merely mechanical ones, seemed to have been completely paralyzed by terror at the first report.

If any suspicion had remained in my mind, as to the possibility of the first ball having grazed its head, and produced this idiotcy (if I may so use the word), it would have been effectually removed by subsequent experience. Nor can it be said "perhaps it was a young one, and not come to 'years of discretion.'" It was an old rat and of large size: and moreover, the largest water-rat I ever saw in my life, betrayed, under similar circumstances, the same symptoms. The last-mentioned, too, had even more abundant and inviting opportunities of escape than the former. I was in a "funny," — as the small boats at Cambridge are called,—on the Cam, floating slowly down the stream,

and therefore every instant widening the distance between myself and the rat, which was partially concealed among tall flags on the river bank. But I had certainly two, and, I think, three, shots at him, and the effect of the first was just to make him show himself more plainly.

A short time after, I was on a visit in Norfolk, at a place about six miles from Brandon. Here there were many ditches, dividing the meadows from one another, and in the banks of these ditches there were immense numbers of water-rats. If I chanced to catch one asleep and threw a stone at it, and the stone made much noise and splash, the rat generally behaved in the same way, and waited patiently until a second or third missile had been directed at it.

And very recently I have witnessed a more striking instance still; for in this case there was no noise to startle, much less to terrify. I was fishing in the stream which flows near my residence, and on jumping across a small burn running into it, came upon a water-rat. It took to the water immediately, of course: but the water was shallow and it could not dive; and the current was strong and it could not make much progress. When it had swum about six or eight feet into the stream, I tapped it with the end of my fly-rod, which is not thicker than a crow-quill, and therefore could not inflict a very severe blow, even if I were willing to risk breaking it, by striking with some degree of force. On receiving the tap the rat attempted to dive; but in vain, by reason of the shallowness of the water. I repeated the tap, and the rat took no notice of it. I then gave it a third touch, when it turned directly round, put its head under water (which was now a little deeper), and swam directly to my feet; thus running headlong into the danger it had endeavoured to avoid. Had it turned its head down-stream, it would have been in safety immediately; but in the extremity of its alarm, occasioned by my sudden appearance and heightened by the application of the rod, it seemed to lose all self-possession, and to be incapable of showing that instinctive apprehension of what is best to be done, which all animals, when threatened by danger, are so ready to exhibit.

I know of nothing analogous to this (what I suppose to be) manifestation, on the part of the water-rat, of the effects of terror. The Hanover rat betrays nothing of the kind; and I have shot at them almost as often as at water-rats. They frequently visited my rooms at Cambridge, and, in the long vacation, in considerable numbers: indeed I have shot them as I sat reading. Yet even here, although the report of the pistol seemed louder, from the circumstance of the sound being confined, and though the rat shot at might be a juvenile mem-

ber of the society, it never had the civility to wait for a second shot if I missed the first. And I believe it is a well known fact, that if you come upon a Hanover rat in such a manner that he has no chance of escape, he will even fiercely attack you instead of giving way to terror.

I may be wrong in the solution I have suggested for this seemingly anomalous conduct of the water-rat; and moreover, it may not appear to other and more experienced observers the anomaly it does to me. But as I said above, I do not know of anything analogous to it; and those facts with respect to the habits of animals, inhabitants of our islands, which have some appearance of analogy, do not, on examination, prove really to have any. I refer to such instances as the unresisting victory the Hanover rat, under certain circumstances, yields to the ferret; the sluggish, nerveless, apologies for attempts to escape made by the hare and rabbit when pursued by a stoat; the remaining of the same animals in their seats until seized by the dog, or taken up by the hand; — and the like.

In the first case the rat has got into the hole which affords no mode of exit, by its very efforts to escape from the object of alarm; and this circumstance at once removes from it all resemblance to the matter in question. In the next instance, supposing the hare or rabbit to be influenced by despair (which is, I think, the common explanation of their behaviour), just *add* to its alarm by showing yourself suddenly, or raising an outcry, and away it goes at full speed. And again, when either of these animals perseveres in keeping its seat, is it not in the hope of escaping detection, and so avoiding danger? And does it not usually occur with *young* animals?

The water-rat is accused of sucking eggs — water-birds' eggs; and justly, I dare say: but I may be permitted to mention the following circumstance. A duck had its nest on the bank of a moat in Essex, in which nest it laid ten or twelve eggs, and proceeded to sit. Two water-rats had their hole close by, in the same bank. That they knew the eggs were there, was indisputable, for I saw them actually *upon* the nest. But the eggs were not taken away, neither were they sucked. I can only suppose, therefore, that the rats eat the moor-hen's eggs, as being the eggs of a bird "*feræ naturâ*," but spared these ducks' eggs, forasmuch as they were private property.

They are also accused of taking the baits off the hooks, when night lines are set for pike or eels. In this case, I fear I cannot say anything in their favour; on the other hand, I must allow I cannot bring the charge clearly home to them. Appearances, however, are very strongly against them; for I have had baits abstracted, with the loss

of which I felt convinced no *fish* had anything to do: and as nothing but either a rat or a fish could have been the guilty party, I fear the former will not go out of court with his character uninjured. It is true, a Hanover rat may sometimes be found on the river-bank, and a late article in 'The Zoologist' (Zool. 212) shows that he has a partiality (and gratifies it too) for lamperns. Now if he can capture a living lampern, he can surely carry off a dead bait, which, though thrown far into the water, is not unfrequently brought by circumstances near to the side. Still, the Hanover rat, although equally willing to sup on fish, has not the same capabilities as his congener for catching them, and besides, is (comparatively) very rarely, and but at one season of the year, found near the water. J. C. Atkinson.

Hulton, Berwick-on-Tweed,
July, 1843.

Note on the Water-rat. "A large stagnant piece of water in an inland county, with which I was intimately acquainted, and which I very frequently visited for many years of my life, was one summer suddenly infested with an astonishing number of the short-tailed water-rat, none of which had previously existed there. Its vegetation was the common products of such places, excepting that the larger portion of it was densely covered with its usual crop, the smooth horsetail (*Equisetum limosum*). This constituted the food of the creatures, and the noise made by their champing it we could distinctly hear in the evening at many yards' distance. They were shot by dozens daily; yet the survivors seemed quite regardless of the noise, the smoke, the deaths, around them. Before the winter, this great herd disappeared, and so entirely evacuated the place, that a few years after I could not obtain a single specimen. They did not disperse, for the animal is seldom found in the neighbourhood, and no dead bodies were observed. They had certainly made this place a temporary station in their progress from some other; but how such large companies can change their situations unobserved in their transits is astonishing. Birds can move in high regions and in obscurity, and are not commonly objects of notice; but quadrupeds can travel only on the ground, and would be regarded with wonder, when in great numbers, by the rudest peasant." — '*Journal of a Naturalist*,' *p.* 142.

Notes on Birds injurious to Agriculture, and on the Benefits also derived from them. By Archibald Hepburn, Esq.

The district to which the following observations apply, presents features different from those exhibited by some parts of England, and these it may be useful to note. Our fields are generally of a moderate or large size, well fenced with hawthorn hedges, and sometimes, though rarely, with stone walls: approved modern practice reduces the former to the smallest possible dimensions compatible with utility.

They are commonly pruned or *switched* every year, or, if the adjoining field is pastured, the twigs are allowed to grow till the field is again broken up. The land is subjected to a rotation of crops; permanent pastures we have none, unless in the neighbourhood of the mansions of the aristocracy, or on rocky ground difficult of tillage. Hedge-row trees are not common, though universally admired; they are a great nuisance, blighting the hedges, *lodging* the crops in autumn, and harbouring the plundering ring-dove.

About the beginning of the present century many of our hedge-rows were as tall as those still to be found in many parts of England. There the pretty jay screamed harshly in every quarter, the mellow bullfinch piped to his fellows, and the goldfinch flocked in all our borders; but notwithstanding the mighty changes which have made the district like one vast garden, the thrush, blackbird, hedge-chanter, wren, chaffinch and green linnet, still nestle in our hedge-rows, and the corn and yellow buntings and whitethroats on our ditch-banks, which modern improvement has spared. The sweet-toned willow-wren, and sometimes also the wood-wren, the reed bunting and the chattering sedge-warbler, may here and there be heard in some tall *march-hedge*, by a slow running stream, or by the horse-pond, or amongst the trees near the farm-house; and, in suitable localities, the fitful redstart and quiet little flycatcher build their nests in the garden; but, unless in fields bordering upon woods or plantations, the voices of our finer summer warblers are never heard.

The following notes are the result of five years' daily observation. They are very incomplete, but I trust that time will enable me to supply deficiencies, and perhaps oblige me to contract the latitude of some of my general views of the habits of two or three species, founded on an insufficient number of observations.

The Chaffinch. The ploughing of our stubble fields is generally finished about the end of December: those which have been sown out with grass seeds may still afford a slight supply of food, but it is then that the great body of chaffinches seek shelter near the homestead, gleaning their food in the cattle-yards, at the barn-door, on the sides and round about the stacks. Here, as in the fields, they are distinguished for their watchfulness, and well do the little birds know the import of their warning note. The dipper may be heard by the mountain stream the livelong year, and the bold missel thrush may stir the woodlands in sunny hours, even in midwinter; here the robin and the wren are silent during the dead season, and the chaffinch

is the leader of the vernal chorus. When the oats are sown in March, many small flocks betake themselves to the fields, feeding on the uncovered grains, and such small seeds as may be turned up in the course of tillage. Even our sheltered woods on the banks of Whittingham-water are seldom altogether deserted, for the autumn leaves, when swept aside by the blast, seem to disclose a multitude of small seeds congenial to their taste. As the season advances, these flocks gradually disperse, and none remain about the farm-yards but such as breed in the garden and neighbouring hedge-rows, and they may be daily seen foraging for a supply of their winter fare, even in midsummer, but desist entirely from pilfering from the sides of the stacks: even the new fledged young partake of such food. During the summer months insects and their larvæ constitute their chief support, perhaps I might almost say, in many cases their only support, for they are often found in the loneliest places in woods and plantations. The first annoyance they give to the farmer is, by destroying his early crops of radishes, turnips and onions, in the garden, besides making sad havoc with his polyanthuses and auriculas; but a few barn-door fowls' feathers inserted into a piece of cork, and allowed to dangle in the wind over the beds, are sure to drive away our merry little songster, who does our apple, pear and apricot trees good service, when infested by leaf-rolling caterpillars, besides other insect foes of which we take no note. He is also a very useful auxiliary to the farmer, as well as to the gardener, by destroying a multitude of small seeds, amongst which I may enumerate those of the chickweed, groundsel, bulbous and hairy crowfoot. He is one of the most determined of all the plunderers of our turnip-seed, and I see that those who practise this branch of husbandry sustain considerable loss, notwithstanding that a watch is daily set. When our grain crops ripen in August and September, the chaffinches which haunted the recesses of woods and plantations flock to their borders, and unless the farmer is attentive to such matters, as from their small size they cannot be perceived at a distance, their depredations are often carried on with impunity. The trees around our dwellings are also the rendezvous of parties of plunderers, who sometimes join the sparrows, but oftener keep together, and feed amongst the standing corn, at a greater distance from the hedge-row than the latter ever venture. After the wheat is cut, and placed in shocks, and whilst yet in a soft state, I have observed the chaffinch deprive each grain of its outside coat previously to swallowing it. Although they always prefer feeding in the neighbourhood of trees or bushes, yet, as the season advances, they are

compelled to haunt more exposed situations. Of the cereal grasses, wheat and oats are their favorites, barley—the only other species cultivated in these parts—being held in less esteem.

The Brambling. The beautiful brambling is one of our winter visitants, arriving in November and departing in March. It mingles with flocks of chaffinches and other granivorous birds, to search the fields for seeds and grain, and when the supply fails it comes to the onstead to share in the general abundance of food for the feathered tribes. I have not observed it feeding on the grain which careless reapers have exposed on the sides of the stacks, but only on the ground round about the latter, by the barn-door, and in the cattle-yards: I have seen it enjoying itself in our fields at oat-seed time; but on the whole it seems to be a very inoffensive species during its stay with us. I have not met with any satisfactory account of its habits during its brief sojourn amongst the pine-groves of Norway.

The Sparrow. A large flock of sparrows haunting a homestead in winter, is no bad sign of a well-filled stackyard, for where there is no corn there will be no sparrows. Much has been said on the comparative merit of sparrows as destroyers of insects and grain: a long series of observations induces me to assert that with us, they prefer insect food, when it can be procured, but at the same time they like to vary their diet at every season with grain; for no sooner is the insect world called into life, and the hawthorn puts forth its tender leaves in April, than their depredations cease, and they scour the hedges, and even visit plantations at a considerable distance in quest of insect prey. There, many of their summer haunts are chosen with reference to a supply of such food. I have first to complain of their depredations in the garden, which are similar to those of the chaffinch, besides having a great liking for green pease. Like the latter, they destroy many insects and their larvæ, but are not so assiduous in their attacks on the leaf-rolling caterpillars. Turnip-seed is chosen food. We have no thatched roofs on this farm: one would suppose that, from the coldness of the climate, they would tenant every cranny; far from it, they prefer nestling in our hollies, spruce firs, and tall laurel bushes, commencing as early as March, and often prosecuting their labours amidst the falling snow: concerning this habit I will be more explicit on some future occasion. In August, just when the grain begins to ripen, they assemble in vast flocks, and, if not carefully watched, will soon commit sad havoc on the fields of wheat, oats

and barley, nigh to the onstead; indeed these crops are never safe from their rapacity till carried into the yard, and even then the exposed ears fall a prey to them, and other little birds: it is impossible for them to burrow into our stacks, far less to pull out the straws. When the fields are cleared they will forage in the neighbouring stubbles, keeping close to the hedges so long as the supply lasts. I often see them feeding on the seeds of the charlock thrown from the barn, but I have not seen them eating those of any other weed: in the garden, the seeds of the tamarisk and white broom are special favorites, and sometimes the petals of the dahlia.

The Goldfinch. Many years have now elapsed since the goldfinch nestled about our onsteads and villages, where they were once as plentiful as sparrows. Grey-haired ploughmen talk of their services amongst the thistles, and other weeds in the outfield; but infield and outfield, the wretched agricultural practices of the olden times, have alike passed away, and with them this bright finch, which is now only known as a rare straggler.

The Linnet. It is always pleasant to listen to the song of the brown or grey linnet, in the gay furze-thicket, on an early summer's morn, or to the choral bursts of assembled hundreds on a hedge-row tree, in a calm winter's day, enlivening the bleak and desolate fields with their merry sports, as they search the stubbles for seeds of the charlock and grain: even in open weather they frequent the stack-yard, where I perceive that the heap of seeds cast out from the barn has more attractions for them than any other food. Early in April these gatherings disperse, and the several pairs betake themselves to their breeding-grounds, whin-thickets on the slopes of hills and by the sides of lanes, the only places where they build their nests. They are very sociable birds: even at this season, small parties search the pastures and fallows in quest of the seeds of the chickweed, groundsel, dandelion, &c. They are the most determined of all the plunderers of our fields of turnip-seed; though repeatedly driven off by the gun or the rattle of the watchman, yet they soon return, with bounding flight and gay carol, the merriest, lightest-hearted robbers in the world: autumn comes with good store of ripened seeds, but as many of these are covered by the ripening grain, the linnets occasionally help themselves to a few oats near a hedgerow, till the reaper has cleared the fields, then they revel in abundance, and confer incalculable benefits on every farmer, who allows them quietly to enjoy the bounties which Nature hath spread abroad with no sparing hand.

The Twite. A few twites or mountain linnets assist the grey species in clearing our stubbles of the seeds of obnoxious weeds during winter, but I am not aware that they do any harm to our crops in autumn.

The Greenfinch. Even the least attentive observer of living Nature cannot fail to remark the fitful, frolicsome flight of the green linnet, during the breeding season; how he circles and plunges about the elm trees in May and June, rifling their seed-bunches, and filling the air with his garrulous song. During the summer months it subsists largely upon insects and their larvæ, as well as upon the downy seeds of the groundsel and dandelion, alighting adroitly upon the stems, bearing them to the earth, and feasting at its leisure. Turnip-seed, and the seeds of the chickweed, charlocks and various grasses, &c., also enter into their bill of fare, till the crops of wheat and oats begin to ripen, when they occasionally do some damage along the borders of the fields, but when the grain is cut and carried they search the stubbles in large flocks, which are fully as animated and as amusing in their habits as those of the grey linnet. Green linnets may be daily seen in our yards all the year round, though of course they are most abundant during the inclement months of winter, when they pilfer the exposed ears of corn from the sides of the stacks, and search the cattle-yards, and by the barn-door.

The Bunting or Corn Bunting. There is a fact connected with the local distribution of the corn bunting which puzzles me very much. It is abundant on the sunny-side hills which divide our valley from that of the Tyne, also on some high grounds to the westward, and yet it is only known as a rare straggler on this farm, and I have only seen it three or four times in the stack-yard. However, I am sufficiently acquainted with its habits to be able to say that it feeds largely upon insects, small seeds and grain, and that it frequents the neighbouring stack-yards all the year round. Mr. Knapp, in his very pleasant 'Journal of a Naturalist,' accuses this bird of doing much damage to ricks or stacks of barley, by pulling out the straws to get at the ears: now I candidly confess that, along with all my countrymen to whom I have mentioned this statement, I was sceptical of its accuracy. However, I thought it unfair to pass an opinion on the same, until I had made enquiries about the method in which stacks are built in Gloucestershire; so I applied to a relation, who has resided for a few months in Mr. Knapp's neighbourhood, and an answer has been returned that oats and barley are never bound into sheaves, but are harvested like hay. It affords me very sincere delight to be able to

make this statement, to vindicate the character of Mr. Knapp, whose work I have ever held in high esteem. In the Lothians, and I believe throughout Scotland, grain crops are invariably bound into sheaves. With us the sickle is almost universally used, and with a little care on the part of the reaper, few heads are thrown into the end of the sheaf. After the breeding season is over the buntings keep together, in small parties, till the following spring.

The Yellow Hammer or Yellow Bunting. With us, the yellow bunting is essentially the bird of the cultivated farm. He is never seen on our wild moors, and the waving woods have no charm for him; no other bird can dispute his claim to the title. Like our other little granivorous birds they associate in flocks, to search the stubbles, and when these fail they adjourn to the onsteads, helping themselves to grain and seeds wherever they can be found. At oat-seed time they may again be seen in the fields, and, along with other birds, claim the uncovered grains as their lawful prize. They commence their monotonous song about the middle of February; they and the chaffinches are our chief songsters during the latter snow-storms; the former do not cease till the second week in August, the last of all are the granivorous species, the corn bunting perhaps excepted. Even after they have dispersed to their several breeding-places, many individuals may be daily seen about the onstead, feeding on grain and small seeds, but at this season they chiefly subsist on insects, particularly Coleoptera; their young ones are largely supplied with crane-flies, (Tipulidæ). When assembled in considerable bands, before the commencement of harvest, they often injure fields of oats and wheat to a considerable extent, confining their depredations to the immediate neighbourhood of the hedge-row. In reference to their winter depredations on stacks, Mr. Wood, in his 'British Song-Birds,' page 300, says, "they (the yellow buntings) can obtain the object of their search from the very heart of the stack, by pulling out the long straws one by one." From this we must infer that the Staffordshire stacks are very small, and that the same slovenly style of agriculture prevails there as in Gloucestershire; but in our stacks the sheaves are always laid horizontally, or very nearly so, in concentric circles, except a few in the centre, on the ground, and on the top to finish off the structure, which soon becomes so firm that it requires a stout pull to draw out a single straw, and the chances are always ten to one that not a single grain is left by the friction on the spike or panicle, as the case may be.

The Reed Sparrow or Reed Bunting. The reed bunting is not very common with us, but I have observed the good service which it does by destroying insects and small seeds. In autumn it will sometimes collect in flocks, and attack our outfields for a short time. Most of them migrate from Scotland in October, returning in March, but now and then a straggler will pass the whole season in our fields and stack-yards.

The Snowflake or Snow Bunting. The snow bunting is one of our winter visitants, arriving in October and departing in March. It haunts the uplands, as well as the cultivated grounds of the interior, but is most abundant on the sea-coast farms, gleaning in the stubbles for grain, seeds and insects. During severe weather it haunts their stack-yards, and in the interior it removes to the sea-coast.

The Skylark. This farm is about five miles from the sea, as the crow flies, and its elevation may vary from two hundred to two hundred and forty feet. During the last five years I have regularly observed our skylarks depart in December, and return about the beginning of February; last season a few stragglers remained behind the rest. I believe they proceed to the sea-coast farms, but of this I cannot speak positively, and am also unable to estimate their relative abundance there, during the dead season. Shortly after ther arrival they commence their loud rejoicing songs, which are heard all the season through, till hushed in sultry July; they are then silent for a season, till the end of September, when their happy strains again resound through the still autumn day, far above the din of rural labour and the Irish reaper's song. This bird is never seen clinging to the standing corn, nor sitting on the shocks, but when his downward flight is ended, in crouching attitude he partakes of the common feast for all that lives. Snow-storms may drive him from his haunts, a cowering suppliant for our bounty, modest and retiring, and contenting himself with such grains and seeds as lie scattered about the stacks, but no sooner is the snow swept from the fields than he joyfully reasserts his independence. The early beetle is his delight: the stirring of the soil, at almost all seasons, affords him a supply of choice insect food, of which he is so fond that I have seen individuals hobbling amongst the young twigs, on the top of a close-pruned hedge, intent on capturing crane-flies (Tipulidæ). ARCHIBALD HEPBURN.

Whittingham, East Lothian, June, 1843.

(To be continued.)

Notes on the Crow. By W——. H——.

THE crow belongs to the genus Corvus, of which the raven in Scotland may be considered the type; but the varied localities they frequent has gradually imposed on each a set of manners and a method of living in some particulars as opposite as if the two birds belonged to distinct classes. The crow never soars into those regions occupied by the raven; and the raven never descends, unless compelled by the direst hunger, to those champaign levels occupied by man, where the crow is so continually to be seen: hence different views and different scenes impose on each opposite volitions and movements, and each has a mode of life peculiar to itself: even the schemes for their peculiar safety are widely different. Still, in specific characters, they very closely agree: they are of the same colour; they utter a very similar cry; and flesh, just entering a state of decomposition, is the favorite food of both: both, when driven by hunger, are equally cruel to weaker birds: they build at the same time; have the same period of incubation; and hatch in the same month—April. In the quality of their food, and in the way of obtaining it, they somewhat differ; for the raven generally selects the noblest birds as his prey, while the crow has recourse to the meanest and most ignoble shifts to obtain food, which is frequently the filthiest garbage deposited on the dunghill.

In the lambing season the crow is the dread of the shepherd, and commits unheard-of cruelties: at this season its nest is overflowing with young, which require an enormous quantity of food; and many an inoffensive creature is slain to gorge their craving appetites. The symptoms of parturition are as well known to the crows as to the shepherd, and a group may often be seen waiting with anxious expectation; and when the poor ewe is in a state utterly unable to defend herself, the hungry harpies fall on her without mercy, pluck out her eyes, and, when she cries with the pain, drive their strong beaks into her tongue and tear it out, piece by piece; at every fragment they swallow they give a satisfied gobble, and they never desist from their cruel task till life is extinct. If the mother escapes, the young lamb frequently becomes a victim before it has yet stood erect; its eyes and tongue are first selected, or its bowels drawn out.

I have witnessed many other acts of the crows' rapacity, which it is needless to relate; indeed they are little noticed, being exercised on creatures the loss of which does not diminish the happiness or comfort of man. When hungry I have known them take small fish from a considerable depth in the water, although they have no mechanism

of parts adapted for entering that element. I saw one pounce on a leveret, and bear it in its claws from the side of its mother, who ran a good way in a line below the course taken by the crow. Its wily life seems spent in threading along the bottoms of the glens, and tracing up their various adjuncts, looking intently and carefully into every ravine seeking for sick or diseased animals, it matters not whether they be wild or tame.

They build in trees, selecting in preference an old disbranched fir, an old thorn or birch, remnants of the ancient Caledonian forests, and situated either in deep glens or on the open hill-side. But the tree and the situation alike fail in giving security to the young, for it is very seldom that the shepherd fails to discover them. The nest is constructed of the same materials, and has the same form as the raven's. They feed their young with all kinds of animal substances they can purloin from the farm-house, or collect from the face of Nature; among the rest the eggs of every wild fowl that comes to the hill to breed, and if the nests have remained undiscovered, until the period of incubation has passed, still the young are as acceptable as the eggs, or even more so, for they are carried alive to the nest, in order that their own young may learn to murder, lacerate and destroy; and I really think, if grouse are plentiful in the vicinity, that one pair of crows, what with stealing the eggs and carrying off the young, will in a season destroy more of these birds than the keenest sportsman that takes to the muirs. Whatever the young reject as uneatable or indigestible—as bones, hair, egg-shells, &c.—the old crows instinctively carry to a considerable distance, but all to one spot, generally a little knoll. It is very curious to light by chance on one of these repositories of spoil, consisting of mice-down and mice-heads, lambs' wool, skin and bones, the egg-shells of every wild fowl that frequents our deserts, and a still larger quantity of egg-shells of the domestic hen and of the corn-crow [or rook]. In this country these last are gregarious, and feed only on corn or fruit, while the crow lives in pairs and is decidedly carnivorous.

Additional Note on the Raven. Very good naturalists inform us that the raven exists in large flocks, in those almost interminable regions which lie between the sources of the Mackenzie and Missouri rivers, — and that when the wandering tribes, who ramble through those pathless deserts, notice a flock of ravens hovering or wheeling above a certain space, it is a sure indication that an encampment of their countrymen, well stored with animal food, occupies the ground

below: this fact again incontestibly proves how great an influence the character of the earth's surface may exercise over the manners and manœuvres of those fowls and animals whose geographical range extends over distant and varied regions.

W****** H***.

Stobo Hope, July, 1843.

Notes on the Grouse. By W——. H——.

The grouse (*Tetrão* in Ornithology) is a genus of birds belonging to the order Gallinæ. In all our species there is a naked scarlet skin above the eye, and the feet are covered with feathers to the toes.* The following species are found in Scotland. The white grouse or ptarmigan (*Tetrão Lagopus*) is about fifteen inches in length, and weighs about nineteen ounces: its plumage is a pale brown or ash colour, and it is only found on our highest mountains, the summits of the loftiest Highlands in Scotland, the Hebrides and Orkneys: it is said formerly to have inhabited the lofty hills in the neighbourhood of Keswick, in Cumberland. The red game or moor-fowl (*Tetrão Scoticus*) is only known in the British islands: the length of the male is fifteen and a half inches, and its weight nineteen ounces. The black grouse or blackcock (*Tetrão Tetrix*) is fond of woody and mountainous regions, where it finds bilberries and other mountain fruits throughout the summer; in winter it feeds on the tops of the heather: a full grown blackcock measures twenty-two inches in length, and weighs about four pounds. The cock of the wood (*Tetrão Urogallus*) also inhabits woody mountainous countries; forests of pine afford them both shelter and food, for they devour the tops of the pines in such quantities as to impart a strong and disagreeable taste to their flesh: they also feed on various wild berries. Although these birds are common in Scandinavia, Germany, and other European countries, they have never been found in any part of Great Britain except the Highlands of Scotland. They are usually called capercalzie, or, in old law books, caperkally, and are supposed to be the wood or great grouse of Pennant, and the Ceilingconia of the ancient

* We may perhaps be allowed to observe that although in all the species the feathers may be said to extend to the toes, yet in two (Urogallus and Tetrix) the toes themselves are naked, while in other two (Scoticus and mutus) they are clothed with feathers to their extremities: the former pair of species have been termed Tetrão, the latter pair Lagopus. This generic subdivision is, we believe, almost universally admitted. *Ed.*

Britons. This bird had become extinct in Scotland: the demolition of the ancient and immense forests of fir laid the country open and naked, while the extirpation of the brambles and bushes, which produced a profusion of berries, deprived them of another source of sustenance. In 1745 they were frequently seen in Strath Spey; and the last seen in a state of perfect nature was in 1760, in Strath Glass. Attempts have lately been made to introduce this noble bird again into Scotland, and, as I hear, with good prospect of success; in particular in those immense forests of the East of Breadalbane which stretch along the Tay, they seem to be doing well, and to be falling into a regular system of breeding. To return, however, to the second species, the red game. The red grouse or common moor fowl is a hardy and a harmless bird: his life and manners give offence to no creature in his neighbourhood, but he is himself the unresisting prey of the rapacious birds which inhabit the same regions with himself: he is endowed with no weapons of defence: his flight, which is indeed rapid, is the only mode of escape with which he is provided: the goshawk is his deadliest enemy, his aim being swift and unerring: the eagle and the raven light on him in his roosting place, and murder him before he has power to take wing; they strike their talons into the fleshy parts of his body, in order that they may hold their victim fast; then one blow of their beak lays open the brain-pan, and all struggles for life instantly cease. In the first short struggle for life and liberty the poor fowl cries out most pitifully, but when the fatal blow is given all is still: I have often listened to the mournful screams until, suddenly silenced, I have known that life was gone. When a bird of prey attacks a grouse on the wing, he gets above him and strikes downwards at a considerable angle with the horizon, but, as the pursuer gains ground, the angle continues to increase, and the rapidity of motion becomes very great; then the grouse, finding his strength failing, suddenly dives towards the earth, and for a moment eludes his pursuer, whose speed has now carried him beyond the mark: the hawk almost instantly takes up, and returns to reconnoitre: if there be a dyke, heath or furze bush, there is yet a chance of life; the grouse creeps under its shelter, and squats motionless on the ground, but if the surface is naked and bare, there is no chance of escape; the hawks' talons are in his back, then come the screams—all the resistance he can make,—then the blow, and all is over.

The crow, as we have seen, commits desperate ravages among the grouse during the breeding season. Although the mother steals to and from her nest with the greatest secrecy, — although she seldom

leaves her charge even for a short airing, yet her retreat is often discovered, and her nest plundered of the eggs. But eggs and young are equally acceptable to the voracious robber: the day on which the young bird first breaks the shell is doubly hazardous: when it first inhales the vital air it gives a small but sharp chirp; the mother's feelings are all aroused, and she responds in a hoarse tone: the villain crow is lurking in the neighbourhood; he knows there is a nest at hand, and that the brood is about to hatch; he has learned this from certain movements of the parent grouse, which he has often watched, but, notwithstanding all his vigilance, the nest has hitherto escaped him: these sounds lead him to the very spot, and the fond mother must yield the objects of all her motherly feelings, or must herself become the victim of the ruthless destroyer. In an agony of fear she leaves the spot where all her cares have just terminated; she throws herself carelessly among the bushes, and flounces away in the heather, uttering all the while cries of terror and distress, but the crow heeds her not: he heard the young ones cry; his ear directs him to the nest, and there he gobbles the little ones one after another, though some are not yet ready to escape from the shell.

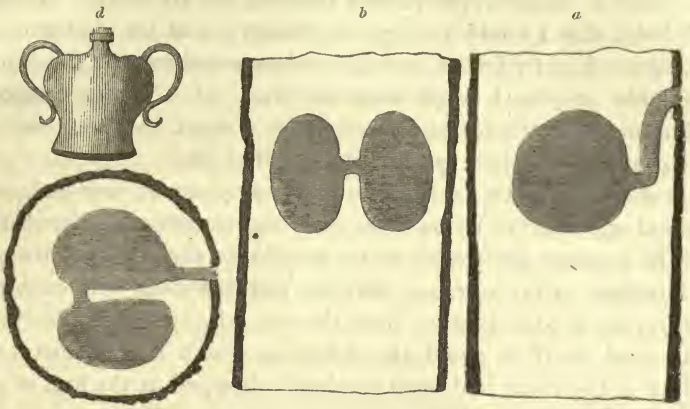
The places selected by the grouse for her nest are generally on the borders between heath and lea ground: this choice proceeds entirely from instinct: though the grouse feeds on heath, lives among heath, and is protected by heath, yet, by the common instinct of nature, she is aware of the danger of a heathery space to hatch in; she knows that she could not rear her little ones on a space of rank heath; the weaklings' legs would fasten among its small branches, or, in their endeavours to hide, they would thrust themselves below its stronger stems, and in either case, before they could escape, life would be extinct: a place is therefore chosen where the young have free and ample space the moment they leave the shell. Six or seven eggs is the usual number for a season; they are of a whitish brown, daubed over with darker spots: the hen sits very close, allowing the shepherd almost to trample on her before she springs. No creature uses more cunning to allure man or dog from the nest than the grouse.

The red grouse usually fly in pairs, yet a single bird is often seen: when snow is on the ground they congregate in flocks: in great snowdrifts they allow themselves to be overblown, but to no great depth, and then the poacher may easily beguile them by mimicking their cry.

W****** H***.

Stobo Hope, July, 1843.

Notes on the Blue Titmouse or Blue Mope. By M. Saul, Esq.



a, *b*, *c*. Sections of a tree, showing cavities made by a pair of blue titmice. *d*. A stone bottle in which another pair built their nest.

Thirty-one species of the titmouse genus are scattered over the globe; of these eight only are known in our own country.* They are remarkable for ingenuity and boldness, and do much mischief by picking off the buds of fruit-trees. The blue titmouse is a very prolific bird, laying from ten to twenty eggs, of a beautiful white, sprinkled over with delicate rust-coloured spots. They feed for the most part on seeds, fruit and insects, but also occasionally on flesh, and are particularly fond of the brains of other birds, which they get at by cleaving the skull with their strong beaks, when they are so fortunate as to find one dead. They are bold, restless birds, and are particularly cruel to birds less than themselves, and often attack and tease others that are three times their own size. In the months of April and May last my attention was attracted by a pair of these birds which had built a nest in an alder tree by the road-side where I had to pass, and the circumstances connected with it were so interesting to myself, that I thought they might prove acceptable to some of the readers of 'The Zoologist.'

The tree, or rather stump, was about four feet in height and ten inches and a half in diameter; and being covered with ivy, it had a very

* We are only acquainted with seven species of titmouse: — the great tit (*Parus major*), the blue tit (*P. cæruleus*), the crested tit (*P. cristatus*), the cole tit (*P. ater*), the marsh tit (*P. palustris*), the long-tailed tit (*P. caudatus*), and the bearded tit (*P. biarmicus*); the two last have been separated as distinct genera, the former under the name of *Mecistura*, the latter under that of *Calamophilus*.—*Ed.*

pretty appearance. My attention was first attracted to it by seeing a bird come out of the upper part of the tree and fly away. I found a small hole, that I could just get my finger in, at the spot where the bird appeared to fly from; and this hole seemed immediately to turn downwards, so that I could make nothing out. Being desirous of learning more of the matter, I retired to a short distance, and, concealing myself, watched for the return of the bird.

In a short time two birds made their appearance; one entered the hole, and appeared to be pecking away the wood inside, for as it managed to separate piece after piece, it brought them to the other bird, who remained at the entrance, and this last flew away with each piece, and carrying it to a distance from the tree, dropped it in the middle of the road, as if to avoid the detection which was almost certain to follow if the chips had been carelessly dropped at the foot of a tree in a frequented thoroughfare.

On the 12th of May, a boy having discovered the place, from the bird flying out at the moment he was passing, broke open the tree and took the nest, which contained eight eggs. I passed shortly afterwards, and had a good opportunity of observing the wonderful work which these little creatures had accomplished. It will perhaps assist my description if I give diagrams of three sections of the tree, made in different directions, two of them vertically and the third horizontally, (see p. 309). At the end of the short hole by which the birds entered, was a large cavity containing an old nest, where the young birds of a preceding year appeared to have been raised, and from the back part of this was a small round aperture leading to a second cavity, equal in size to the first, and evidently newly excavated; in this the eggs and nest of the present year were found: the passages and cavities were all finely worked, and as smooth as if done by the hand of man. Section *a* is cut lengthwise through *one* of the cavities only; section *b* is cut at right angles with *a*, and shows both cavities; and section *c*, cut horizontally, also shows both cavities and the passage which connected them. I have no doubt that the birds were working at the inner or new apartment when I first observed them.

I subsequently found another nest of these birds in an old sycamore tree, which, although containing only a single apartment, appeared to have been occupied many years. It required a carpenter's axe and much labour to get at this.

As a proof of the extraordinary places sometimes selected by these birds as situations for their nests, I may mention the following. An earthen bottle was placed on the garden wall of Mrs. Chorley, of Bol-

ton, near Lancaster, (fig. *d*, p. 309); in this a pair of blue titmice built their nest, hatched their eggs and reared their young. There was no cork in the bottle, and the birds had no other way of entrance than through the mouth, going up and down the neck of the bottle every time they carried food to their young ones, all of which, ten in number, were reared without accident, and made their escape unmolested through the neck of the bottle. When they were fairly gone the bottle was taken down, and the old nest found within: the bottle was fifteen inches deep, and the neck one inch in diameter. I am at a loss to know how the birds could manage to ascend the neck. M. Saul.

Fort Green Cottage, Garstang, Lancashire,
July 5, 1843.

Notes on the capture and appearance of some of our British Birds, in the county of Derby. By J. J. Briggs, Esq.*

(Continued from p. 180).

Willow-warbler, (*Sylvia Trochilus*). This diminutive little creature is mostly denominated the willow-warbler, for he loves osiers and willows; and no sooner has the lovely April arrived, with her warm breezes and refreshing showers, and feathered their branches, than he appears to salute us with his music. Few things are more amusing than to watch his manœuvres on some fruit or forest tree. Perchance he has alighted on a willow just opening into blossom: — witness his proceedings. Now he hides beneath a canopy of infant leaves—now climbs a cluster of downy catkins; his soft, sleek breast, as silken as one of them, glistening in the sunshine, and almost seeming to equal it in beauty. Now he picks a grub from the bark, now chases an insect through the green-leaved boughs, alternately appearing and disappearing amongst the fresh, young foliage; and now, as if his exertions were no labour, but a most pleasant pastime, he gives forth a song so loud and wild, and withal so musical in its tone, that in rivalry other birds awaken their songs too, and seem to emulate his music.

His arrival in this neighbourhood (Melbourne) is scarcely ever later than the end of the second week in April. In the years 1840, 41, 42 and 43, it occurred on the 10th, 9th, 12th and 12th of that month; and he departs somewhere about the 9th or 12th of September. He dwells chiefly apart from villages, except where orchards and high trees abound, and prefers meadows and low grounds, intersected with

* Being extracts from 'Melbournia Manuscripta,' in possession of the author.

streams and water-courses, which give birth to numerous osiers, willows and alders, upon which trees he is most frequently met with. His food appears to consist principally of small insects, which are found enrolled within the opening buds of different forest trees, and perhaps sometimes of the tender leaves themselves. Like the wood warbler (*Sylvia sylvicola*) it builds a domed nest on the ground, near a dyke or hedge-bank, generally beside a stream where willows are thickly scattered, or on the outskirts of an orchard, where food may be easily obtained. A small round hole is left for the bird to enter the nest, and it is composed of dried grasses, lined with feathers, which render it beautifully soft and warm for the young brood. The eggs are of a delicate rosy white, dotted all over with minute spots of light red. The young leave the nest about the end of May, or the beginning of June, and the parents and family keep together for some time afterwards, visiting localities wherever insects abound. They devour numbers of young green grubs and caterpillars, and appear particularly partial to flies which infest roses and garden flowers, relieving them of myriads.

Wood-warbler (*Sylvia sylvicola*). The wood-warbler, resembling in many particulars, in its habits and manners, the willow-warbler (*Sylvia Trochilus*) and the chiff-chaff (*S. hippolaïs*), is now proved to be a distinct bird, indeed we include both species in our 'Fauna Melbourniensis.' He prefers an open and champaign country, dotted at intervals with small knolls and diversified with hedge-row timber. Tall isolated trees are his favourite haunts, especially the oak and elm, the tops of which he delights to frequent; and he generally appears just as the latter is opening into blossom. His song is always given from some elevated object, beginning in a loud clear voice, which gradually lowers in tone to its close. He arrives in this neighbourhood about the 16th or 17th of April, but in 1843 he reached us by the 12th, during a N.E. wind, and in very early seasons I have heard him by the 9th. On his first arrival he frequents the copses and plantations at some distance from the village, appearing to prefer the outer branches of the oak, willow or hawthorn, and there, hopping nimbly from spray to spray, he may be seen performing many nimble evolutions, as he examines, with the minuteness of the titmice, the partly expanded bud, accompanying his operations with a full, loud, clear song, of "*twee*," "*twee*," uttered many times in succession, which is in unison with the season, and particularly fresh and delightful. The nest is commenced the first week in May: it is placed on the ground, in a tuft of coarse

grass, which it resembles in appearance, being lined with a profusion of poultry-feathers, and is a most warm and comfortable little structure. The bird lays from six to eight eggs, of a delicate rosy white, spotted very thickly with dusky red spots. I have seen the nest lined with long dark hairs, and also with the seed-branches of field-grasses, but such is not commonly the case. It should be noted that this beautiful little warbler gives forth his fresh notes during all the vernal months, but is mute about July 12; his song gradually decreases in power and melody towards Midsummer, and then dies away.

He may be noticed, after spring, about orchards, searching for grubs and caterpillars, and small insects, amongst the fruits and leaves, and no doubt renders considerable service to the horticulturist. Indeed the number of destructive insects consumed during the breeding season by all birds is truly surprising, and it has been ascertained by accurate observation, that all birds do more good than harm, by the innumerable quantities they destroy, and ought not, on that account, to be molested in flower or fruit garden. J. J. Briggs.

King's Newton, Melbourne,
July 28, 1843.

Notes on the Migrations of Birds. By W. R. Hall Jordan, Esq.

The swallow tribe, and some other birds of passage, possess such ample powers of flight, that their migration from one country to another cannot occasion much surprise; but with the warblers the case is totally different; their general habits, — flitting from bush to bush, or skulking beneath the covert of a hedge, seldom displaying any more vigorous effort than that of hovering round the branch of a tree, — seem quite to preclude the idea of their being capable of undertaking long and difficult excursions on the wing. But on looking at a map of the Mediterranean sea, dotted with islands throughout its whole extent, we shall perceive that no very prolonged flight is necessary, and that there is no lack of resting-places, where the way-worn travellers may recruit themselves awhile after their harassing journey, and again, with renewed strength, resume their flight to the clime appointed for them.

Accordingly, from the testimony of many scientific and accurate observers, we shall find that these islands are selected as resting-places, by the various groups of feathered emigrants, whose course leads them in that direction; and also, that the times when they make a

temporary abode of these islands, coincide with the periods in which they arrive at, or depart from, more northern climes.

Sonnini, a French naturalist, who resided for some time in Egypt and the Levant, and who seems to have paid some attention to the subject of migration, speaks decidedly with regard to the temporary stay made by some of our summer visitants in the Greek islands, at such times. In his 'Travels in Greece and Turkey' (ii. c. 30), he says,—"The flycatcher (*Muscicapa grisola*) makes its appearance in the Greek islands of the Archipelago, about the middle of August." And again,—"The bee-eaters make their appearance in Autumn, and repass in spring:" the same is said of the cuckoo and the wheatear.

"The oriole arrives in the beginning of August, feeding on figs, and is called by the Greeks *Sycophagos*. The passage of the orioles scarcely lasts till the month of September; the greater part proceed to Lower Egypt, where they in like manner seek fig-trees as well as mulberry-trees, but they stay little more than a fortnight in this part of Egypt, and then pursue their route towards the East, in order to find there a suitable climate and an abundance of food."

"Turtle-doves appear in the Archipelago in spring, for about twenty days; towards the end of August they return."

"The end of March and the beginning of August are the two epochs of passage of the hoopoe." "Nightingales are seen sometimes, but rather seldom, to pass into the same islands, at the end of summer; it appears that their route is directed more to the south. They merely pass through the Greek islands."

"Quails are commonly seen to pass into the islands of the Levant which happen to lie in their route, on the 20th of August, and to repass them on the 20th of April, in order to return to our climates; some remain, or some are passing during the whole of September."

With regard to irregularity in this periodical appearance, Sonnini says:—"The period of the passage of birds into the islands of Greece varies according to the winds which then prevail. At the end of the summer of 1779 this passage was delayed, because the *northerly* winds which are accustomed to reign during that season, blew much later than in other years, and the birds which then go to the south, were obliged to wait for a wind that might favour them in their passage, accordingly the period of their passing was of shorter duration that year; the birds, eager to arrive in countries, where they were to find warmth of temperature and abundance of food, hastened to repair thither as soon as the favourable wind had sprung up."

Again, he says:—"On the 17th of March, I saw for the first time

in 1780, the swallow make its appearance at Argentiera. The wind had been several days to the north-east, but in the night it had shifted to the west, the sky was serene and the sun hot."

"Becaficos arrive in September. The island of Malta is a resting-place for these little birds, as well as for other species, such as quails, &c. Their passage into that island is suspended when the west and north-west winds blow, and they arrive there only with those from the east and south-east."

Mr. Swainson, in the preface to his 'Birds of Western Africa,' tells us, "that the island of Sicily, during the spring and autumnal migrations, may be considered like a vast preserve of quails and numerous other migratory birds."

However, it would appear that the warblers do possess much greater powers of flight than are commonly attributed to them. A remarkable instance of this is given by the Prince of Musignano, Charles Lucien Bonaparte. "A few days ago," says he, "being five hundred miles from the coasts of Portugal, four hundred from those of Africa, we were agreeably surprised by the appearance of a few swallows (*Hirundo urbica* and *rustica*). This, however extraordinary, might have been explained by an easterly gale, which might have cut off migrating from the main to Madeira, only two hundred miles distant from us; but what was my surprise in observing several small warblers hopping about the deck and rigging. These poor little strangers, exhausted as they were, were soon caught and brought to me. The following is a list of the species: — 1. Sylvia Trochilus. 2. S. Erithacus, *Lath.* (Tithys, *Temm.*) 3. S. Suecica, or rather a similar species which I have already received from Egypt and Barbary. 4. A species of Anthus."—'On board the Delaware, March 20.'* See also 'The Zoologist,' (Zool. 15) for some interesting observations by Mr. Hewitson.

I have even heard of the death's-head hawk-moth, whose capability of flight is much more questionable, flying on board ship at a considerable distance from land.

W. R. Hall Jordan.

17, South Parade, Fulham Road,
August 3, 1843.

Note on the Hooded Crow's breeding in Norfolk. Having observed for several years that a few of the hooded crows, which abound here during the winter season, still linger about the sea-shore, some time after the great bulk of them have disappeared, I watched them last spring as closely as possible, in the hope of finding that one or two

* Time's Telescope for 1834, p. 129.

pairs remained for the purpose of breeding. On the 4th of April I saw a flock of these birds, for the last time, which then appeared to be in the midst of one of those consultations, if they may be so called, which have so often been observed to take place among members of the Corvus tribe. After that day, only a few scattered individuals were seen till about the 26th, when I lost sight of them, and my attention being directed to something else, the subject almost escaped my memory. On the 20th of this month, however, I was rather surprised by seeing three of these crows feeding in the marshes about two miles from Yarmouth, and judging from its small size, and the apparent imperfection of its quill feathers, I strongly suspect that one of them was a young bird. I have since tried, but unsuccessfully, to get a shot at them. I find they have been seen for some time by several of the gunners who frequent the marshes, but not being aware of their rarity at this time of the year, they took little notice of them.—*William R. Fisher; Great Yarmouth, July* 25, 1843.

Note on the Pigmy Curlew and Dunlin. A specimen of the pigmy curlew was brought me yesterday morning; it is beginning to assume the winter plumage, the breast being covered with patches of white mixed with the red tint of summer. A strong breeze from the N.W. has also brought a number of dunlins, which have already lost all vestige of their summer plumage, the breast and belly being now quite white: or perhaps the birds of which the flock is composed, are the young of the year, which have never assumed the dress that distinguishes the old birds during the breeding season.—*Id.*

Note on the occurrence of the Lark Bunting near Milnthorpe. I am glad to have it in my power to record the capture of a fine specimen of the lark bunting (*Plectrophanes lapponica*) near this place, about ten days ago. This very scarce bird was brought me by a *professional* bird-catcher, who, though he was evidently aware he had fallen in with a *rara avis*, knew nothing more about it than that it was a bird he had never seen before. He described it as having been very wary, and difficult of approach, but after a whole day spent in the attempt, was enticed into a trap cage. It is at present in very good health, *apparently* happy, and enjoying partial liberty in a large aviary, where many other former denizens of the air are provided with comfortable board and lodging, and abundance of sunshine and shade, as necessity or inclination may dictate. The bird in question exhibits the sombre plumage of the female, as described by Selby and Yarrell; but should it ultimately assume the more varied garb of the male, I shall only be too happy to record it in the pages of 'The Zoologist.' Confined in the same aviary I possess a very beautiful specimen of the snow bunting (*P. nivalis*), which (with another of the same species) was captured in the neighbourhood of Kendal during the last winter. This fellow also seems quite reconciled to his situation, and, as escape is hopeless, makes the best of it, like a philosopher, and takes his daily meals of rape, canary or hemp seed, and now and then a sprinkling of oats, with apparent satisfaction. I have reason to believe that this bird also is a female. It may be that partial domestication has, in some degree, changed its habits, or perchance, like many individuals of a higher grade, it has conformed to those of the society in which it lives, for, contrary to what has been recorded of this bird in a state of nature, it seems to prefer a high and slender twig to perch upon, either to the ground, or some stronger poles that were originally designed for silver pheasants. Both the birds above mentioned are strong and powerful, very lively in their habits, and most amicably disposed towards each other, and the rest of the feathered tribe around them.—*S. H. Haslam; Greenside Cottage, Milnthorpe, July* 8, 1843.

Note on the occurrence of the red-winged Icterus near Norwich. On the 2nd of June a specimen of the red-winged Icterus of North America (*Icterus phœniceus*, Audubon), was brought into this city in the flesh, having been shot near one of the broads or large pieces of water which are common in this county, at a distance of about twelve miles to the north-east of this place. The bird was a male, in the plumage of the second year, and apparently approaching the period of another moult. It was in good condition,—its stomach filled with the remains of Coleopterous insects,—and its plumage free from any marks of having been kept in confinement. Should this really be a wild specimen, I believe it will be the first on record as having been captured in the British islands.—*J. H. Gurney; Norwich, August* 17, 1843.

Notes upon the Reptiles mentioned in Shakspeare's Plays.

By Robert Patterson, Esq., V.P. Nat. Hist. Soc. Belfast.

(Continued from page 253).

Of the true saurians or lizards but one species has as yet been recognized in Ireland: it is the smaller and more abundant of the two known as British, and is distinguished by the name *Zootoca vivipara*. It brings forth its young alive, or, to speak more correctly, it is ovoviviparous. The larger species, to which the name *Lacerta agilis* is now restricted, is, on the contrary, oviparous. This distinction is one of great interest to the erpetologist; but there is another point better known, and more often marvelled at — the facility with which the tail separates from the body. Great is the astonishment of a person unacquainted with this peculiarity, when he grasps the tail, and finds it remaining in his hand, while the swift-running reptile effects its escape.

The lizard presents itself to our eyes decked in bright colours, possessed of the power of rapid and graceful movements, and associated with the season when

> "Summer birds sing welcome as ye pass."

We know from observation that its food is insects, and that its habits are perfectly innocuous to man: but such were not the opinions respecting it in Shakspeare's time: it was then a creature to be shunned, and one that, by common report, was furnished with a formidable sting. The bad repute in which the creature was held is evinced by the "lizard's leg" being one of the "ingredients" in the witches' cauldron. The sting itself is mentioned in the curses of Suffolk on his enemies.

> "Their softest touch as smart as lizards' stings."
> *2nd part K. Henry* VI. *Act* iii *Scene* iii

And in the words which Queen Margaret addresses to Richard.

> " But thou ———
> Mark'd by the destinies to be avoided,
> As venom'd toads, or lizards' dreadful stings."
> *3rd part K. Henry* VI. *Act* ii. *Scene* ii.

When a creature so harmless has been pourtrayed in aspects so repulsive, we may well exclaim, " O thou monster Ignorance, how deformed dost thou look ! "

I now pass on to another reptile, equally inoffensive and not less maligned, the blind-worm or slow-worm of Britain, described as " the eyeless venom'd worm " by Shakspeare. In Ireland it is unknown, but in Scotland I have seen it broken in two by the blow of a slight rod, thus illustrating the correctness of the Linnæan appellation, — *Anguis fragilis.* The " blind worm's sting " is enumerated among the materials employed by the witches " for a charm of powerful trouble," yet it has in fact no poison fangs, and is naturally of so timid and gentle a disposition, that only under circumstances of great provocation will it attempt to bite.

It is obvious, therefore, that in giving utterance to the erroneous ideas of his own times respecting the blind-worm, Shakspeare has inadvertently been instrumental in " filching from it its good name." Perhaps he has afforded some compensation for the wrong by introducing it—though still as a forbidden thing—into the charmed lullaby which the fairy, in the Midsummer Night's Dream, sings at the behest of Titania.

> " You spotted snakes, with double tongue,
> Thorny hedge-hogs be not seen;
> Newts and blind-worms do no wrong,
> Come not near our fairy queen."

To the systematic naturalist this creature becomes interesting, from considerations of a different kind. The body is destitute of legs, in that respect resembling the true serpents, while at the same time the jaws and cranium are consolidated, thus resembling those of the lizards. Both the saurian and the ophidian reptiles might therefore claim its allegiance, and it would seem to owe " here a divided duty." But all difficulties vanish if we regard it not as tributary to either, but as a member of a connecting group, for which Mr. Gray has proposed the expressive appellation of Saurophidia.

Of the true serpents (*Ophidia*), we have had no representative in Ireland since that memorable traditionary epoch when St. Patrick

"banished all the varmint." In Britain there are two species: one of these, the common snake (*Natrix torquata*), is harmless, and may rank as the representative of the numerous individuals of other countries, which are innocuous (*Colubridæ*): the other, the common viper, (*Pelius Berus*), may with equal justice stand forth as the representative of the poisonous groups (*Viperidæ*). The common belief of Shakspeare's time regarded both species as dangerous: hence we are prepared to expect that his notice of either of them would be in accordance with the popular, though erroneous, opinion. And accordingly we find that, wherever a serpent is mentioned by him, it is as a thing to be shunned as hateful or venomous. Thus King John, in speaking of Prince Arthur, remarks,—

> "He is a very serpent in my way;
> And wheresoe'er this foot of mine doth tread,
> He lies before me."
>
> *Act* iii. *Scene* iii.

Lear, in telling of the wrongs he has sustained from Goneril, says—

> "She has abated me of half my train;
> Looked black upon me; struck me with her tongue,
> Most serpent-like, upon the very heart."
>
> *Act* ii. *Scene* iv.

In the brief dialogue between Marcus and Aufidius, prior to their combat in the battle-field at Corioli, we find the expression—

> "Not Afric owns a serpent I abhor
> More than thy fame and envy."
>
> *Coriolanus*, *Act* i. *Scene* viii.

These passages from Shakspeare are sufficient to show that a harmless snake was a phenomenon not "dreamed of in his philosophy." In a similar manner Macbeth applies the word "serpent" to the slain Banquo, while Fleance, as the young of the serpent, is designated "worm."

> "There the grown serpent lies: the worm that's fled
> Hath nature that in time will venom breed.
> No teeth for the present."
>
> *Act* ii. *Scene* iv.

The word "worm" is not invariably used by Shakspeare in this sense, neither is it confined to the common earth-worm (*Lumbricus terrestris*), to which Romeo most probably refers when, in his last heart-broken accents to the sleeping Juliet, he exclaims—

———" here, here will I remain,
With worms that are thy chambermaids."

The word is most usually employed to denote the larva of some species of insect. Thus when Hamlet, after speaking of the "convocation of politic worms," says "your worm is your only emperor for diet: we fat all creatures else to fat us, and we fat ourselves for maggots;" we perceive at once that the words "worm" and "maggots" apply to one and the same thing, namely, the larvæ of the flesh-flies. Every one will call to mind another example, in the celebrated scene where Othello demands "the handkerchief."

"The worms were hallowed that did breed the silk."

In other instances, however, the word is applied either to the serpent, or to some species of venomous reptile.

"Were there a serpent seen with forked tongue,
That slily glided towards your majesty,
It were but necessary you were wak'd,
Lest, being suffered in that harmful slumber,
The mortal worm might make the sleep eternal."
2nd part K. Henry VI. *Act* iii. *Scene* ii.

Again, when Hermia, in the Midsummer Night's Dream, reproaches Demetrius for the supposed murder of Lysander, she asks—

"And hast thou killed him sleeping? O brave touch!
Could not a worm, an adder do so much?
An adder did it; for with doubler tongue
Than thine, thou serpent, never adder stung."
Act iii. *Scene* ii.

Cleopatra employs the word to designate the asp, for she enquires of the countryman who had brought it—

"Hast thou the pretty worm of Nilus there,
That kills and pains not?"
Act v. *Scene* ii.

On one occasion the peculiar malignity of the "worm" is indicated by the term "viperous."

"Civil dissension is a viperous worm
That gnaws the bowels of the Commonwealth."
1*st part K. Henry* VI. *Act* iii. *Scene* ii.

ROBERT PATTERSON.

3, College Square North, Belfast.

(To be continued).

Notes on a species of Toad. The annexed is copied from a diary kept in Dorsetshire, near Poole, on the coast, and communicated to me as follows. "My attention some years back (1826) was attracted in the month of March, and again in autumn, to the migration of a numerous army of a species of toad (which I believe to be distinct and not yet described) from their hibernal quarters to their breeding localities. Their course lay across a heath and moor, and could be traced by the fragments of their bodies left by the rats and birds of prey, which molested them on their route. The distance was two miles, and there was no pond nearer, except such as were subject to be dried up. They travelled in a direct line. These annual migrations continued until 1835, when, having purchased a portion of the heath and bog, I cut a canal through the latter from the sea across their line of march. In crossing this canal in the spring I found large quantities of toads dead in it, probably from the effects of the salt water, for I afterwards found by experiment that they lived but a very short time in sea-water: many more died on their return, and they never attempted the journey after I accidentally discovered their winter quarters, which were in an old sand-pit. On looking into this pit one day in the early part of November, I was surprised to see a number of toads, and a vast quantity of loose sand in motion. On turning it over with a spade, I found numbers of toads working themselves further into it. The sand in its natural bed is replete with thin laminæ of hardened sand. I observed several of the larger toads climbing the perpendicular side of the sand-pit by clinging to these laminæ by their claws, some to the height of three feet from the bottom. When they found two laminæ sufficiently wide apart to suit their purpose, which they appear to determine by feeling with their fore legs, they proceeded to rake out the soft sand with one hand, while they held on by the other, relieving themselves by changing hands: in this way they soon effected a lodgement, and then rapidly worked in out of sight, turning the sand they excavated behind them, and thus burying themselves to the depth of eighteen inches from the face. In the spring they came out, leaving their holes open, which were taken possession of by the martins (*Hirundo riparia*). Next year the sand-pit was filled up, and I do not know where their winter quarters now are. Being obliged to abandon their summer quarters in consequence of the obstruction by the canal, they located themselves in two pools, both subject to dry up, within two hundred yards of their winter quarters, and near to my house, which they still frequent, though they have changed their winter haunts, and I have had an opportunity of repeatedly observing them. I always kept a sharp look out for my old friends, the toads, and was much pleased, on Sunday morning, the 26th of January, 1840, as I returned from church past one of the pools, at 1 o'clock, P.M., the sun shining most beautifully, to see the whole surface studded with their brilliant gold-encircled eyes: they were not in sight when I passed three hours before. I looked attentively at them for five minutes, when, making a little noise with my stick, they all disappeared as if by magic. Not a particle of spawn was to be seen. From this time I visited them daily; on the following day, the 27th, a quantity of spawn was floating on the water, and not many toads were to be seen: by the 30th not a toad was visible in the pond. On the 18th of February, the first young tadpoles made their appearance, it was a very cold easterly wind: on the 19th, weather the same, many more tadpoles were to be seen. The weather, which, previously to the 17th, had been warm, with wind at south west, now became exceedingly cold, and the wind north east. On the 20th, the tadpoles became torpid; ice was the eighth of an inch thick over the spawn that had not vivified, but on no other part of the pool, nor over the tadpoles. 21st, pool frozen

completely over, the tadpoles retired under the spawn left. 22nd and 23rd the same, but at 12 o'clock, the sun being very powerful, it thawed a little, producing small pin-holes in the ice over the tadpoles. 24th, ice rotten and porous over the centre of the spawn, where the tadpoles were. 25th, a thaw, over the tadpoles and spawn thawed first. 26th and 27th, frost, all torpid. 28th, thaw, all alive and pushing out the branchiæ; these were not visible when the tadpoles were first hatched, or before this day. The centre of each large piece of spawn was hatched first, and to-day all the edges, except some small pieces that perished, were hatched, and by 3 o'clock P.M. all the tadpoles hatched on the 18th, since, and to-day, were of the same size and in the same state. 29th, fine, tadpoles lively and growing. March 1st, pool frozen all over, and tadpoles torpid. 2nd, frozen, with air-holes over the tadpoles, all torpid. 3rd, a thaw, tadpoles alive but weak, and much reduced in size from the 29th of February. 4th, 5th, 6th and 7th, frozen every night but thawed each day, tadpoles assumed a more mature structure but did not increase in size, they measured from seven to eleven sixteenths of an inch in length. 8th, frost at night, day very warm. 9th and 10th weather the same, tadpoles lively but not grown. From the 11th to the 15th inclusive weather temperate, wind north and north-west, tadpoles lively, but have evidently decreased in size. 16th and 17th weather the same, tadpoles continue to decrease in size, the branchiæ have disappeared. 19th, 20th and 21st, weather a little warmer, tadpoles recovered their growth a little. 22nd, frost at night, hail and snow, 23rd and 24th, weather the same, tadpoles much smaller. 25th, three parts of the tadpoles dead, the rest very weak and small, hard frost last night, hail and snow to-day. 26th, hard frost and deep snow, not more than five hundred tadpoles alive, and those weak and small. 27th, 28th and 29th, weather and tadpoles remain the same. 30th, change of weather, wind south-south-west, only about fifty tadpoles alive, no others to be seen. 31st, the same. April 1st, tadpoles alive, but very small, not exceeding seven tenths of an inch in length. 2nd to the 5th, tadpoles stationary as to size, the weather continuing dry, dried up the pool, numbers of dead tadpoles consumed by the birds. 6th and 7th, some few continued to struggle in the mud, which at last became quite dry, and all the tadpoles were destroyed by the birds.—*Wm. Thompson; London, July* 14, 1843.

Note on the Poaching propensities of Snakes and Adders. I am not aware if it is generally known that the common snake and the adder are both very destructive to young pheasants and partridges. A large adder was killed last year by a gamekeeper, which, upon being opened, was found to contain two young partridges. I have heard of one or two other instances of the kind, in which the common snake was the culprit. This is a fact worthy of notice to those who preserve game. — *L. Pemberton Bartlett; Kingston, near Canterbury, July* 27, 1843.

Note on the fact of certain Fishes remaining stationary in size. Mr. Jesse, in his 'Gleanings,' mentions that in some waters perch remain stationary in size. Rather more than thirty years ago I was acquainted with three ponds near Lynn, in Norfolk, only a few yards distant from each other, one of which, I think the largest, abounded in tench, not exceeding three or four inches in length, whereas in the other ponds the fish were of the usual size. If I tried, I never caught any of the small tench, but they were constantly to be seen swimming about the pond. My idea that the one

pond contained only very small fish was confirmed, if I recollect right, by brother anglers, who also informed me that another pond in the neighbourhood was similarly stocked, and that those pigmy tench, though they never increased in bulk in their native waters, yet did so if removed to another pond. — *Arthur Hussey; Rottingdeane, Sussex, August* 7, 1843.

Note on the Voracity of the Eel. A correspondent of 'The Zoologist' relates an instance he witnessed of the voracity of the eel (Zool. 108), which is somewhat similar to an occurrence I beheld many years ago. On a visit to the well-known Sussex ruin, Bodiam castle, one of my brothers and myself, looking rather suddenly out of a large window upon the moat, disturbed a water-hen, which dived instantly, when it was seized by an eel, and never rose again. The water not being perfectly clear, I could not distinctly observe the struggle, but it appeared as if the fish wound itself round the bird, so as to confine its energies, somewhat in the manner of the boa constrictor. The eel must have been large, as the water-hen was an old one. Most deep-water anglers, when fishing for something else, must have been tormented by catching an eel, which usually swallows the hook very deep, and by writhing and twisting ties the line into knots, and very probably breaks it. Under such circumstances I learned to save my tackle by immediately pressing one foot hard upon the fish, while with a knife I divided the spine close to the head, which completely kills the eel, though all motion does not instantly cease. A little salt put into the eel's mouth also causes immediate death.—*Id.*

Notes on the capture of large Fishes on the Trent, near Melbourne, Derbyshire. At the northern extremity of Donnington park is a beautifully wooded eminence, overhanging the bosom of the Trent, called Donnington cliff, immediately below which stands a building of rather ornamental character, now used as a paper-mill, but which is somewhat celebrated as having been a strongly fortified place of the royalists during the civil wars. The dam and weir belonging to the mill are the resort of fishes of almost every description. Eels, perch and pike are frequently taken here, and salmon may be oftentimes seen leaping and sporting up the weir. Amongst five of the latter caught there on the night of the 23rd of July, 1842, was a remarkably fine one, weighing upwards of 25 lbs., being, we believe, the finest one taken near the spot. King's mills has long been a favourite locality with the sturgeon (*Acipenser Sturio*), and several individuals of formidable size have occasionally been captured in its vicinity, from the time of King John to the present. In the 'Annals of Burton Monastery,' a curious old record of monkish and ecclesiastical life, is the following quaint memorandum. "1225. In this same yeare, in the waters of ye Trent near Donnington Castle, about ye time of ye Assension of our Lord, there was taken a fish called a Sturgeon, the old people of those parts then affirming that a similar fish was taken in the same place the very yeare before King John was crowned." Stebbing Shaw, the historian of Staffordshire, asserts that one was caught at King's mills in 1791, seven feet long; and in the year 1838, another was taken in the nets there of very considerable magnitude, but its exact dimensions we have never been able to ascertain, but we have heard its length stated to be upwards of 8 feet. — *J. J. Briggs; Melbourne, Derbyshire, September*, 1843.

On the Minute Anatomy of the Horse-Leech, Hirudo sanguisorba, (Sav.), *H. vorax* (Johnst.) By JOHN QUEKETT, Esq., M.R.C.S.L.

(Continued from p. 94).

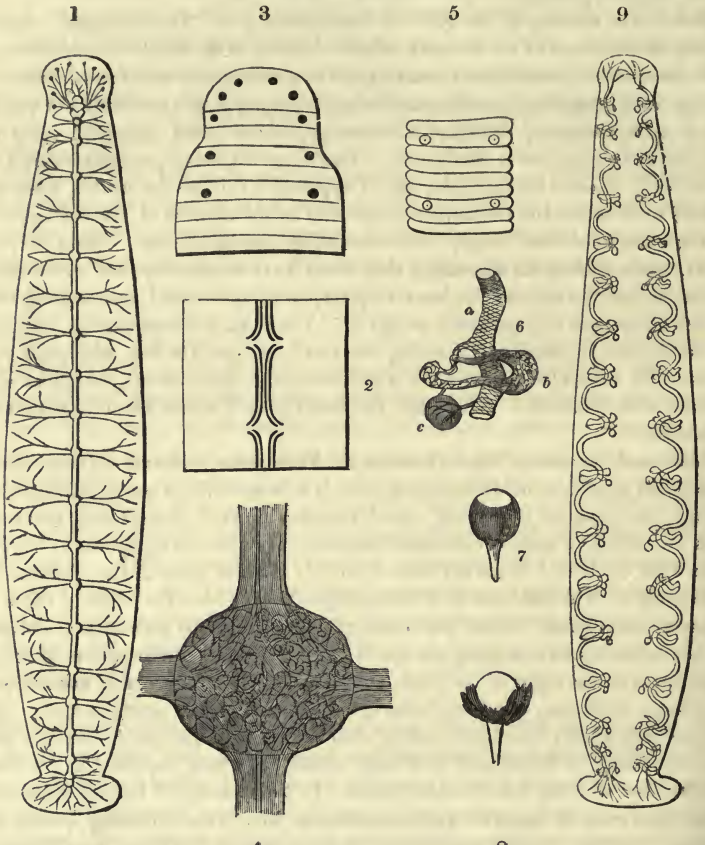


Fig. 1. Nervous system of Horse-leech. The first incrassated portion of the nervous cord represents the brain, the rest ganglionic enlargements. Fig. 2. Plan of ventral blood-vessel according to Dr. Rawlins Johnston. The outer black line represents the ventral vessel; the inner line the nervous cord enclosed in it. Fig. 3. Head of the horse-leech, showing the arrangement of the eyes. Fig. 4. Nervous ganglion magnified 200 diameters. Fig. 5. Portion of integument of abdomen, showing four openings of the mucous vesicles. Fig. 6. Magnified view of Respiratory Apparatus. *a*. lateral vessels. *b*. loop-shaped gland. *c*. mucous vesicle. Fig. 7. Eye with choroid coat entire. Fig. 8. Eye with choroid coat partly removed. Fig. 9. Respiratory system of the Horse-leech.

THE *venous system* of the horse-leech is represented by two vessels with their communicating branches, one situated on the dorsal, the other on the ventral aspect of the body. They are both much smaller than the lateral vessels which have been previously described; and

from being so mixed up with the dark pigment, they cannot be very readily made out: this is more particularly true as regards the trunk situated on the dorsal surface, the one on the ventral surface, from its being intimately connected with the nervous cord, is very readily distinguished. The *dorsal vessel*, which it will be necessary first to describe, extends from the head to the tail, along the middle line of the back, being very much obscured by pigment and cellular tissue. It is about $\frac{1}{50}$ of an inch in diameter, and appears as a black line running down the middle of the body. It receives the blood from the lateral vessels by branches named dorso-lateral, and communicates freely with the branches of the abdominal vessel; about the posterior third of the body it also receives a large branch, which comes off from the intestines; this branch runs parallel with the main trunk, which then proceeds to the head, where it receives numerous branches from the œsophagus and parts around the mouth. In the whole of its course it receives a pair of branches at each segment of the body, which correspond in arrangement with the branches of the abdominal or ventral vessels.

The *ventral vessel* accompanies the nervous cord in nearly the whole of its course. It commences at the head, where it receives numerous branches from the sucking disk, and from the œsophagus and œsophageal nervous ganglion or brain; it also receives branches on each side of the body, at those parts where the nervous chord forms a ganglion; these branches accompany the nerves coming off from the ganglia, and so close is the analogy in the arrangement between the vessels and nerves, that many authors have confounded the two, some describing it as a blood-vessel, and others as the nervous cord. Dr. Rawlins Johnston* appears to have been the first to notice the ventral vessel. He describes it in the medicinal leech as a pulsating vessel, and as forming expansions in its course, where it assumes the figure of a diamond. According to this view of the subject, these expansions must correspond with the nervous ganglia; he mentions in his description of the nervous system of the same animal, that the nerve has diamond-shaped expansions, which correspond with those of the blood-vessel; or in other words, that this vessel forms a sheath for the nervous cord, (fig. 2). This opinion has been followed by Brandt and many other authors, all of whom state that the nervous cord is being continually bathed in the venous blood. Some authors make allusion to the nervous cord, and have overlooked the blood-

* Treatise on the Medicinal Leech, p. 115.

vessel, and others have described it as merely a sheath for the nerve; and even at the present day anatomists are not agreed on this point. Knowing the discrepancies in their opinions, I have been induced to pay particular attention to this part of the anatomy of the horse-leech, and to that of a few others of the class Annelida as well, and my examinations lead me to maintain a different opinion from any of the authorities above alluded to. I cannot satisfy myself that there is a pulsating vessel surrounding the cord, as Dr. Rawlins Johnson directly asserts, either in the horse-leech, or in the medicinal species, which has enlargements at every spot corresponding with each ganglion of the nervous cord. And although I have killed individuals of both species, by means of alcohol, both before and after the integument has been removed, I have not been able as yet to make out this point to my satisfaction; but I find that the nervous cord is enveloped in a strong sheath, and in this sheath the blood-vessel appears to run, and it requires some little care not to confound one with the other. This agrees with observations which have been made by my friend Mr. Goadby, in his beautiful dissections of the nervous system of the king crab, (*Limulus Polyphemus*). In this animal it was extremely difficult to distinguish nerves from blood-vessels; but by filling the vessels with a mixture of size and vermilion, by means of a syringe, the difference between the two was rendered very manifest.

In the earth-worm I have carefully examined the nervous cord, and find an appearance as if there were two blood-vessels, one on each side of the cord, with a transverse connecting vessel every here and there, and in some places there appears to be a vessel in the middle, between the two component columns of the cord; and as the nerves are given off from the ganglia, a vessel runs between them for some distance. The examination of the nervous cord of a leech, *in situ*, with a pocket lens, shows two black lines, one on each side of the cord, which look like blood-vessels; but I have frequently placed a small instrument underneath the cord, and lifted it up, viewing it at the same time with a lens, so as to be able to see if the blood would dilate the sinus around any of the ganglia, but such has not been the case. Portions of the cord cut off, dried, and mounted in Canada balsam, present an appearance of a blood-vessel on each side; but such appearance I consider due to the gravitation of the blood to the sides of the vessel in drying.

In addition to the general circulation in four trunks, as just alluded to, there has been described by some authors a lesser circulation, as

occurring in the medicinal leech.* This is made out in the following way. Those parts of the glandular system which will be described as the loop-shaped glands, are considered to be blood-vessels coming off from the lateral trunks; these carry the blood to the walls of the mucous sacs, where it is brought into contact with the aërated water contained in the sacs, and from which it is again conveyed to the lateral trunk by means of a small communicating vein.

Sensation. — Of the five senses which are common to animals of the higher classes, that of sight is the most perfect in the horse-leech. The eyes of this creature are ten in number, and are placed on the dorsal surface of the anterior sucker, (fig. 3): six of them are arranged in a curved form near the margin of the disk, three on each side of the median line, with a slight space between them; behind these, and at a little distance, we have two others, and at a still greater distance of a line and a half, are the remaining two, which are much larger than any of the preceding. They are hardly perceptible to the naked eye, but when examined microscopically with a low power, they appear as so many black dots, and with a power of 100 linear the anterior part of the eye is seen not to be black, but transparent; the posterior part is covered with a black pigment, which corresponds to the choroid in the eyes of other animals (fig. 7, 8). The optic nerve enters at the back, and the whole globe of the eye seems to be nothing more than the dilated or bulbous extremity of the optic nerve. Müller, who has examined the eyes of the Annelida with the greatest care, finds some of them to be spherical, but in the leech tribe they appear to be rather of an oval figure. The sense of touch is likewise present to a considerable extent in these animals; but they appear to be quite deficient in that of hearing.

Nervous System.—The nervous system (as in the other members of the class Annelida), may be said to consist of a bilobed ganglion or brain, situate near the head, and a cord composed of two columns, which extends from the brain to the caudal extremity, all lying on the abdominal surface of the body, upon the alimentary canal (fig. 1). The brain is situated about two lines from the mouth, its anterior portion being circular, whilst its posterior is more of a triangular figure; both are firmly imbedded in the thick muscular tissue appended to the mouth

* Moquin Tandon, 'Monographie de la Famille des Hirudinèes.' Dugès, 'Annales des Sciences Naturelles,' tome xv.

and sucking-disk, so that the dissection of this part of the nervous system is rendered rather more troublesome than that of any other of the ganglionic masses. The brain gives off numerous branches to the integument and sucking-disk, and ten very minute yet distinct nerves to supply the eyes or ocelli, ten of which may be seen as little black dots around the anterior and upper margin of the mouth, with a pocket lens.* From the brain two cords are continued, which soon unite and form the œsophageal ganglion, from which numerous branches are given off to the muscles about the mouth, and likewise to those which are attached to the three cartilaginous jaws. From this ganglion two cords extend backwards to the tail; to the unassisted eye, from their being so closely approximated, these two cords appear as one, but by the microscope they will be rendered quite distinct. The cords are enveloped in a strong sheath, containing much black pigment, which prevents the white characteristic nervous structure from being seen. At nearly equal distances in their course backwards, a ganglionic enlargement takes place, from which a pair of nerves are sent off on each side to supply the neighbouring parts. One of these ganglionic enlargements is represented at fig. 4, magnified about 200 diameters. When the upper surface of the ganglion is in focus, you have an appearance of striæ, which are the fibres connecting the nerves of one side with those of the other; by altering the focus so as to get the next layer into view, a number of small cells will be made evident around the margin, each one having a nucleus, and more towards the centre three or four larger cells may be seen, of an elongated oval figure, also with nuclei, and with these the nervous fibres appear to be connected. Ehrenberg, in his work on the structure of nerves, has represented a ganglion of the medicinal leech; it appears to be precisely similar to that of the horse-leech, except in size. Of these ganglia I cannot make out more than nineteen, exclusive of the first or œsophageal ganglion, which is the largest: twenty-one are generally given by authors as the number occurring in the medicinal species. As a general rule, a ganglion occurs at every fifth ring of the body; but some of them are much nearer together than others, for instance, the second ganglion from the œsophageal is much nearer to the first than any of the others until we come to the last two or three, which are placed near the anal outlet; the third, fourth, fifth and sixth are the widest apart; they then get more closely approximated

* See the upper extremity of fig. 1; the parts are represented on too small a scale to admit of a detailed reference.

as they approach the terminal sucking-disk. The fifth is situated on or near the male genital organ; the sixth is partly obscured by the uterus and ovaries of the female apparatus. At the tail there is a larger one, which gives off numerous branches to the prehensile disk.

Dr. Brandt has described in the medicinal leech a single filament which appears to be given off from the œsophageal ganglion, and runs along the dorsal surface of the body, and is distributed to the alimentary canal. This Mr. Owen regards as the first trace of a distinct system of nerves, usually called the stomato-gastric in Entomology, and to which our great sympathetic and nervus vagus seem answerable.* At present I have been unable to find such a nerve in the horse-leech.

Respiratory System.—The respiratory system of the leech tribe is, even at the present day, involved in considerable obscurity, notwithstanding the various opinions which have been offered on this subject: the chief points of dispute being, whether the function of respiration is carried on by the skin, or by an apparatus consisting of loop-shaped glands and receptacles, which pour out on the abdominal surface of the body an abundance of a mucus-like secretion. On each side of the animal (fig. 9), besides the genital organs and the lateral vessel, may be observed a row of small loop-shaped bodies, and a similar number of membranous sacs in the form of bladders connected with them, and containing in their interior a semi-fluid substance, which becomes more liquid after the death of the animal, and especially when slight decomposition has taken place. These bodies communicate each with a small short duct, which opens externally in the skin by a minute aperture, which may be seen with a pocket lens at every fifth ring, (fig. 5). These openings are rather difficult to discover at first, but when one has been seen the others can readily be made out, by counting the rings and looking at every fifth; or when the leech has been wiped dry by means of a cloth, and then examined, small drops of fluid will be found to issue from each of these pores. These bodies are much more evident in the medicinal leech than in the species under consideration, and they are at all times rather difficult to see, especially if the fluid they contain should have been suffered to escape. They are highly vascular, and on this account they have been supposed by some authors to be the respiratory organs, and the fluid they secrete has been said to be analogous to the pulmonary exhalation in the higher classes. Other observers assign to these

* Lectures on Comparative Anatomy, p. 142.

vesicles the office of secreting the mucus which abundantly lubricates the bodies of these animals, and also that of supplying the ova with their cocoon-like coverings during the breeding season.

The loop-shaped glands before spoken of, are about seventeen in number: they lie in the spaces between the sacculi of the stomach and intestine, and each one receives a large branch from the lateral vessel, which ramifies over the exterior and keeps it firmly adherent to the blood-vessel: a small slender duct of communication connects the gland to the mucous sacs, (fig. 6). The glands, in the medicinal leech, are much larger and much less convoluted than in this species; in both, with a high power, they may be seen to be lined with a thick coating of epithelium, and to be largely supplied with blood-vessels, which has led many anatomists to suppose that some other office, more important perhaps than that of the secretion of mucus, must belong to this apparatus; but the skin, as well as these glands, is liberally supplied with blood-vessels, so that the function of respiration would rather seem to be performed by both these systems of capillary vessels.

JOHN QUEKETT.

(To be continued).

Note on the occurrence of Colias Edusa in Devonshire. I have been chasing Colias Electra all the morning, but with no success, I am sorry to say. It is now half-past 11, A.M., and I have seen six specimens already this morning. They seem gifted with the speed of electricity or light at the least; I have almost given up all hopes of procuring any specimens. On the rugged cliffs of Teignmouth, whilst they are making a circuit round some bank, you can anticipate them by crossing it in a straight line; but here, on level ground, it seems impossible to catch them. They fly and you follow, but unless they settle, which is a forlorn hope indeed, I, at least, am soon completely distanced. However, it may not be without interest to the readers of 'The Zoologist,' to know that Colias Electra has been plentiful this year at Lympstone, Devonshire.—*Robert C. R. Jordan; Lympstone, Devon, September* 18, 1843.

Note on the occurrence of Colias Edusa, in Devonshire. On the 1st of September I was gratified by the sight of a splendid male Colias Edusa, which I did not expect. I had no net with me, or I might have caught it as it settled on a flower of Convolvulus sepium until I came up, but it was too cunning to allow itself to be taken by the hand.—*Id.*

Note on the occurrence of Colias Edusa in Sussex. I took a few specimens of this butterfly near Arundel, on the 20th of last month, and saw another a few days afterwards, but the heat was so great I was not inclined to chase him. I observed two specimens on the banks of the south-western railway, between Wandsworth and Wimbledon, about a fortnight since.—*Samuel Stevens;* 38, *King St., Covent Garden, September* 22, 1843.

Note on the occurrence of Colias Edusa in Leicestershire. Last Friday, the 29th of

September, a young entomological friend, son of the Rev. J. Goadby, took two males of Colias Edusa, in a lane close to this town. The capture of the insect in our inland county, in the present year, is very interesting, as an additional fact in support of a quadrennial theory started by Messrs. Jordan and Newman, (Zool. 176). The specimens are of a lighter colour than that usually ascribed to C. Edusa, but in other respects they more resemble that species than its near congener C. Philodice; and they are so beautifully and freshly coloured, as to leave no doubt of their being bred near the spot; thus discountenancing the opinion of sea-shore emigration. What surprises me most is the kind of weather they chose for their winged existence, so cold and winterly had been the preceding week; and that they had not appeared during the more genial weather before that, I am convinced, because I was myself at that time a good deal about the same locality. The autumn altogether has been very prolific in the finer butterflies here. Cynthia Cardui kept us company from early in August till a late period. Fine specimens of Polychloros have been about. Iö was in countless multitudes, and Rhamni, previously of rare occurrence, has been more commonly met with.—*Henry Walter Bates; Queen St., Leicester, October* 3, 1843.

Note on the occurrence of Colias Edusa in Surrey. I captured one at Fetchamdowns on the 16th of September: on the 17th Mr. E. Doubleday caught two at once with his hat, in a field in Headley lane, where we saw about a dozen more, but had no nets to take them with. Mr. B. Standish has taken two at Camberwell; and a few have been seen and taken at Riddlesdown: but I do not think it has been so common as C. Hyale was last year, at least in the neighbourhood of London.—*J. W. Douglas; 6, Grenville Terrace, Coburg Road, Kent Road; September* 28, 1843.

Note on the occurrence of Colias Hyale in Kent. Mr. B. Standish took one between Birch and Darenth woods, in August, and I saw one at Headley-lane, on the 17th of September.—*Id.*

Note on the occurrence of Colias Hyale in Kent and Sussex. I took a specimen of this butterfly in the field facing the Bull inn, a few days back, and I saw another on the 26th of last month, on the banks of the Shoreham and Brighton railway; these are the only two specimens that have come under my observation this year, and I understand very few have been taken. I could not see any in the same lucerne field that I took so many in last year at Arundel.—*Samuel Stevens;* 38, *King St., Covent Garden, September* 22, 1843.

Note on the occurrence of Sphinx Convolvuli at Lower Clapton. I captured a fine specimen of Sphinx Convolvuli in my garden, in September, 1842.—*R. Wakefield; Lower Clapton, September* 5, 1843.

Note on Anthrocera Loti. In 1841 I found the 5-spotted burnet-moth (*A. Loti*) plentifully at the beginning of June: this year they did not make their appearance till six weeks later, namely, about the middle of July. I refer to the Isle of Wight. In the former year they were hatched on the stems of the mowing grass; and had they been later in arriving at maturity, would have perished in the hay that year. In the present year I did not find them at all about the mowing grass, but on rough ground that never is mowed. Now since the season causes an undoubted variation in the time of their appearance, am I fanciful in asking,—"Did not instinct teach the larvæ in the present instance to avoid those places that would be dangerous (which in the year of the early disclosure of the moth, they frequented with impunity), and to seek a spot less hazardous, whereon to undergo their transformation, when the unfavourable character of th season would necessarily delay the appearance of the perfect

insect?" I leave the fact, and the inference I draw from it, for the consideration of your readers, if you think it worth recording.—*J. F. Dawson; Ventnor, Isle of Wight, October* 3, 1843.

Note on the Names of British Moths. During a recent visit to Paris, I took the opportunity of comparing some of our insects with the specimens in the splendid collection of M. Pierret; and having thus been enabled satisfactorily to clear up some confusion in the nomenclature, I send you a list of Bombyces and Noctuæ, and in a future number may make a few remarks on some Geometræ.

Hepialus carnus. The insect known by this name in England is a mere variety of H. velleda; the true H. carnus is very distinct, and has not been found in Britain.

Cerura bicuspis, (Stephens). This is the C. furcata of the continent; Hubner's bicuspis is very distinct.

Porthesia chrysorrhœa and *auriflua*. These names are reversed in England; chrysorrhœa of the continental authors being phæorrhœa of Curtis and Donovan, and auriflua the chrysorrhœa of English authors.

Orthosia sparsa, (Stephens &c.) The true Orthosia gracilis of continental authors.

Orthosia gracilis (Stephens). *Noctua subplumbea* (Haworth). The Orthosia populeti of Boisduval &c., and Noctua populeti of Fabricius.

Orthosia lunosa of British authors appears to be O. subjecta, but probably is not distinct from the Noctua humilis of Fabricius.

Mythimna grisea of Stephens &c. is the true Lithargyria of Hubner &c.

Agrotis pascuea of Curtis is Hadena australis of Boisduval, Aporophyla australis of Guenée.

Pyrophila Tragopoginis and *tetra*. We have only the former species in Britain; P. tetra is a totally different species, with copper-coloured wings.

Xylina semibrunnea of English authors is the true X. petrificata; and petrificata of English cabinets is the X. oculata of Germar.

Hadena ochracea (Stephens) is the Dianthesia Echii of Boisduval.

Mamestra aliena (Stephens' Cat. No. 6223) is M. infesta, *Och.* M. anceps, *Hub.*

Apamea unanimis (Och.) This is the species known in this country by the name of A. secalina, but the secalina of Hubner is a mere variety of A. didyma.

Miana Duponchelii, (Bois. &c.) This species occurs in Britain, and is probably the Noctua minima of Haworth.

Miana literosa (Stephens) is the M. suffuruncula of Ochs.

Miselia compta of British cabinets is Noctua conspersa, *W. V.* I have not seen a British specimen of compta, though it probably occurs here. The genus Dianthesia of Boisduval is a most natural one, although the British species belonging to it have been placed in three or four different genera, and associated with species to which they seem very little allied. The following are the British species: — 1. Dianthesia albimacula, *Bork.* 2. D. conspersa, *W. V.* 3. D. cæsia, *W. V.* 4. D. capsincola, *Esp.* 5. D. Cucubali, *W. V.* 6. D. Echii, *Bork.*

Cucullia Solidaginis (Stephens) appears to be C. Gnaphalii, *Hub.*

The insect taken at York by my friend Thomas H. Allis, and supposed to be Apamea unanimis, is Orthosia congener of Boisduval, of which Caradrina iners of Treitschke is a variety.—*Henry Doubleday; Epping, August* 30, 1843.

Note on Cerura Vinula. Last summer I found several caterpillars, and put them into a breeding-cage together. In due time they formed their cocoons as usual, against the side of the cage, except one, which made its covering just below the surface of the

earth at the bottom of the cage, and unattached to the cage itself. Several pieces of earth were woven into the fabric, and the whole resembled exactly the cocoon of Cucullia Verbasci. The moth appeared on the 4th of May. I do not remember hearing of a similar instance of departure from the usual habit of this genus.—*J. W. Douglas;* 6, *Grenville Terrace, Coburg Road, Kent Road, September*, 1843.

Note on Cucullia Asteris. Several larvæ of this hitherto rare species were taken last August and September, on Solidago Virgaurea, at Birch wood. They formed a tough cocoon below the surface of the ground, just like C. Verbasci, and the moths appeared from the 6th to the 24th of June.—*Id.*

Note on Acronycta Ligustri. I beat one larva from an ash tree at Birch wood, September 4, and the moth appeared June 16.—*Id.*

Note on Scoliopteryx Libatrix. One of your correspondents, (Mr. Bladon, Zool. 260) mentions Scoliopteryx Libatrix being found in a torpid state during the winter months. It may be interesting to him to know that the usual time of our capturing this insect has always been during its hybernation. It is seldom that I have taken it flying at night, and have only once reared it (from a beautifully transparent green-coloured larva feeding on willow); but in the latter part of October or early in November, being of course guided by the weather, it retires to winter quarters, and may be found in cupboards, or any other place of apparent security accessible to it, throughout the winter. I have procured six or seven specimens at a time during its torpidity, from a small cave on the banks of the Teign, where it retires with Vanessa Iö, V. Urticæ, Alucita hexadactyla, several kinds of dipterous insects, and sometimes Rhinolophus Ferrum-equinum, as companions. All the Vanessæ, I have no doubt, hybernate, as V. Polychloros and Atalanta may often be seen in the earlier months of spring. Several other Noctuæ and Geometræ, amongst which may be mentioned Xylina semibrunnea and Euthalia psitticata, are also sometimes torpid during the winter. — *Robert C. R. Jordan; Lympstone, Devon, September* 18, 1843.

Note on the capture of Moths on Sallows near Norwich. The following moths were taken on the blossoms of the sallow, near Norwich, from the 25th of March to the 10th of April, in the springs of 1841, 1842, and 1843.

Semiophora gothica	Orthosia stabilis	Xylina Lambda
Orthosia instabilis	cruda	Calocampa exoleta
gracilis	Glæa rubricosa	Hadena Lithorhiza
munda	satellitia	Hibernia capreolaria
sparsa	Vaccinii	Depressaria applana

—*Henry F. Farr; Lower Close, Norwich, August* 17, 1843.

Note on the capture of Moths on Ivy, near Norwich. The following were taken on the blossoms of the ivy, near Norwich, from the 22nd of September to the 1st of December, in the autumns of 1840, 1841 and 1842.

Triphæna orbona	Orthosia macilenta	Polia flavocincta
Agrotis æqua	Glæa satellitia	seladonia
suffusa	Vaccinii and var.	Xanthia fulvago
Graphiphora C-nigrum	spadicea	flavago
Orthosia litura	subnigra and var.	aurago
pistacina	polita	citrago
sphærulatina	Xylina Lambda	rufina
lota	Miselia Oxyacanthæ	Phlogophora meticulosa
flavilinea	Aprilina	Larentia cervinaria

Euthalia miata Thera variata Oporabia dilutata
Ctesias spartiata coniferata —*Id.*

Note on the appearance of Moths during rain. In recording the capture of Nyssia hispidaria (Zool. 176), Mr. Edleston says that he "captured forty-five males and eight females, notwithstanding it rained incessantly," thereby implying that such weather is unfavourable. Now it is well known to the old London collectors, and this may be the means of making it known to others, that a warm rain, particularly after drought, is exceedingly favourable to the development of moths from the pupa state, and they rarely omit, on such occasions, to search for them. I have seen dozens captured from palings during and after rain, where previously not one was to be seen.—*J. W. Douglas; Coburg Road, Kent Road, August*, 1843.

Note on the capture of Xanthia Xerampelina, at Crambe, near York. On Saturday, the 26th of August, as I was getting out of my gig to open a gate between Crambe and Howsham, I saw a moth lying on its back in the road; on picking it up, it proved to be a fair specimen of the centre-barred sallow (*Xanthia Xerampelina*), dead but not stiff. I know of but one other specimen captured in this neighbourhood, and that was five or six years ago, by Mr. Cook, at Langwith, near this city, who saw another the same day, but lost it. A specimen was taken about 1826 or 1827, at Bromsgrove, in Worcestershire, by the Rev. R. P. Alington.—*Beverley R. Morris, M.D.; York, September* 2, 1843.

Note on the capture of Calocampa vetusta, at Birch wood, and also at Hammersmith. I had the pleasure of taking a fine specimen of this rare moth at the sugar, at Birch wood, a few days back; and on the same evening, and at the same time (half past 8), my mother took a specimen at the same bait in our garden at Hammersmith. I little expected to meet with it in our neighbourhood. I may also mention among other things that I took at Birch wood, on the same evening, six specimens of Charæas fusca, plenty of Xanthia fulvago and flavago, and one of the variety known until recently as gilvago, as well as abundance of Ceropacha diluta: and on the week previous, I took two of Segetia neglecta. — *Samuel Stevens;* 38, *King St., Covent Garden, September* 19, 1843.

Note on the Dates of Appearance of some Lepidopterous Insects at Teignmouth. Owing to the mild spring, insects appeared this year much earlier than they usually do; for instance, I took the female of Pontia Cardamines on the 8th of April; on the 9th, Polyommatus Argiolus, male; 10th, the last day of the continuance of warm weather, Hipparchia Ægeria, Pontia Rapæ, P. Cardamines, Vanessa Iö and V. Urticæ were plentiful during the morning and warmer parts of the day, but in the evening there was a fall of snow, which lasted with intermissions for about a week, of course, interrupting their appearance for a time. May 4th, Lozotænia trifasciana. June 1st, Spilonota rusticana; this insect may always be found where there is plenty of Tussilago Farfara, which I suppose the larva feeds on; 10th, Pterophorus trigonodactylus, Pt. carphodactylus, Botys borealis, on the cliffs at Teignmouth; 20th, Eudorea angustea, this insect is double-brooded, appearing again in September and October; 28th, Pterophorus lunadactylus, the larva of this insect feeds on Ononis arvensis, on the heads of which plant it may generally be found, it is green and slightly hairy; Eudorea pallida, a double-brooded insect, appearing at the same time as E. angustea. July 14th, Augerona prunaria, the male of this insect often puts on the garb of the female, and *vice versâ;* the female is often of a light yellow-ochre colour, instead of orange, and much larger than the male, which may always be known by its pectinate antennæ; a

similar light variation often takes place in the female of Hipparchia Galatea, which, instead of being marbled with black, has the markings of a light brown; Cledeobia albistrigalis.—*Robert C. R. Jordan; Teignmouth, September*, 1843.

Note on the Walking Branch Caterpillar. There occurs occasionally a caterpillar, so exceedingly like a small dead twig or branch of a tree, that it is almost impossible to distinguish it, unless you happen to see it move: it is also remarkable that the caterpillar bears the strongest resemblance to the branches or twigs of the particular tree on the leaves of which it is feeding: doubtless this similarity is a wonderful provision of Providence to deceive the birds, to which, from their exposed situation, they must otherwise instantly become a prey. — *M. Saul; Fort Green Cottage, Garstang, October*, 1843.

Note on the Economy of Ants. The observations on ants by Mr. Frederick Smith (Zool. 262) brought to my recollection a circumstance which I observed last month in a colony of ants in my garden. They had collected round the entrances of their galleries a number (probably fifty) of the seeds of the common violet (*Viola odorata*) which they were carefully carrying into their retreats. Modern writers on ants repudiate the early statements of their laying up corn for their winter store, and destroying the germinating principle; and therefore I was not a little surprised to witness this apparent confirmation of these early statements: for it is difficult to conceive for what purpose they could be storing up these seeds, unless for a future supply of food. I very carefully compared the seeds which I took from the ants with others taken from a violet growing in the immediate neighbourhood of the ants' nest; therefore I am sure that the seeds the ants were carrying into their holes were veritable violet-seeds. Probably some of your correspondents would be kind enough, through your Magazine, to give an opinion on the object the ants had in view in collecting and storing up these seeds. Mr. Smith says he never witnessed a battle of ants; I once had the good fortune to see one, and recorded it in Loudon's 'Magazine of Natural History,' iv. 149. — *R. Wakefield; Lower Clapton, September* 5, 1843.

"*A Battle of Ants.*—On the 16th of last May, I was walking in my garden before breakfast, when my attention was attracted by an unusual assemblage of ants in the gravel-walk; the species, I believe, was that of which Huber, in his 'History of Ants,' has given a representation, and is called by him Formica fusca. On a closer examination I found they were fighting; they were collected in groups of forty or fifty, running rapidly about, and then stopping and pulling each other with their mandibles. The field of battle did not extend over a surface of more than 3 ft. square, and there were probably five or six groups all eagerly contending with each other. After watching them with much attention for about half an hour, I was called in to breakfast; and on returning, after a lapse of twenty minutes, the battle was still raging. How long the conflict lasted I am unable to say; for when I first saw them they evidently had been some time engaged in their deadly game, and I was compelled to leave them before the battle was over. I however visited the spot again, about one o'clock, and they were then busily employed in removing their slain comrades. I counted about thirty dead ants on the field; more, probably, had fallen, as doubtless many had been removed before my return. In one small spot, of not more than an inch square, seven dead ants were extended. Their courage is very extraordinary; for in several instances, with such fury and obstinacy had these little warriors contended, that two might be perceived locked in each other's embraces, having died in this their last mortal struggle. We have all read of battles of ants, but as far as my enquiries have extend-

ed, I believe but few have witnessed their combats. I have observed ants for many years, but, with this exception, never saw anything like hostility among them. Some of your readers may be pleased with this account from an eye-witness. — *O. July* 10. 1830." — '*Magazine of Natural History*,' iv. 149.

Note on the singular situation of a Bee's Nest. Whilst entomologizing on the cliffs at Teignmouth in the month of June, I was rather struck by seeing a bee fly out of a snail-shell. First capturing the bee, as the most likely of the two to escape, I proceeded to examine the shell which he had chosen for his residence. A little below the mouth there was a thin partition made of the leaves of plants, very finely masticated and fastened together by some glutinous substance, leaving however a round hole in the middle large enough to allow the occupier ingress and egress. The interior of the nest was not examined, thinking it a pity to destroy the specimen. The predominating colour of the bee is brownish orange, barred with black or deep brown, the wings dark and small. I have however enclosed a sketch of the bee and nest, which will give a better idea of both than any description.—*Robert C. R. Jordan ; Teignmouth, September*, 1843.

Bee and its Nest in a Snail-shell.

Notes on Bees' Nests in Snail-shells. " Their nests are hidden in the ground, crevices of old walls, old wood, and even occasionally in the deserted shells of garden snails. Of the latter some particulars are given by M. Robineau Desvoidy, who has obtained two species—Osmia bicolor, and a new species which he names O. helicicola, —from nests respectively formed in the deserted shells of Helix nemoralis and H. pomatia. O. bicolor lays two eggs in each shell, the female egg being always uppermost: above these are constructed three or four cells of sand, separated from each other by a membranous partition. O. helicicola deposits ten or twelve eggs, separated from each other by distinct partitions, each being provided with a magazine of honey ; but they do not wall in the different strata with sand, or any earthy matter placed above the domicile of their progeny."—*British Cyclopædia : Nat. Hist.* iii. 360. The drawing sent by our correspondent does not represent Osmia bicolor, and may therefore prove to be O. helicicola, a new and most interesting addition to our British Fauna ; it is also probably identical with Huber's Trachusa aurulenta, the habits of which are detailed by that author in the second volume of the ' Memoires de la Physique et d' Histoire Naturelle de Genéve.' We should feel much obliged by a sight of the specimen.—*Ed.*

Enquiries respecting the Humble Bee. I have several times within the last few days found large humble bees crawling on the foot-paths, with their wings withered up, or apparently gnawed close off, so that nothing but a stump was left. How is this to be explained ?—*F. Holme ; C. C. C. Oxford.*

Note on the sudden appearance and disappearance of Insects. In the summer of 1836 great ravages were committed among the field turnips in several districts, by a black

caterpillar, which had been unknown to the present generation, until two or three years before. In one instance which I particularly noticed, the insects apparently commenced operations from near the hedge, and marched regularly across the field, not leaving *the smallest particle of green* upon the turnips behind them, and eating entirely even into the crown of the root, which consequently did not shoot again. After thus destroying a certain portion of the crop, they suddenly stopped, and the remainder of the crop was uninjured. The annoyance from these insects lasted, it may be remembered, a very few years, and then ceased, as it had begun, all at once. I can recollect other instances of the kind. Several years before, the whitethorn hedges of a particular district (many miles in extent), which are there very numerous, and very neatly maintained, were infested by a peculiar species of caterpillar to such a degree, that by the time the vermin were ready to change, not a single green leaf remained, unless a bramble or other plant protruded through the hedge, since they would touch nothing but whitethorn. Numerous remedies were tried, but produced no perceptible diminution of the insects, until, after thus prevailing three or four years, they suddenly vanished, and where myriads formerly existed, hardly one could be found. The caterpillars, when changing, suspended themselves in clusters within a web, and, previously to their disappearance, I discovered that these clusters were almost invariably filled with maggots, which had penetrated the cases of the aurelia and devoured them. The maggots greatly resembled those found in flesh, only being smaller. About the same period the oaks in the district suffered a similar visitation, though not for so many years; the tender leaves being so completely destroyed, that the trees resumed their wintry aspect. I think this moth, when it ceased to be very abundant, did not disappear so completely as the preceding. Also in the year 1840, if I recollect rightly, the farmers in some parts of Oxfordshire and Berkshire, received great injury from the immense multitudes of cockchafer grubs, which attacked their turnips, completely devouring the roots, and gradually extending over the fields, to the *total* destruction of the crops. A farmer, one of the sufferers, told me, that he had found as many as (I think) seventeen or eighteen grubs under a single turnip; and I witnessed that it was impossible to pull up one, without discovering a large number of the vermin in and beneath it. How abundant the mature cockchafers had been previously, and were afterwards, I am not aware; but the ravages of the larvæ to such a serious amount were confined, I believe, to the season I have alluded to. — *Arthur Hussey; Rottingdeane, Sussex, July* 22, 1843.

Note on the blighted appearance of the Oaks, &c. I would refer your correspondent the Rev. F. O. Morris (Zool. 272), to a note of mine in 'The Entomologist' (Entom. 157), where I have stated what I saw had been done to the oaks and beeches in the New Forest; and I have no doubt that the blighted appearance of the oak and ash trees in Yorkshire proceeded from a similar cause.—*J. W. Douglas;* 6, *Grenville Terrace, Coburg Road, Kent Road, September*, 1843.

" *Orchestes Quercûs.* During a visit to the New Forest from the 8th to the 13th of June, I was struck with the brown appearance of the oaks; and on examination I found that nearly every leaf contained between its cuticles a larva of an elongate, flattened form, which had eaten the parenchyma of half the leaf, and by destroying its vitality made it seem as if it had been scorched. About the concavity formed by the separation of the upper and under skins of the leaf, the larvæ wriggled with much activity when shaken or disturbed. In the majority of the leaves which I examined, the larvæ had become pupæ, and in a few days pupæ only were to be found. These re-

tained all the activity of the larvæ when touched, but otherwise they remained at rest in one part of the leaf, which just there had an inflated appearance. I brought home with me several of the leaves, and on the 26th of June the perfect insect emerged by making an aperture in the leaf. The leaves of the beech, I observed, had been attacked in a similar way, and to as great an extent, but the depredator had escaped from his cover. I beat a great number of Orchestes Fagi from the trees, and have no doubt they had done the deed."—'*The Entomologist*,' *p.* 157.

Note on the blighted appearance of the Oak Trees.—

"Nudaque ramosæ tendebant brachia quercus."

A brief postscript to my last communication respecting the withered appearance of the oak and ash trees in Yorkshire this summer. I was in the neighbourhood of Thirsk a short time since, when the same fact was pointed out to me by a lady, as having been observed by her, and it was indeed as apparent there as here. The oak trees now, however, have assumed a new foliage in repair of their previous deficiency; and the light yellow and dark green leaves present a singular and striking contrast. Until lately it would have been hard to meet with a tree offering anything like a hiding-place for King Charles, had he had the fortune to have lived a couple of hundred years later than he did, though in that case I hope he would not have needed one for that purpose.

"A song for the oak, the brave old oak
That stands in his pride alone;
And still flourish he, a hale green tree,
When a hundred years are gone."

—*Francis Orpen Morris; Crambe Vicarage, September*, 1843.

Notes on the British species of Carabus. Though several of the species of Carabus are so generally distributed through England, as to be reckoned among our commoner Geodephagous insects, I think it will be found on investigation that even these are in some measure local, or occur in far greater numbers in some districts than in others. Thus, Carabus violaceus, which is by far the most numerous in South Gloucestershire, is much less frequent near Oxford than C. nemoralis and C. cancellatus, the latter of which is of rather rare occurrence in the former locality: while C. catenulatus, which Stephens and other writers describe as abundant, is (as far as my experience goes) very sparingly distributed in the midland counties, where I do not think I have taken a dozen specimens in all. C. monilis, though not plentiful anywhere, seems to be very generally distributed throughout England and Ireland: I think it is in some measure a southern species, as I have found the specimens from the southern coasts, particularly from Cornwall, larger and more brilliant in colour, as well as more numerous, than in the more northern and inland districts. About Oxford, C. nemoralis is decidedly a vernal species, and crushed specimens are found, literally in hundreds, about the paths, in April and May. C. cancellatus is later in its appearance, and more nocturnal in its habits, and hybernates in considerable numbers under the bark and at the foot of the trees in Christchurch meadow—a tract which, being surrounded by water on three sides, and by buildings on the other, is almost a *preserve* for Coleoptera, and affords many species not elsewhere common in the district. In the August evenings I have found numbers of this species on a particular part of the foot-path between Oxford and Iffley, which then swarms with young toads just emerging from the tadpole state, on which the Carabi were busily preying. Several specimens of Goërius olens

were aiding in the slaughter of the unfortunate little reptiles, but none, as far as I could detect, of the other Carabi or larger Harpalidæ. C. cancellatus differs considerably from its congeners in its general habits, separated elytra, and rudimentary wings, which I think it possible may be used for flight; since however inadequate they may appear for such a purpose, they are at least as well adapted for it as those of Phosphuga atrata, which I have several times taken on the wing. I never saw, in any English work on Natural History, any notice of the power possessed by the Carabi (I can personally answer for C. cancellatus, nemoralis and violaceus) of ejecting an acrid fluid *à posteriori* with considerable force to a distance of six or eight inches, and generally so well directed as to strike their captor in the eye. This has not escaped the notice of the continental entomologists, and the incident quoted by Kirby and Spence (Introduction, ii. 244, 5th edition) is probably referable to it. The Carabi do not appear to be often infested with mites, at least to any extent; but in May, this year, a specimen of C. monilis was brought to me, so completely and thickly encrusted with closely-adhering parasites (I believe Uropoda) that I was not able to determine the species until I had partially removed them, which I did not effect without some difficulty. It was found under a garden pot, where it had probably been imprisoned, and then attacked, or rather overwhelmed, by this swarm of enemies. I am not aware that any of the Carabi, or indeed any of the Geodephaga except Broscus cephalotes (Zool. 271), prey on their own species when other food is to be had, but to the smaller Harpalidæ they show no mercy: and I once found C. cancellatus making a meal on Abax striola, which I should have imagined almost a match for its assailant. C. violaceus I have very frequently found in houses infested by cockroaches and crickets, preying on these insects—and it seems to be the only species with these domestic habits, as I do not remember finding any of the other common species in such situations, except stray individuals, in localities where they were more numerous than C. violaceus. As I have been remarkably fortunate in the acquisition of the rarer British species, I subjoin a few localities. C. intricatus I took in August, 1836, near Holdsworthy in Devonshire, a remarkably fine female specimen, fully 15 lines long: and in September of the same year, I took a specimen of C. convexus at Winstanley hall in Lancashire. Of C. granulatus I have a specimen that was taken by a friend, near Doncaster. And of C. purpurascens, which Stephens in his 'Manual' has admitted as British, I at one time thought myself the possessor of the only authentic British specimen, which fell into my hands as follows. I was in the shop of a Natural-History dealer in London, when two ragged *Spanish legionaries* came in, whom he had employed to collect insects on the Surrey hills; and out of a vast number of specimens of all sorts thus obtained, he allowed me, for half-a-crown, to pick out what I wanted before he dried and set them, stipulating, with laudable caution, that I should take none of the Lucani, Cerambyces, and other showy species. I had certainly no reason to complain of the bargain thus made, as besides C. purpurascens, I acquired, I think, fifteen other species which were deficient in my cabinet. The names above given are those of the 2nd edition of Stephens's 'Nomenclature,' some of them, as cancellatus and granulatus, having been transposed in the 'Manual.'—*Fredk. Holme; C. C. C. Oxford.*

Note on Agonum affine. Of this insect, said by Stephens to be rare, I took twenty-eight specimens at the foot of a tree in Christchurch meadow, in January, 1836, but have not found it there since. Mr. Matthews has taken it at Weston-on-the-Green. *Id.*

Note on the Habits of some Species of Amara. Some species of this genus, contrary to the usual habits of the Harpalidæ, counterfeit death when taken, folding back the antennæ and limbs, and remaining motionless when taken into the hand; when

thrown on the ground they run off, but resume the death-like appearance if a second attempt be made to seize them.—*Id.*

Note on Badister bipustulatus. I have seen this insect, when pursued, dash into a puddle of water, and run through on the bottom completely immersed.—*Id.*

Note on Haltica Brassicæ. Haltica Brassicæ, said to be a local species, is very common near Oxford, and particularly under bark in Christchurch meadow in winter; and I have taken H. ochripes of Curtis in the same localities.—*Id.*

Note on Velleius dilatatus. A remarkably fine specimen of this insect, one of the rarest of the British Coleoptera, was taken by F. Sidney Parry, Esq., July 22, 1843, in his own grounds at Sunninghill, under a piece of bark which lay upon some sap exuding from the foot of a tree.—*Id.*

Note on the capture of Coleopterous Insects near Edinburgh. I send you a list of a few species of Coleoptera which I have taken in the Edinburgh district in the last two or three seasons. Although the frequent rains and cold easterly winds during the past summer have had a very adverse effect on the appearance of insects generally, I have taken some valuable species. Sweeping the grass in woods, under fir-trees, seems to be an excellent plan; by this means I have taken several rare insects, which I never met with in other situations. I have omitted many species which are taken almost everywhere, and would therefore unnecessarily swell the list. Phalacrus æneus and geminus; a single specimen of the latter. Leiodes dentipes, Gyllenhallii, multistriata, punctatissima (rare), castanea (rare), thoracica, polita, brunnea, ferruginea, rufipennis, suturalis, humeralis. The neighbourhood of Edinburgh seems to be rather rich in this genus; I meet with specimens of various species occasionally throughout the summer months, by sweeping, but they occur much more frequently on wall-tops in autumn. Agathidium atrum, nigrinum and orbiculare; these were also taken on wall-tops in the autumn. Atomaria atra, Dalmeny park. Latridius testaceus, ditto. Tetratoma ancora; this rare and pretty insect I have taken very sparingly by sweeping under fir trees, in Dalmeny park. It was confined to one small wood in the grounds. Ips ferruginea, much rarer this year than formerly. Ragionycha pilosa, Roslin, June, Hylastes ater and obscurus, under felled firs; the former species very abuudant. Cœliodes Geranii, Arthur's seat. Otiorhynchus atro-apterus, sand-banks by the shore, on thistles, abundant. Otiorhynchus tessellatus, a new species; a single specimen in Dalmeny park. Omias sulcirostris, Dalmeny park, August. Rhynchites cyaneopennis, ditto. Crioceris obscura, a single specimen. Haltica flexuosa, atro-cærulea and Modeeri. Macrocnema Spergulæ and picina. Chrysomela pallida, Roslin, on the hazel, in June. Ripiphorus paradoxus, a specimen was taken by a friend of mine in the vicinity of Roslin.— *R. Northmore Greville;* 31, *George's Square, Edinburgh, September* 6, 1843.

Note on the capture of Trichius variabilis in Surrey. I had the good fortune to take a specimen of this rare beetle flying, near Riddlesdown, on the 13th instant. It has not, I believe, before this, been taken elsewhere than in Windsor park.—*J. W. Douglas;* 6, *Grenville Terrace, Coburg Road, Kent Road, August* 19, 1843.

Note on Crickets. Crickets not only come out of their holes after persons have quitted the room, but even whilst they are moving about by candlelight. They used to come out in my kitchen when the servants were at supper, as regularly as possible, every evening.—*Wm. Hewett; East Ilsley.**

* This, with other notes bearing the same signature, form portions of a work about to be published by Mr. Hewett, on the Zoology, Botany &c. of East Ilsley.—*Ed.*

Note on the Sudbury Mechanics' Museum. By T. B. Hall, Esq.

The foundation of Museums of Natural History in provincial towns cannot fail of being a source of interest to all lovers of science; and I have great pleasure in being able to record the formation of two very creditable museums in the counties of Suffolk and Essex. They each occupy very handsome buildings, erected expressly for the purpose. The one of which I intend to give a short account in the present article, is the Sudbury Mechanics' Museum; the other is situated at Chelmsford, a notice of which I shall reserve for a future number of 'The Zoologist.'

Having been applied to on behalf of the Chelmsford Museum, to present a series of land and fresh-water shells, and feeling a strong desire to assist the Sudbury Museum, on account of the hospitality and kindness which I have experienced from the members on various occasions; I made a point of visiting the museums for the purpose of seeing whether donations would be duly appreciated, and proper care taken of them; and I have much pleasure in being able to state, that from the zeal with which they are carried on, I am confident that any donations would be gratefully received and acknowledged, and cases would be provided for them, so that they might be suitably exhibited.*

I cannot here help giving an extract from a letter which I have received from Mr. W. D. King, the President of the Sudbury Mechanics' Museum, as it fully explains the motives that prompted those who were most active in the formation of it. This gentleman, in a letter to me dated the 20th of September, states that "its founders were actuated by a wish to excite amongst all classes (and the working classes in particular) habits of attention to the works of Nature, which might afford them rational and instructive amusement. They considered that whilst in the present day a strong and just feeling of regret prevails, that the working man's leisure hours should be spent in the depraved but exciting pleasures of the ale-house, too little attention is given to the very important object of providing for those leisure hours employment at once instructive to the man, and in which his wife and his family may participate. Nor were they without a hope that the collections might gradually acquire a local interest and value, which would render them additionally attractive. Encouraged

* Subscriptions and donations will be thankfully received by the Treasurer, W. Warner, Friars' Street, or by W. D. King, at the Bank of Alexander and Co.

by liberal offers of specimens from a few individuals, the Committee persevered, and after some opposition and many discouragements, the little Museum was opened with the commencement of the year 1842. Its progress has quite equalled our humble expectations. The working classes are much pleased with it, and on the evenings when it is opened to members generally, it is gratifying to see the pleasant little family groups who attend, evidently interested by what they see, and grateful for the privilege thus afforded."

In one of the Reports now before me, the Committee of the Sudbury Mechanics' Institute and Public Library, state that their object is the instruction of the members in the various branches of science and useful knowledge, to the exclusion of party politics and subjects of local controversy: and in conducting the Institution, their primary aim is general usefulness, and their design is to provide information in a pleasing and attractive form, — to interest while they instruct. With the view of providing for the use of the members more suitable apartments than they already possessed, they purchased premises in Friars' Street, near the Market hill, and erected a building which they believe will afford the required accommodation at a very reasonable cost. With some important additions recently made, the Museum now contains about 310 specimens of British birds (comprising nearly 170 different species), with the eggs of 160 species ;—upwards of 350 foreign birds, including a pair of the rhinoceros hornbill and Argus pheasant, some beautiful plantain-eaters, two or three species of the jungle-fowl from India, scarlet ibis, Indian herons, bustards, cuckoos, rollers and kingfishers, Virginian eagle owls, Europæan vulture, the wandering albatross, pelican, crane, toucans, and a variety of parrots, orioles, tanagers and humming birds. A few British quadrupeds, amongst which are an otter, a polecat, two marten cats or pine martens (from Ireland), and a young seal. An insect-cabinet, containing twelve drawers of British and foreign butterflies, moths, &c. An extensive series of British land, freshwater and marine shells, and some foreign shells, besides minerals, fossils, reptiles and other curiosities. Amongst various objects which possess additional interest from having occurred in the neighbourhood, may be mentioned a fine otter, killed near Sudbury, a black hare, killed at Glemsford, a white stoat (better known as the ermine) killed at Henny, a pair of curlews killed in the neighbourhood, a pair of the Arctic tern, killed on Friars' meadow, and a spotted woodpecker.

The following are the terms of admission. The payment of four shillings per annum confers upon a subscriber (if of the working

classes) the use of the library and reading-room and a right to attend lectures. A subscription of eight shillings per annum constitutes a member, who is also entitled to vote at the annual election of Committee, and is himself eligible to be nominated to that office. And a subscription of twenty-one shillings per annum constitutes an honorary member, who has the further privilege of attending and voting at the Committee.

T. B. Hall.

Coggeshall, September, 1843.

Note on Bats by Daylight. The circumstance of the bat's being seen on the wing in the middle of the day, is of no uncommon occurrence, and has been noted in the pages of 'The Zoologist;' but in these instances no other than the common little pipistrelle is referred to, with the simple circumstance that the animal was busily employed in hawking for flies. I have repeatedly witnessed the same thing, and even in weather sufficiently cold to warrant the belief that the hunger of the bat must have been severe, to have caused it to take flight. But in the course of the past summer, two instances have come under my notice, which were attended with sufficient novelty to deserve a separate record. May 24, at half-past 3 o'clock in the afternoon, whilst walking in a little plantation of trees, the sky somewhat cloudy, a bat approached and hovered so near to me, as to show that it was much at its ease, and intent on the pursuit of prey. I observed it take a fly from off a leaf without alighting, and it flew so gently and repeatedly near me as to afford me an opportunity of easily discerning that it was the long-eared species. So little of timidity did it display, that I made two or three attempts to strike it down with a branch of a tree covered with leaves, before it took the alarm and changed its situation. Its flight was visibly different from that of the pipistrelle, being more heavy, less agile, and with more of the owl-like flap of the wings. The other instance occurred on the 30th of August, at half-past 5 o'clock, with the sky clear, and the sun shining bright. It was the pipistrelle, and presently after its appearance it mounted high in the air—judging from the neighbouring hills, probably not less than 250 feet; and while making busy circles in pursuit of food, it had the ill luck to be perceived by a swallow, which immediately began a pursuit. It persecuted the poor animal by repeatedly striking at it, and following it closely in all its rapid turns, until at last it compelled the bat to descend to the shelter of the houses. But when the persecutor had withdrawn, the bat boldly mounted again to the region that seemed to teem with its favourite food. It was, however, again beset, and two or three swallows joined in the persecution, which, after no small time, and various attempts to keep aloft, at last compelled the bat to seek security by descending to shelter. Satisfied with their success, the swallows speedily rejoined their companions in the higher regions, where was a multitude of them engaged in their ordinary avocations; upon which they seemed to have regarded the bat as an unauthorized intruder. But a few minutes only had elapsed, when I was surprized to see the persevering little animal again mount aloft, and engage with much activity in the pursuit of what he seems to have thought he had as good a right to as his more powerful tyrants. But the last attempt was more unfortunate than the former; for incited perhaps by what they probably would have denominated the *impudence* of the proceeding, a host of

swallows, too numerous for me to count, commenced an attack. Many were the turns and returns; many, but unsuccessful, the attempts to inflict a blow; the bat was evidently undaunted, though outnumbered and overpowered; and it was a considerable time before it was compelled to resign the elevated region to which it had so perseveringly aspired.—*Jonathan Couch; Polperro, September* 27, 1843.

Note on the Badger. That singular animal, the badger, is not uncommon with us, breeding in some of our coverts every season. About the month of March these animals begin to prepare the earths for the reception of their young, by collecting a great quantity of coarse moss, which they heap up in regular rows throughout the wood, and when thoroughly dried, carry it to their burrows. This singular practice, which, to my knowledge, has never been noticed by any author, is called by the country people the "badgers' hay-making." They breed twice in the year, bringing forth five or six young ones in each litter.—*Wm. Hewett; East Ilsley; October*, 1843.

Note on the Otter. Otters, being much persecuted, are become scarce animals in these parts. Some years ago, one of these curious creatures laid up her young in an old pollard tree, situated close to the Thames, near Goring. This was a very secure place, for the tree was hollow throughout, so that the young were laid upon the bare ground, the old one approaching through one of the principal roots, which was completely hollow from extreme age. Secure however as was this retreat, the female otter and her young ones were captured and taken about as a show.—*Id.*

Note on the keen scent of the Stoat. I observe in your No. for July (Zool. 213), a notice of the keen scent of the stoat (*Mustela Erminea*) in pursuit of a hare. A few weeks ago, as I was walking along by the side of a large wood, I saw a rabbit come out of the wood, evidently in much trepidation, yet not making any great effort to escape. Upon seeing me, however, it darted across the road, and went under a gate in the opposite side. Suspecting from its manner the cause of its alarm, I stood still, and very soon saw a stoat following exactly upon the track of the rabbit. When it came to the spot where the rabbit had started forward upon seeing me, it lost the scent, and immediately tried up the side of the road, then in the opposite direction, and at last it crossed the road, very soon hit the scent, and went away at full speed, with its tail rather elevated, and I have no doubt very soon captured its prey, although the standing corn prevented my witnessing it. It is now some years since I was present at a scene that amused me very much. I was passing one end of a large barn, which was nearly full of corn, when my attention was drawn to a noise, as of some animal working its way up the boards in the inside of the barn. Very soon I saw a stoat appear at the loop (a name given to a space left in the boarding at the end of a barn, for the purpose of unloading the corn into it, and shutting when not in use, with a door, and generally placed at a considerable height, in this instance more than sixteen feet). The stoat descended without hesitation, falling upon the ground with some force, and escaped into a hedge close by. Almost immediately, another stoat appeared at the loop, and finding that its opponent had made its exit, likewise came down in a similar manner, and taking the scent of its predecessor, followed it and very soon overtook it, when a desperate battle took place, in which the first was overpowered, and with some difficulty got away. While this was going forward, a third stoat appeared at the loop, and after looking about for some time, retired into the barn. As it was early in the spring, I concluded that the two combatants were males, contending for the possession of the third, probably a female. — *J. Atkinson; Layer Marney Rectory, near Kelvedon, Essex, August* 18, 1843.

Note on the capture of the Pine Marten, in Lincolnshire. In March, 1843, I received a fine specimen of the pine marten (*Mustela abietum*), which was caught in a common vermin-trap by one of the gamekeepers in the employ of W. Cooke, Esq., Burgh House. This specimen, which proved to be a female, was in very fine condition, and was quite free from the nauseous smell so conspicuous in most individuals belonging to the genus. Although it was the second specimen that has come under my notice during the last three years, it may be considered a great rarity in this part of our island.—*S. Willoughby; Bratoft, near Spilsby, Lincolnshire, August* 17, 1843.

Pleadings for the Dumb. By the Rev. Francis Orpen Morris, B.A. Chaplain to His Grace the Duke of Cleveland.

No. 1.—*An Apology for the Hedgehog.*

Clergyman.—What is that your man is bringing here?

Farmer Goodman.—Oh! it is only a hedgehog, Sir, which the boys caught this forenoon.

C.—And what are you going to do with it, may I ask?

G.—They are taking it home, Sir, for the dogs to kill: they are fond of a little sport, as they call it. They will kill it at dinner-time.

C.—I hope not. I never like to see or hear of anything cruel.

G.—No Sir, nor I; but then, you know, vermin must be killed, and the dogs soon make an end of it.

C.—I know that destructive animals must be kept within proper limits, and not be allowed to increase upon us, so as to become extensively injurious; but even *they* do some good in return for their mischief: and at all events the hedgehog is not one of that sort.

G.—Not a varmint, Sir? O, you don't know half the mischief it does! Why my wife could tell you how they milk the cows.

C.—Well Mr. Goodman, as your good wife will not, for a great many years, be an old woman, I shall not run any risk of offending either her or you by telling you that that is neither more nor less than an old wives' fable.

G.—Ha, ha, ha! Well, I shall tell her of that compliment you have paid her. Ha, ha, ha! But still, Sir, I really think the charge is true.

C.—You know, Mr. Goodman, that I never think half an hour ill spent in talking with any of my parishioners, and least of all with you, (another compliment, you will say, but it really is not so); and on the present occasion particularly I shall be very glad if you can give me your attention while I endeavour to convince you that the hedgehog does good instead of harm, and I am sure you will hear

reason, and so will, I trust, become a protector of this poor little animal, as well as of all others of his kind instead of destroying them. Let your man stay and hear what I have to say.

G. — Stop here, John, while you hear what Mr. —— is going to tell us. If you convince me, Sir, I am sure I will always follow your advice.

C. — I am glad to know that you are disposed to do so in still more important matters; not that even such a thing as this is to be considered as unimportant; for wanton cruelty, or the wanton and needless destruction of any of His creatures cannot but be displeasing to Him that made them; and, on the other hand, the exercise of the gentle "quality of mercy," as Shakspeare, our great poet, calls it, must be correspondingly pleasing to Him, "because He delighteth in mercy." But to return to this poor little animal. What do you mean to do with it? I mean, what use do you intend to make of it after it is killed?

G. — None at all, Sir; it is good for nothing.

C. — I do not believe that it is, when dead, though I will presently tell you what good it may do you if you spare its life, whereas if you kill it, neither its skin, flesh, spines, nor any other part of it will be of the least use to any one.

G. — No, Sir. The farming lads would throw it into the road, and the carts and waggons would soon make an end of it.

C. — Exactly so. I have often seen them lying there, and never, I am happy to say, without a feeling of pity. But, as you allow that the hedgehog is of no use after it is killed, what harm do you suppose it does when alive, besides milking the cows, which you mentioned before.

G. (hesitating). — Why, Sir, I—I—I don't recollect anything else just at present.

C. — Then, if I convince you, not only that it does not, but that it cannot be guilty of this practice, will you—indeed I am sure that you will — let this one escape back to its nest, and prevent any others in future from being killed on your land by the ignorant or unthinking?

G. — Certainly Sir.

C. — Very well — let your man bring it here. The only difficulty with me is to think how so very mistaken and absurd an idea could ever have first originated, for it carries its own confutation. Now, John, try and undouble this poor animal. You see how it is rolled up like a ball, presenting its spines in every direction as a sort of defence. Poor little thing! I dare say you feel its heart beat. There,

now you have its head out, try and open its mouth, and just consider for one moment, *is it possible* for that little mouth to suck the udder of a cow, either having crawled up its legs, or having gone to it when it was lying down?

G. — Indeed, Sir, it is not! I am sorry I have allowed a vulgar prejudice to satisfy me, without examining or thinking for myself. I wish I had never killed one, or had one killed.

C. — You are quite right. The food of the hedgehog in the summer consists of worms, snails, slugs, beetles and other insects. In the autumn, when insects have become scarce, it is glad to pick up hips and haws, crab-apples, and other wild fruits; and in the winter it goes into a torpid state, coiled up in its hole or nest, having first (as is said) rolled itself on the dry leaves, which stick to its spines, and make it a sort of outer covering. In the spring the warm weather again sets its blood into circulation, and it comes out from its winter retreat, to renew its good offices to you by destroying many insects, which if not prevented by such means as this from becoming too numerous, would do the farmers more injury than they do at present. In the mild summer evenings it is a very pretty sight to see it, as I often have, stealing up the hedge-row sides in search of its food, but the least noise scares it away, and it runs off to its lair, or if you come very suddenly close upon it, it crouches down, in hope of escaping observation.

G. — John, bring the hedgehog here: — take the string off its leg: now put it down, and let it run away; and when you go home, mind you tell your children what the priest has said. Be sure you never worry another.

John. — I'll never molest another, Master, as long as I live; and I'll be certain to tell my bairns the same.

(*The hedgehog runs off, limping a little, but evidently most happy to escape, and is soon lost sight of in some long grass*).

F. O. Morris.

Crambe Vicarage, August 1, 1843.

Notes on the Squirrel. The squirrel, that lively little denizen of the woods, was not at all common in Roxburghshire until lately. Within the last ten years or so its numbers have much increased, and it has now spread over nearly the whole county. Squirrels are most frequently seen during the spring and winter months. The thick foliage of the trees in summer hides them from our view, and, as they are by no means familiar animals, they often lurk unsuspected among the shady boughs in our immediate vicinity. But when autumnal blasts have shorn the woods of their leafy honours,

the little squirrel forces itself on our observation, as it bounds from branch to branch, or is seen quietly sitting on the top of a larch tree, diligently extracting the seeds from a cone. Should you surprise a squirrel on the lower branches of a tree, or upon the ground, to which it sometimes makes an excursion, it is astonishing to see the agility with which it escapes out of our immediate reach, and the celerity of its ascent till it considers itself safe. When come upon suddenly, I have sometimes heard one utter a sort of chatter in making its precipitate retreat. In climbing a tree when thus surprized, it exhibits a good deal of cunning, and generally contrives to keep on the opposite side of the trunk from its suspected enemy, sometimes however peering round the side to examine the cause of its alarm. I have also at times seen a squirrel ascend a little way, and then remain perfectly motionless, as if by this manœuvre to escape observation. I once caught a squirrel which I surprized on the ground, and which had not time to reach a tree, but was obliged to hide itself among a heap of stones, where I secured it. The food of the squirrel, as far as I have observed, seems to consist principally of the seeds of the larch and spruce fir, beech-mast, and the kernels of haws, which it obtains by cracking the exceedingly hard stone in which they are enclosed, rejecting the fleshy part of the fruit altogether. I have no doubt that nuts and acorns, when they can be procured, form part of its diet also. In walking through the woods, one can easily tell where the squirrel has been at work, the scales of the larch or fir cones strewing the ground under the tree which has been the object of its choice. The squirrel is sometimes guilty, especially in severe weather, of barking trees and of devouring the young shoots; and thus at times does much mischief, particularly in young plantations of pines and larches, as if the leading shoot of these trees is destroyed, they almost invariably become stunted and good for nothing. The squirrel builds a large bushy nest, near the top of a larch or spruce, but I have occasionally seen one in a hard-wood tree. The nest resembles that of the wren, having a hole in the side. The young ones do not acquire the bushy tail for a considerable time after birth.—*Archibald Jerdon; Bonjedward, September* 13, 1843.

Note on the occurrence of the Bones of a Beaver &c. near Ely. A few weeks since the skull of a beaver (*Castor fiber*) was found by some labourers, who were claying in a fen, about seven miles north-east of Ely, called Whelpmoor, in the parish of Littleport, in the isle of Ely; and about two miles south of the confluence of the Brandon river and the Ouse. The skull is in a most beautiful state of preservation, the $\frac{2}{2}$ incisors and the $\frac{4}{4}$ molar teeth being all in their places, and the bones quite perfect. It was found on the clay, beneath about six feet of moor; and on a further search, the greater part of the bones of this animal were obtained from the same spot, and are now in the possession of a gentleman at Ely. I also beg to inform you that the skull of a wild boar (*Sus Scrofa*) was found about four years since in a fen, called Burntfen, in the parish of Mildenhall, about six miles east of Ely. The lower jaw and the incisors, the tusks and two of the small teeth, are wanting. The skull is seventeen inches in length, six inches and a half in width at the cheeks, and three inches and three quarters at the insertion of the tusks; this skull is in my possession. — *Marshall Fisher; St. Mary's, Ely, August* 30, 1843.

Note on Black Mice. A few years ago I was riding past Hampstead-down wood, and heard a great rattling amongst the dead leaves, which I suspected was made by the snakes, but on looking up into the wood (which is situated on a very steep shelving hill) I was surprized to see a number of *black mice*, travelling gradually over the

fallen leaves in a regular line: they were probably collecting the hazel and beech nuts for their store of winter food.—*W. Hewett.*

Note on the Nest of the Harvest-mouse. I have been much pleased at finding the nest of a harvest-mouse within the last few days, corresponding exactly with White's description (Zool. 291). It was composed of blades of dry grass and wheat, and of an oval form. I was walking along a green road, about a mile from Ilsley, and observed at least eight of these little mice sitting basking in the sun, on the branches of the wild Clematis. On seeing me, however, they all ran away, being nearly full grown. After much search I discovered their curious nest, which was built in the boughs of the Clematis, about two feet above the ground. In the centre was a small orifice for the entrance, and at the sides two other lesser apertures, from which I conclude that Mr. White was right in his supposition, that the dam opens different places for the purpose of administering a teat to each young one, adjusting them again when the business is over. This conclusion he came to, not from seeing the smaller apertures (for these he had never observed), but because he considered that the dam could not be contained in the same nest with her young, which certainly seems impossible. The weight of one of these little mice which I captured, scarcely exceeded a drachm.—*Id.*

Note on the Harvest Mouse. Mr. Bell, in his 'History of British Quadrupeds,' mentions very few counties as the ascertained habitats of the harvest-mouse. I imagine it to be far more generally distributed throughout the country, although its appearance has not hitherto been recorded. To Mr. Bell's list of counties I can add Kent and Sussex; since in my native parish in the weald of Kent, adjoining Sussex, I have known the harvest mouse so numerous in wheat-stacks as to have committed considerable ravages, notwithstanding their diminutive size. I have repeatedly seen their nests in the long grass near the hedges of stubble fields, though I cannot, from recollection, speak confidently of any counties but the two above named. This little mouse is amusing in confinement. It is very cleanly, free from the offensive smell of the house-mouse, and will become tame enough to take flies (which it is fond of) or grain from the hands of persons it is accustomed to; but it makes its appearance principally in the evening. It eats like a squirrel, while sitting on a perch in the cage.—*Arthur Hussey; Rottingdean, Sussex, August*, 1843.

Note on the occurrence of the Harvest Mouse in Lancashire. Many specimens of this mouse have been found by the reapers during the last month, (September, 1843). When Mr. Thomas Chapman, of the Dungeon farm, Hutton, was erecting sheaves after his reapers, his attention was arrested by a peculiar sound issuing from one of them. On examination, this was found to proceed from the nest of a common field-mouse, as they are here called. It was situated about eighteen inches above the band of the sheaf, and contained nine young ones. He afterwards found two other similar nests, similarly situated, and both likewise containing young. They had been ingeniously constructed on the standing wheat (see the figure of the mice and their nest, Zool. 289) at a height of four feet from the ground. It is surprising that the wheat could be cut and the sheaves bound up without the reapers observing the nests, and without any injury being done to the little creatures or their airy habitations. Many of these nests have been found this year at Nateby, near Garstang, in hay-grass, as well as in the standing corn.—*M. Saul; Fort Green Cottage, Garstang, October*, 1843.

Anecdote of a Red Deer. As an instance of that wonderful spirit of sociality mentioned by White, I may mention that a fine red deer passed through this town with a regiment of soldiers, walking as stately and orderly as possible with the band, and ap-

pearing much delighted with the music. They informed me that this beautiful creature was bred up by the musicians, whom it always accompanied voluntarily. — *Wm. Hewett; East Ilsley.*

Note on the occurrence of the Red-legged Hobby near Norwich. About a fortnight since an adult male of the red-legged hobby was killed in this neighbourhood. The contents of the stomach consisted of beetles.—*J. H. Gurney; Norwich, August*, 1843.

Note on the Screech Owl. The country people hereabouts superstitiously fancy that the " screech owl," as they term it, attends the windows of dying persons; and I have often heard old nurses say that they thought the sick person would die, for they heard the owl beat against the window in the night. The fact is, these poor birds are attracted thither by the light, which is generally kept burning in a sick-room. — *Wm. Hewett; East Ilsley.*

Notes on the Rooks. It is a pretty and amusing sight, on our open downs, during the sultry days of summer, to see the manœuvres of the rooks. They all rise up in a flock, and, making a tremendous cawing, wheel round and round in the air with many successive circles, each time ascending in this spiral manner still higher and higher, so that at last they get to such a height as to be almost invisible; indeed I have sometimes seen them go quite out of sight. The noise of these birds, their numbers, and singular whirling motion, are altogether highly amusing. After having thus ascended to an amazing height, they successively become exhausted, when, discontinuing all exertion, they fall motionless to the earth with a fearful rapidity, as though hit by a bullet. When however within about twenty yards of the ground, they extend their wings, and alight in safety. A yeoman near here being desirous of forming a rookery on his estate, employed a poor man to construct several artificial nests, and fix them in the highest trees; which being done, the rooks of a neighbouring colony immediately forsook their old haunts and repaired to the desired spot, where they have ever since continued to build. Rooks in this neighbourhood, during the summer months, leave the hill country very early in the morning, and go to the vale, where they feed during the day, returning again at night to their former haunts, which are large coverts, where the trees are thick and high, and where also they never build. These immense flocks often extend more than a mile in length. In very hot weather rooks often roost on the tops of the highest hills on our open downs, so that when I have been riding at night, I have frequently found myself in the midst of an immense flock of these birds. I have known rooks at Farnborough (which is very high ground) frozen so as to be unable to escape, their wings being actually rendered useless by the frozen sleet, so that the poor birds fell tumbling to the ground on attempting to fly.—*Id.*

Note on the Royston Crow. The royston crow, called in these parts the " Chilton dun crow," annually arrives in this neighbourhood in October, retiring about March. This bird is very rarely seen about the hills or in the immediate vicinity of East Ilsley, whilst at Chilton, only three miles distant, and throughout the vale, they are common. When observed on the hills, or to the south of the downs, the country people predict a hard winter.—*Id.*

Note on Magpies, Jays and Crows. Many ferocious birds, such as magpies, jays and crows, show their anger by making a most terrific chattering; when any enemy such as a fox or human being, approaches their nest, which no apprehensions of dan-

ger will induce them to quit altogether. Crows, from making a great noise on the approach of an enemy, are encouraged by game-keepers to breed in their coverts, because they intimate by their hoarse cries the approach of any dog, cat or poacher, so that the keeper is soon on the alert. When however their young ones are hatched, the old crows are always destroyed, either by the gun or gin, as they prove very injurious by sucking the eggs of game &c.—*Id.*

Note on Magpies and Starlings. Magpies and starlings not only sit on the backs of sheep to pick out their ticks, but to observe the grasshoppers which the flock disturb as they feed, and on which these birds feast luxuriously.—*Id.*

Note on the Starling. I stood this morning for nearly an hour, watching a pair of starlings (*Sturnus vulgaris*). They had chosen a hole in a tree close to me for their nest, in the construction of which the female alone was engaged; the male sate near, looking on, but never fetching any materials; he seemed to be a sort of guard or sentinel, as he repeatedly drove off some sparrows that were too inquisitive as to the progress the nest was making. The female, in her arduous task, made on an average (by my watch) three trips per minute, with small twigs and bits of dry grass, which she picked up near the tree. Sometimes she took three or four small ones at one time; so that at this rate, supposing her to work for only six hours, she would have brought together upwards of a thousand sticks &c., which would be more than sufficient to form her nest.—*Beverley R. Morris, M.D.; York, April* 19, 1842.

Note on the Ring Ouzel. We see the ring ouzel every year in May, and again in the month of September, so that it appears to migrate from the south and the north on the approach of spring. This bird often breeds in Derbyshire, and I am confident also that it occasionally builds in these parts. Mr. White states that he shot a ring ouzel in May, having small rudiments of eggs in her, which would probably have been laid in a few weeks. Now since this neighbourhood is forty miles north of Selborne, and these birds tarry some days at every place where they halt, they would not arrive here till a fortnight after their appearance at that village, so that I am inclined to think that some of these ouzels, finding their time of laying nigh at hand, do not extend their journey any further, but remain with us to breed, as we know they have occasionally done.—*Wm. Hewett.*

Note on the Frugivorous Propensities of the Throstle or Song Thrush. Although this bird is resident in England, it is said to be migratory in France, arriving about the time of the vintage, and feeding greedily on the grapes, whence it has been called the vine-thrush. They are remarkably fond of ripe gooseberries, always selecting the largest; they pick out the calyx, thus making a hole, and without removing the gooseberry from the tree, empty it of its contents, leaving the husk only attached to the stem. I have found the thrushes easily caught by placing an iron rat-trap under the finest gooseberries: they are not at all afraid of the trap, but jump on the little table in the centre in order to reach the fruit more conveniently, and if it does not go off at once with their weight, it is sure to do so with their active movements as they keep on pecking away at the gooseberries. They also eat great quantities of plums and cherries, and early in the year I have known them scratch up newly sown peas. These birds are remarkably prolific, producing three and sometimes even four broods in a year. Finding that if I destroyed their nests and eggs they began building again immediately, I thought by taking the eggs out of the nest and dipping them in boiling water, their vitality would be destroyed, and that the bird would still waste the usual period of incubation; but I found they would not sit on eggs so served: and if some

were boiled and others not, they invariably broke the boiled ones and threw them out of the nest.—*M. Saul ; Fort Green Cottage, Garstang, August*, 1843.

Anecdote of a Male Blackbird building three Nests. Last year a male blackbird resided in my orchard, and, as it appeared, failed in finding a mate. As early as February he began building a nest under some long leaves by the side of a fenny place in the orchard, having first scratched away a little earth, in order to make a level place for the nest to stand on. When the nest was finished, it was completely concealed from the sight and protected from rain, by the long leaves bending over it; so close was one of the leaves, that the bird had to lift it up every time he went in or out, a feat I frequently watched him perform. About two weeks after this nest was completely finished, the same bird built a second in another part of the orchard; and in this second nest I often saw him sitting later in the season, and when the leaves were on the trees, he built a third nest in a thorn-bush. During the time he was engaged in these three nests, he would continually perch in one of the highest trees in the orchard, and send forth his rich and melodious song, as if to invite a partner to join in his family cares, but always without success.—*Id.*

Note on the Wryneck. The wryneck, or cuckoo's mate as it is often called, from its appearing about the same period of the spring as that bird, is not unfrequent in this neighbourhood. I have one stuffed, which I caught near Compton. The most singular part of this beautiful bird is its long slender tongue, which, being covered with a glutinous substance, is employed to catch ants and other insects. I have seen the wryneck standing on an ant-hill, and thrusting its long tongue into the mould to procure their eggs, which are its favourite food.—*Wm. Hewett.*

Note on the occurrence of a young Cuckoo in a Reed-warbler's Nest. Being in company with a friend on the 12th of June last, we had shown to us the nest of a reed-warbler containing a young cuckoo but recently hatched. This juvenile parasite was alone in the nest when we saw it, and had, without doubt, forcibly ejected the eggs of its foster-parent from the nest, as, on the preceding morning, it contained five eggs, in addition to the one from which the cuckoo was hatched; some of these eggs we discovered lying amongst the coarse herbage beneath the nest. — *S. Willoughby ; Bratoft, near Spilsby, Lincolnshire, August* 17, 1843.

Note on the Bunting. Mr. White seemed doubtful whether the bunting left England in the winter, which it certainly *does not*, for in these parts they are seen *throughout the year*. They breed here in summer, and in winter congregate in immense flocks, when they do great mischief by feeding on oat-ricks, and pulling out the straws, at which hundreds are annually shot by our rustic sportsmen.—*Wm. Hewett.*

Note on the Snow Bunting. From my own observation, and from the information I have obtained from attentive observers of Nature, I am led to believe that the snow bunting (*Emberiza nivalis*) may be considered a regular winter visitant to the shores of this neighbourhood. In proof I may mention that considerable numbers have arrived on the Skegness coast every winter for the last four years.—*S. Willoughby.*

Note on the Shrike. The red-backed butcher-bird or shrike is not uncommon in this neighbourhood. Wherever I have seen them there have been meadows, and green hedges, or bushes. During the summer months they feed on butterflies, and I have often seen them sitting on the topmost twig of some hawthorn hedge, watching for these insects, which, when they have caught, they return again to the same spot, and this they repeat many successive times.—*Wm. Hewett.*

Note on the Lesser Redpoll. The curious note of a bird mentioned by Mr. Duncan (Zool. 240), must be that of the lesser redpoll linnet (*Linota linaria*). The following observations respecting it may not be unacceptable to naturalists. In this district, the south of Yorkshire, they mostly migrate, very few remaining during the cold part of winter. In the month of March it arrives in considerable numbers, and is to be found in every plantation and garden, even close to the town. The plumage of the males is very bright; they are incessantly noisy, chasing others of their species with undulatory flight, uttering their trilling notes, which never amount to a song. About the beginning of April the happy pair select a tree, not being particular as to height, for I have found them in lofty forest trees as well as in low evergreen bushes; constructing their neat nest externally of small fibrous roots, lining it with fine grass, downy seeds and feathers. They usually lay five but sometimes six eggs, which are pale bluish green, sparingly dotted with reddish brown at the larger end. The plumage of the young is lighter than in the adult; it is more streaked and spotted, and they are also without the red feathers on the head and breast, these are acquired during the first moult. I have seen large flocks feeding on the birch and sycamore trees in October, every individual of which had a red poll of some tint. Their usual food consists of seeds of various kinds, intermixed with insects. At any time, particularly when feeding (which it does after the manner of the titmouse family), the lesser redpoll is quite unsuspicious of danger, and allows of a close approach. The species seems generally distributed. It is found in the United States of America, where it arrives in the winter from its breeding grounds on the northern frontier. A beautiful figure of this bird is in Audubon's 'Birds of America.' The old and young birds and nest of Linota linaria procured by me, are in the collection of my friend, who is now in search of specimens in the "far west" of America, for description in his grand work on Quadrupeds. — *John Heppenstall; Upperthorpe, near Sheffield, August*, 1843.

Note on a singular noise made by a Sparrow. In the spring of 1834, my attention was attracted by a singular noise in a cherry-tree under which I was passing, and the height being very trifling, I was able to satisfy myself that the noise proceeded from a cock sparrow, which was very assiduously paying court to a hen bird. I could not, however, ascertain positively how the noise was made, except that it appeared to be with the tail, which was rather spread, and moved rapidly in a lateral direction. The sound might be called a *buzzing*, more properly than anything else. This took place in a tree close to the house I was residing in, and I was so continually in the habit of passing under the tree without ever molesting the birds, which built in my house, that I had better opportunity of close observation than I ever enjoyed before or since, and I am convinced that the birds *must* have been *house* sparrows. However, I never heard the buzzing noise, except in the single instance now mentioned, of which I wrote down a description, not indeed at the moment, but shortly after, while fresh in my recollection. Mr. Bell has confirmed my idea that no record had been preserved of a similar occurrence having previously been noticed; but I trust that the publication of this in 'The Zoologist,' will excite sufficient attention to induce naturalists to watch, in the ensuing spring, for a confirmation or otherwise of my observation.—*Arthur Hussey; Rottingdean, Sussex, August*, 1843.

Note on the Nesting-place of Swallows. I was talking to a poor man at Aldworth point a short time since, and observed a swallow several times enter an out-house, on remarking which to the man, he informed me that there was a nest attached to one of the rafters, which I had the curiosity to go in and witness. He tells me that swallows

have built in the same spot for three or four years following. On the downs, swallows often accompany a horseman for many miles together, in quest of flies; flying very low, and watching attentively every step of the animal, which is a sure sign of approaching rain.—*Wm. Hewett.*

Note on certain Nests of the Swallow at Kelvedon. Last year a pair of swallows (*Hirundo rustica*) built their nest in an angle of the external walls of my house, about eight inches below the eaves, which, the house being slated, project a good deal: and this year a pair built their nest in the open roof of an out-house, on an angle formed by the rafters. In both cases the nest was quite open, and nearly flat. The young birds returned to the nest to roost, for several nights after they had taken wing; and occasionally during the day, when the old birds continued to feed them.—*John Atkinson; Layer Marney Rectory, Kelvedon, August*, 1843.

Note on the Nesting-place of the Swallow. In accordance with Mr. Hepburn's suggestion (Zool. 147), I have paid some attention to the places used by the swallow for nidification. They are not, in this locality, so numerous a species as either the martin or sand-martin, and this must account for the meagerness of my communication. A pair has this year nested in a chimney of my own habitation. I have strong ground for believing that the chimney of a house in the village of Hulton, as also one at Eyemouth (on the Berwickshire coast), have been used for the same purpose. I should add that persons resident in the neighbourhood, of whom I have made enquiries on the subject, appeared to be impressed with the belief that the swallow generally, or at least commonly, builds in a chimney. By one of them I was told that swallows' nests might be seen on the cliffs overhanging the Whitadder; but on examining the place mentioned, I found, as I expected, multitudes of martins' nests, but could not detect one swallow among the occupiers of those nests.* On Monday last, September 11, I discovered a swallow's nest under the suspension bridge over the Tweed at Paxton: it was attached to one of the transverse beams on which is laid the platform sustaining the carriage-way of the bridge. Unlike the martins', it was open all round, except at the part which touched the beam; and was perhaps an inch and a half or two inches distant from the platform. It was still occupied, as I think were one or two others on other parts of the bridge; and I have little doubt that earlier in the season several might have been found there.—*J. C. Atkinson; Hulton, September* 15, 1843.

Note on the Migration of Swifts. On the 30th of August, as I was returning by the "Sea-braes" to Eyemouth from St. Abb's head, I saw three or four companies of swifts evidently winging their way southwards. The first lot consisted of four or five individuals; the next of twelve or fifteen. One company loitered a little over a field of beans, but none of them remained long in sight. For the most part, their line of flight seemed to lie along the edge of the coast; for few of them ranged to any distance either seaward or inland. On the 31st one was seen, and on September 3rd I saw two over Eyemouth, and I think one or two others, at a short distance over the sea. Since the last date I have not seen any.—*Id.*

Note on the migration of Martins and Sand-martins. At St. Abb's head, August

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* This is not the colony already mentioned in these pages (Zool. 246), but a far more numerous one: the rocks, too, on which the nests are placed are much loftier, and the nests themselves placed at a much greater height above the river.

30, I saw a *few* martins, which probably had nests about the rocks there: * and two days since (Sept. 13) I saw a few more (six or eight) on the same coast, about six or seven miles south of St. Abb's, which I ascertained had nests, with young. With these two exceptions, I have hardly seen a martin for four or five weeks. Up to the middle of August I used to see great numbers of them whenever I went out, and especially when walking by the river. It is the same with the sand-martin: they were almost as numerous as the martins: and at one spot on the north bank of the Tweed, about a quarter of a mile below "Norham's castled steep," where a sand-bank above a quarry is perforated by their holes to the number of some hundreds, they really swarmed: but when I was there ten days since, there was not one to be seen, nor had I seen any at my previous visits to the Tweed for three weeks or more before that. What then has become of the great majority of the martins, and (as it seems) of all the sand-martins? Whither have they gone—and for what purpose? The swallows are still remaining, and in undiminished numbers, and seem to find abundance of food. The weather has been splendid, and the season unusually warm of late. In fact every thing would seem to have been adapted to induce them to prolong their stay.—*Id.*

Note on dates of migration at Kelvedon, Essex. For some years past I have been in the habit of noticing the period of arrival of a few of the commoner migratory birds, and have found the time to vary but very little. The swallow (*Hirundo rustica*), for instance, has generally appeared here from about the 15th to the 20th of April; and the martin (*Hirundo urbica*) a few days later. The cuckoo, the wryneck and the nightingale generally within a few days of the same time. Fieldfares were still remaining here this year almost till the end of May.—*John Atkinson; Kelvedon.*

Note on a singular locality for a Redstart's Nest. In the spring of 1841, I noticed that when I went to a particular part of my garden, a male redstart (*Motacilla Phœnicurus*) always appeared much distressed, which convinced me that its nest was close at hand, but I could not find it. One day, having occasion for a common flower-pot, not of a very large size, I took one which had been left inverted on a narrow path between two sea-kale beds. On lifting it up, I discovered a nest with five eggs, placed on the ground. I carefully replaced the pot over the nest, inclining it a little towards the south, so that when the sun was shining I could just discern the eggs through the hole at the bottom (now from its inverted position the top) of the pot. On passing it soon after, I found the hen bird was on the nest; and she succeeded in hatching and bringing up her brood; paying no regard to my looking down upon her as I passed by, if I did not stop.—*Id.*

Note on the Black Redstart. A correspondent (Zool. 101) enquires whether Phœnicura Tithys retains its black garb during the winter, as examples which he met with in Cornwall at that season were without it. Those specimens were, no doubt, in immature plumage. An adult male was shot a few winters ago, near Alverstoke, Hants, and is now in my possession: another was also shot by the Rev. C. A. Bury, last winter, on the 2nd of December, above the cliffs at Bonchurch. Both these specimens have the throat, neck and breast black; but while the throat is very glossy, the feathers on the sides of the neck and breast are slightly interrupted with slate-colour. The specimen obtained at Brighton in the month of March (Zool. 188), is described

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* See Mr. Yarrell's account of the martin; but for "Northumberland" after the mention of St. Abb's head, read "Berwickshire."

as being "remarkably black and bright." There seems no doubt, therefore, that although P. Tithys retains its black garb during the winter, the colour is less pure and jetty than in the breeding season, which we find to be the case with other black-throated birds, as the reed-bunting for instance, and also the cirl bunting (which is rather common with us), and thus the specimen obtained at Brighton so late as March, had probably assumed its full nuptial dress.—*J. F. Dawson; Ventnor, Isle of Wight, August* 18, 1843.

Correction of some inaccuracies in a prior communication on the Wood-wren. In the last number (Zool. 311), Mr. Briggs has given some remarks upon the willow and wood wrens, which are not altogether accurate; and I venture to send you a few lines on the subject. The three species, namely, the wood-wren, willow-wren and lesser pettychaps or chiff-chaff, are all common here, and I have had abundant opportunities of observing their habits. The wood-wren arrives the latest—generally in the third week in April, and always frequents woods, generally where there are tall trees, but is only locally distributed, as there are many parts of our woods and forests where they are never seen. They seem particularly attached to certain spots, and seldom move far away, and are very rarely seen in the open country, and never except at their first arrival, before they have attached themselves to a particular haunt, or after the breeding season, when on the point of departing. The nest is composed of dried grass, and *invariably lined with fine grass and hair, the bird never using a feather in the construction of its nest.* The eggs are white, thickly covered with *dark purple spots*, often confluent and forming a zone at the larger end. The willow-wren (*P. Trochilus*) is almost universally distributed, and always uses feathers to line its nest. The eggs vary much. They are mostly white, pretty thickly covered with pale red spots, but sometimes the spots are few in number, and I have seen them pure white. The lesser pettychaps or chiff-chaff (*P. rufa*), usually places its nest about a foot from the ground, in a bunch of old fern or low bush, and it is externally composed of a quantity of dead leaves and lined with grass and a profusion of feathers. The eggs are clear white, thinly speckled with *dark purple spots.—Henry Doubleday; Epping, August*, 1843.

Note on the occurrence of the Blackcap in January, (see also Zool. 76). Mr. White, speaking of the blackcap, says, "if these little delicate beings are birds of passage, as we have reason to suppose they are, because they are never seen in winter," &c.; but this is a great error, for I have occasionally seen them at that season, and this past January, 1836, I have seen several; so that *sometimes* blackcaps do not quit England during the winter period. I frequently see these delicate little songsters on the top of furze-bushes on the open downs.—*Wm. Hewett.*

Note on the pugnacious disposition of the Blackcap. The pugnacious disposition of the blackcap warbler has long attracted my attention: I now purpose giving a short account of an attack made by this bird on a wounded rabbit, together with a few other observations on its habits. In July last I had an opportunity of witnessing a more than ordinary degree of pugnacity in this delightful warbler. As I was shooting those destructive animals, rabbits, I wounded one severely; when endeavouring to escape it was immediately assailed by a male blackcap, which had been busily engaged in feeding its just-flown young; it repeated its assaults and loud vociferations in quick succession, until the rabbit had become motionless and stiff in death, when it instantly retired, apparently rejoiced at the victory it thought it had obtained over its more unfortunate adversary, and again resumed its parental duties with the assiduity of an affectionate parent. I could not help admiring the rash courage of so feeble a bird;

and thought of the wonderful provision which Nature has given to so many of its species, to protect their helpless charge from frequently impending danger. I have repeatedly seen the blackcap chase the greater and blue titmice when intruding on its precincts, with the greatest success. This songster is really a treasure to our groves and thickets. I have heard it pour forth its rich melodious strains for a full half hour, with little intermission, or without moving from its well-selected twig on the summit of some favourite tree or bush. Mr. Yarrell, in his 'History of British Birds,' says with regard to the variations in the song of the blackcap,—"like most other birds that are gifted with great powers of voice, the blackcap is an imitator of the notes of several others, and occasionally detracts from the character of his more natural song by the introduction of variations." This I can verify, for I have often heard the blackcap imitate the lower notes of the blackbird, some notes of the thrush, and others of the robin. Having never yet heard the song of that far-famed songster, the nightingale, a treat which I am anxiously longing for, I think the blackcap makes an excellent substitute, and if it would only tune up its pipes during the dead stillness of midnight, I have little doubt that it would be thought nearly equal to the nightingale. When the female of this bird is sitting, I have noticed that the male becomes more shy and restless, he rambles to the surrounding woods, and his song is more hurried and less sweet, and uttered only for a short time. The blackcap, after the young are able to provide for themselves, is most difficult of approach, and it is only with the greatest caution that the observer is permitted to take a view of this restless bird. — *Vivian Walmesley; Westwood House, September* 9, 1843.

Anecdotes of a Robin. A young lady was visiting here a short time since, and finding I was fond of studying birds, their habits &c., related to me an anecdote of a robin. I requested her to let me know, on her return home, the particulars more fully and accurately, as the circumstance occurred at the house of one of her friends, at a village near Norwich. I herewith send you a verbatim copy of her account; and if at all suitable for that excellent periodical, 'The Zoologist,' pray make use of it. In her letter to me my friend writes thus:—"I have just seen Miss D., and obtained from her the particulars of the robin story, and find it even more extraordinary than I had imagined, but you may rely on its veracity, for I committed it to paper immediately on my return, lest my memory should prove treacherous. The tale is this. In the spring of this year a robin entered the house, and commenced building a nest over the book-case, in Mr. D.'s study; but as they could not agree on the subject of cleanliness and neatness, she was forced to make her exit, and submit to the destruction of her little nest. The next day, much to the surprise of the family, she made her *debut* in the drawing-room, deposited an egg on the carpet, and respectfully withdrew; not however with the intention of quitting the house, for she boldly recommenced her work in a bed-room. The servant said she had turned it out several times, and more than once cleaned away the moss &c. which it had brought and deposited on the head of the bed. But no sooner had she quitted the room, than the dear little thing resumed its work; so that at last they were obliged to shut up the room to keep it out. During this time she laid another egg in the drawing-room. She then found her way to the store-room, and there, among the preserving-jars, once more attempted to take up her quarters: here she was soon discovered by her ruthless pursuers, who again bade her avaunt! She obeyed; but for several days she was seen hovering around her favourite haunts, but never again attempted to enter the house. What an example of patience and perseverance, equalling, I think, that of Robert Bruce's

spider! Another singular circumstance occurred to the same family this year. By the road-side they had a small box nailed to a gate-post, for the convenience of the postman, in which letters &c. *for* and *from* the post-office were deposited. The aperture in the lid is only large enough to admit a newspaper, but through this tiny portal a robin contrived to squeeze herself and building-apparatus, and made her nest, and was not discovered until she had well stocked it with eggs (I think it was said eleven or twelve, but cannot be certain). Upon opening the box it was found to be half filled with moss; this was cleared out and the box again closed. However, the next day, much to the chagrin of the kind-hearted gent., he found one of his letters partly pecked to pieces, and another pushed out of the hole in the lid, and lying some distance from the box. I suppose the dear little creature suspected the letters of treachery, and so vented her ire upon them, when she found her home pillaged and her little eggs gone." Such is the tale, which, as my friend writes, "though strange is no less true." Mr. Yarrell, in his admirable work on British Birds, gives us a very interesting anecdote of the love displayed by robins to a peculiar place to build their nest in. You will excuse me, I hope, for troubling you with this long letter; but having derived much pleasure myself from the above account, I fancy it may be interesting at all events to the *younger* readers of 'The Zoologist,' as illustrating a part of the economy of the robin's life.—*Frank Clifford; Elvedon Rectory, near Thetford, October* 2, 1843.

Observations on previous notes on the Grey Wagtail, (Zool. 136 and 230). As I was dressing one morning about a fortnight ago, my attention was attracted by the repeated passage of swallows (*Hirundo rustica*) close to my window. After watching them a few seconds, it became obvious that they were engaged in capturing the flies and other insects, which were basking in the sun on the walls of my residence. Very soon after I first noticed them, and while I was still standing near the window, one of the passers by caught sight of a small, rough, black fly (less than the common house-fly), which was resting on the inner side of one of the upper panes. At first I thought it would have tried to take the fly; but after a pause, seemingly occupied in closer observation, it passed on again. The same evolution took place several times, and with the like result in every case. On other parts of the window there were two or three gnats &c.; but of these the swallows seemed to take no notice. On the following morning, and indeed for four or five successive mornings, the swallows, at the same hour, were similarly employed: and again and again did one or other of them pause before the same fly (which I had now discovered was a dead one, though without any trace of external injury, fixed by its feet to the glass), but not one attempt was made to seize it. All the actors in the scene seemed, after a near approach, to be aware that such an attempt would be made in vain. I was strongly reminded by this scene of the actions of the grey wagtail already described, (Zool. 136, 230); and being a little sceptical on the subject of both the explanations there suggested, of such an unwonted proceeding, my doubts (as to the former at least) were now greatly increased. It appears improbable that a wagtail should *persevere* in attempting to seize an insect that existed only in its imagination, when a swallow, strongly attracted by a real fly, made not even one effort to take it from the glass: nor is the improbability lessened, if we take other similar cases into account. Thus the trout, having taken the artificial fly into his mouth, at once detects the cheat, and immediately ejects it if he can, that is to say, if he has not been hooked. But does he take it again the next time it comes over him? No! The angler may exert all his skill,—he may throw his fly, with the lightness of thistle-down, to exactly the proper spot,—but he never raises that trout

again which has once had a fair taste of the pseudo-food offered him: at least, not at the same time and with the same fly. Moreover, in a trout-stream which is much fished, the trout, after a while, refuse to rise at even the most tempting artificial fly which can be shown them: they have learned its delusive nature. Again, the birds which pecked at the Greek painter's grapes, did not prosecute the attempt to gratify their appetite beyond the first or second trial; if they had, we should never have heard the anecdote mentioned in proof of the excellence of the painting. Now if these birds learned by experience that a bit of painted — canvas I was going to say, but the ancients did not use canvas, I think — panel was not good for food, and desisted from their attempts to eat it; — if the trout quickly learns that an object which looks vastly like a drowning fly, is nevertheless not one, nor yet anything else fit to eat (and other analogous cases might be adduced); — it is, as I have said, surely questionable whether the wagtail, described as flying repeatedly against a window, did so in pursuit of an imaginary insect (Zool. 137), and that in spite of repeated discomfiture. Nor does the other hypothesis, namely, that the bird saw his own image, which "he took for a lost mate" (Id. 232), appear to carry more of probability with it. In early spring the wagtails* are seen in small flocks of ten or twelve, or sometimes more. In the course of a week or two they pair. In the summer they may be seen in family groups; but as the autumn wears on, the tie which once connected them seems to have been dissevered, and you see them more frequently alone than in company: nor do any facts relative to their natural history give room for supposing that the matrimonial compact remains in force after the last brood of nestlings has been sent to shift for themselves. Besides, supposing for the sake of argument, that the bird whose conduct is under consideration *had* lost his mate, and that at first he was deceived by the reflected image of his own form so far as to think it was his mate; yet, having detected the illusion by flying against the glass, he would scarcely have persevered in his futile efforts for days and weeks! It is observable, too, that in the earlier communication, the wagtail is spoken of as commencing its attentions to the window so early as the beginning of April. After continuing them six weeks, it absented itself for "a couple of months or more;" and was again seen "at its old station early in September," (Zool. 136). It is to be presumed that the eight or nine weeks of its absence were spent in nidification &c.: it must, therefore, have met with a mate somewhere. But if we accept the second hypothesis, this mate must have been the second that year; since by the beginning of April it was already looking out for one it had lost. Six weeks also were spent in the search. Other birds, we know from numerous facts, experience no difficulty in obtaining a new mate, should they have the misfortune to lose their old one. To mention but one instance, which occurred within my own experience. A pair of starlings had occupied part of a water-trough or eaves-drain to nest in. This might have occasioned inconvenience, and consequently one was shot: the survivor, within a few hours, formed a union with another. One of the second pair was shot, and with the like result. And if my memory does not fail me, no less than five new mates had been found by the surviving bird in the space of eight or nine days. How is it, then, that the grey wagtail alone should, on losing his mate, be compelled to live

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* By the river Wye, in Herefordshire, I used to see the yellow wagtail in such flocks in March; here, by the Whitadder and Tweed, I see the grey wagtail, and my remarks apply to both.

single for so long a time? Is it from inability to do as other birds do in this respect also? Truly it has good ground of complaint against us! for we go nigh "to write it down an ass;" and one, moreover, of no common dulness. But since facts are more convincing than argument, would it not be well to test the truth of the above suppositions by having recourse to experiment? Three instances of this strange conduct of the grey wagtail's have been already recorded in 'The Zoologist;' it is not, then, by any means improbable, that future instances may fall under the notice of some one who reads these observations. In such case might not something of this kind be tried? On the insect hypothesis.—A small fly or two might be fixed by means of gum (taking care to touch only their feet) to the window visited, and their places shifted from time to time. If the bird confined his (or her) attention to those parts of the window to which the flies were attached, and continued to do so notwithstanding their change of place, there would be good ground for thinking his appetite governed his motions. On the other hypothesis. — A pane of glass might easily be converted into a temporary mirror, by placing behind it some black substance: and each pane in turn might be thus treated. Then if the wagtail confined his inspection solely to the prepared pane, it would be obvious that he was attracted by the reflection of his own form. But, on the other hand, should he pay little or no attention to the insects or the looking-glass in preference to the other parts, or to one particular part of the window, it would seem that both the suppositions must be relinquished as untenable. When I commenced these notes I had no intention of proposing any new mode of explanation; but while writing, I have recollected an account I read some years since of a method of lark-catching practised in (I think) the South of France, which perhaps may afford a clew to the mystery of this habit of the wagtail's. A piece of wood, having fragments of looking-glass fixed to it, is made to rotate about an axis by means of a long string. When a flock of larks is seen, this instrument is set in motion; the birds, catching sight of it, appear to be as it were fascinated, and settle down on the ground near the object which has influenced them: they are then easily taken in the nets set for that purpose. Without attempting to account for the effect produced by this simple apparatus upon the faculties of the lark or enquiring in what manner it is produced, I would suggest that possibly the windows visited by the wagtails may have been accidentally adapted to produce a somewhat similar effect upon them. I am writing in a place at which I have no means of access to books, and therefore cannot give the references I otherwise would. I think I have seen a similar account in one of the series of Hone's 'Every-day Book.' Writing from memory I may have made mistakes, but I think I am, in the main, correct. In the second and more minute account, we find that the bird did not begin to fly against the glass until the blind had been drawn up; and this would seem to give additional likelihood to my suggestion. But I will not at present add more. The subject seems to me to carry much of interest with it, and to be worthy of close investigation; and I hope we shall yet hear that it has met with it. *J. C. Atkinson; Hulton, Berwick-on-Tweed, September* 9, 1843.

Anecdote of the Domestic Pigeon settling on trees. White says that the house-dove is very rarely seen to settle on trees, which is, I admit, generally true. A friend of mine, however, near here, has a pigeon-house close to some immense elms, which in fact overhang the building, and in the branches of which the pigeons are very often seen to settle on a sunny day. This I have myself witnessed, and have seen them pursuing one another over the larger limbs, and hopping from bough to bough.—*W. Hewett.*

Anecdote of a Peacock killed by a common Hen. The following is a verbatim

copy of a letter to a lady, a friend of mine, from her dairy-woman. "Madam,—I am very sorry to inform you one of the peacocks is dead. Yesterday he was spreading his tail, and a hen with a brood of young ducks was near him; and he caught one of the ducks and carried it several yards in his mouth; and when the hen heard the duck cry, she flew at the peacock, and struck him on the head, and he fell down and died in ten minutes. He is about five years old."—*Thomas Bell; Hornsey, Aug.* 26, 1843.

Anecdote of a Pheasant and Fox. A friend of mine shot at a pheasant and winged it, when his spaniels ran in pursuit of the wounded bird, which he saw running on the ground; but the pheasant had not gone far, before a fine fox caught it and ran off with it in his mouth across an open field, and although my friend rated him hard, and the spaniels followed in pursuit, the thief got clear off with his prize.—*Wm. Hewett.*

Note on the occurrence of Quails in winter. Whilst hunting on East Ilsley downs on the 12th of February, 1840, I put out a quail from a furze-bush, a most singular occurrence, as these birds generally emigrate in the autumn. This, I suppose, was some wounded straggler. I have, however, known other instances of these birds having been seen during the *winter*, and I have heard my father say that he has caught them under sieve traps in severe weather about Christmas, at Spoden, Oxfordshire. *Id.*

Anecdote of the Partridge. I lately met with a covey of young partridges in a turnpike road, one of which I caught; when the old bird, hearing the cry of the young one in my hand, flew fiercely at my legs, and struck at me as a common hen will do when she has chicken.—*Id.*

Anecdote of a Partridge and Fox. A sporting gentleman in this neighbourhood has informed me of an amusing anecdote, connected with a fox, which is somewhat similar to that mentioned in one of my former letters; and as the event occurred in the same copse, this was undoubtedly the very fox that exhibited his audacity on the previous occasion. My friend was shooting with a large Newfoundland dog, and killed a partridge in the covert from a covey of four or five: it had no sooner fallen dead to the ground, than a fine old fox seized the wounded bird, and ran off with it in his mouth, notwithstanding that the dog attacked him with great spirit. It is very evident that this animal, which is a fine old dog fox, is immediately on the alert whenever he hears the report of a gun in the covert, which he has frequented for a long time unmolested.—*Id.*

Note on the occurrence of a cream-coloured Grouse. About the middle of last month (August) a cream-coloured grouse was shot in the adjoining county of Northumberland. The bird, which was regarded as a great curiosity, was sent to be stuffed in Jedburgh, where I saw and examined it. The markings on the plumage were nearly the same as those of the common variety, the ground colour being a cream or light brownish yellow, and the markings of the same colour but darker. The quills and greater wing-coverts were of a bluish grey cast, as was also the abdomen. It was a young bird, and in rather immature plumage; the feathers on the legs just beginning to show themselves, and the head somewhat bare.—*Archibald Jerdon; Bonjedward, September* 2, 1843.

Anecdote of the common Fowl. During the past summer one of our hens chose to "lay away," as poultry-women term it, in a neighbouring plantation. Having, as we supposed, completed her number of eggs, she incubated and succeeded in bringing up two chicken. In consequence of having been so long a stranger to the restraints of the hen-house, she became nearly wild, and, with her progeny, which, of course, were completely unaccustomed to domestic habits, roamed the plantations and fields, never

however going very far from the vicinity of the homestead. One day towards the end of September, I happened to be walking with a friend, who was in search of game. Our setter, after snuffing for some time about the roots of a hedge dividing a barley-stubble from a pasture field, and in the neighbourhood of the haunts of the hen and her chicken, came to a stand-still. To our surprise the object of his point turned out to be the aforesaid hen and her young ones. The mother made off, running swiftly down the hedge, but the chicken crouched like partridges in the herbage at the hedge-root, and one of them actually took to its wings, when hard pressed by the dogs, and flew into an adjoining plantation. Several attempts were made to catch them, but in vain, as they generally shunned the sight of a human being, either running off as fast as possible, or concealing themselves in some hedge or other lurking-place: sometimes they even resorted to their wings in order to escape. As we found it impossible to domesticate them I was compelled to shoot them, which I accomplished the other day with the assistance of my setter, who pointed, and with some difficulty put them up for me from a hedge in which they were skulking. The old hen and one of the chicken took to their wings; the other refused to rise and was caught by the dog. — *Id.; October* 16, 1843.

Note on the Bills of Birds. Mr. Jesse in his ' Gleanings,' in mentioning the adaptation of the bill of birds to their method of procuring food, appears to me to have overlooked a distinction between the woodcock and the duck tribes. The former class, as he remarks, " probe " in the soft ground, (once in a severe frost I shot a snipe at a spring with a very small worm in its beak); and the circumstance of its bill becoming rough at the extremity when dry after death, favours the idea of that part possessing sensation. The duck however has a hard exterior to its bill, and feeds, not by " probing," but by *champing* (as it were) the wet mud between its mandibles, as if with a view of separating the edible from the inedible matter.—*Arthur Hussey; Rottingdean, Sussex, August*, 1843.

Anecdote of a Woodcock. This summer (1838) a poor woman discovered four or five young woodcocks at a spring in Fence wood, where I have several times known them picked up. When the woman went to this spring for water, the old parent birds would fly at her legs with great fury, the same as partridges will do when they have young ones.—*Wm. Hewett.*

Note on the common Snipe. Mr. Brown mentions snipes having been seen during the summer months, (Zool. 249). Now they are in the habit of breeding on Dartmoor every year, where the young ones are sometimes killed before they have got the powers of flight properly developed, in a most unsportsmanlike manner: and I believe they also breed in many other parts of the kingdom which are suitable for them.—*R. C. R. Jordan ; Lympstone, Devon, September* 18, 1843.

Note on the Golden Plover. The golden plover appears annually upon our open downs, arriving about the middle of November and remaining till the following spring, when it departs for those northerly regions where it is accustomed to breed. They always fly in large flocks, often as many as two hundred in number, called in sporting phraseology " a wing." I have occasionally seen them on our hills as late as March or April, at which time they are always in pairs, and are more easily to be approached. The flesh of the plover is of a peculiar but delicious flavour, affording a very choice dish when cooked (as I invariably have them) with the entrails in, and a toast under the birds. Although they are exceedingly shy and watchful in their habits, many are shot every winter during their sojourn on our hills, but it requires some little manœu-

vering and experience to get within reach of a flock, and no less so to know the exact time when to pull trigger, as they whirl swiftly round when on wing. As they fly very close together, if the flock is hit two or three generally fall dead to the gun, and I have killed no less than six at one shot myself. The best time of day to get near them, I have, after much experience, found to be either early in the morning or just before dusk. In the middle of the day they often leave the downs and go to the meadows and wheat-fields, where they feed on the larvæ which frequent those wet lands, and also for the sake of washing in the rivulets. About 2 o'clock in the afternoon they return to the hills and sheep-walks, always frequenting the same locality, which is generally the side of some open hill screened from the north wind, and where neither barns nor human habitations can be seen. In mild and rainy seasons plovers often remain with us until the latter end of February, especially if the springs in this neighbourhood are running, about which rivulets they are generally to be found.—*William Hewett.*

Note on the Eggs of the Stone Curlew. I yesterday found two eggs of the stone curlew on the bare fallows near Gore hill. They measured two inches in length and four in their smaller circumference, being in appearance much like the egg of the lapwing, that is, olive brown, with dark irregular blotches. The two eggs, however, differed much from each other; one being considerably larger at the greater end, more oval in shape, and darker in colour, than the other; they probably contained the rudiments of a male and female bird. They were deposited in a small hole on the fallows, but there was no nest of any description, and when picked up were quite warm, so that the old bird had just run off at my approach, though I did not observe her. *Id.*

Note on the habits of the Dottrell. The dottrell is remarkable for being a very foolish bird, on which account it is easily approached; I have, when on horseback, seen them in the fallow fields, lying on their sides, and scratching and shaking themselves till they were covered with dust; and yet they took not the slightest notice, although I was riding within three or four yards of the spot. These birds are very easily killed, as they are foolish enough to stand and stare at the sportsman till he approaches within a few yards of them; and if he raises his arm, they lift their wings, if he a leg, they do the same, of which I have been an eye-witness.—*Id.*

Note on the occurrence of the Buff-breasted Sandpiper at Yarmouth. I have much pleasure in making known to you the occurrence, near this place, of the buff-breasted sandpiper (*Tringa rufescens*), a fine specimen of which was shot on the 20th instant on the mud-flats of Breydon. It answers so nearly in colour and markings to the specimen described by Mr. Yarrell (British Birds, ii. 637), that a minute description of its plumage is hardly necessary. The feathers on the top of the head are dark brown, edged with a lighter tint: space around the eye a plain buff colour. The feathers on the back dark brown with light edges: the neck, throat and breast, buff colour tinged with brown: the under parts, thighs and flanks white, patched in places with buff. The under surface of the secondaries and of the inner web of the primaries, mottled in the way peculiar to the species. Legs and toes reddish brown. The bird had been observed for two or three days on the same piece of mud, in company with a ruff and a greenshank, the latter of which birds was killed at the same time with it. The sex was unnoticed.—*William R. Fisher; Great Yarmouth, September* 28, 1843.

Note on the occurrence of the Dusky Sandpiper in Cornwall. I have to report the capture, within the last month, of four examples of the dusky sandpiper, in the state of plumage answering to the description of the spotted redshank of our early authors,

which is, as your readers are no doubt aware, the plumage of birds of the year.—*Edward Hearle Rodd; Penzance, October* 14, 1843.

Note on the occurrence of the Spoonbill in Cornwall On the evening of the 13th instant, a flock of eleven white spoonbills was seen to fly over Hayle, in the western part of Cornwall; they were at length observed to alight in some marshy ground in the parish of Gwithian, on the north coast, a little to the eastward of St. Ives. Seven of them were shot, four of which I have had an opportunity of examining, and in their general appearance they display a more adult cast of plumage than either of the two Cornish examples which I have succeeded in obtaining before. The plumage of those at present under notice is free from any impurity in its whiteness, and there is a roseate blush observable in some of the dorsal feathers, towards their roots, this tint being especially apparent in, and as it were radiating from, the shafts of the feathers. Some of the specimens possess a much more extended bill than others, the excess amounting to an inch at least. The whole are without an occipital crest, or dorsal plumes, and it may be a question whether those specimens having bills so much longer than the others, may not be old birds in winter plumage. There is no yellow tint in any portion of the bills of any of the specimens; the colour being dark livid with a shade of flesh-colour.—*Id.*

Note on the Habits of the Dabchick. The little grebe or dabchick is a constant resident either upon the small broads or fleets on the marshes of this neighbourhood, or of the creeks and arms of the sea intersecting them, keeping during the autumnal and winter months in small flocks. Truly aquatic in habit, they seldom quit their favourite element, upon which indeed they can alone trust themselves in safety, or procure their living; there, perfectly at home, they ride and dive the live-long day; buoyant and light, they sit upon the surface of the water, or pursue their way below it with ease and speed. Upon the first appearance of danger down they go, and make for the sedge- or rush-grown sides wherein to conceal themselves, and where, if hard pressed, they will skulk among the herbage, with only their bill above water for respiration; and once alarmed, you no longer see them dancing cork-like on the ripple of the water,—they then, in common with other diving species, have the power of immersing themselves deeper, thus being a far less conspicuous object and safer from the gunner's aim. Sometimes when suddenly surprised, they appear from fright to be unable, at the moment, to seek safety in their usual and natural way by diving, but flack along the surface of the water, for some distance previously; yet incapable as they appear of locomotion, except in the element for which all their parts are so well adapted, they by some means or other frequently manage to surmount the tops of our sea-walls. Some days the little groups will be seen fishing in the creeks outside, none being about their inland haunts; the next day will perhaps find them transferred to the marshes: these frequent changes cannot possibly be effected except by crossing the walls, and are, I should imagine, performed by night. During the pairing season they are often seen taking short voluntary flights, or rather flackings, along the surface of the water. Their nests are placed in the thick water-plants or reeds growing upon the sides of the marshy waters, and consist of a large quantity of material,—flags, reeds, or any aquatic plants, sometimes of rushes broken into short pieces, and built up on a solid foundation from the bottom, to six inches or a foot above the surface, subject to variation from the rising or wasting of the water. Upon the top of this fabric are deposited from four to six eggs, perfectly white when first laid but soon stained by being in contact with the moist plants, so much so that they may frequently be seen of a dark

brown. When the complement of eggs is nearly completed, they are carefully covered over, but the birds are not so particular at first, as I have often seen nests with one or two eggs in, left uncovered; afterwards, and during the time of incubation, they are concealed by a larger covering, not, as Professor Rennie tells us, of dry hay, which is often a scarce commodity in the dabchick's haunts, but with the water-plants or rushes growing by; and one plant, the water crow-foot (*Ranunculus aquatilis*) appears to be a favourite with them for this purpose. I have seen the eggs covered with this, when the birds must have taken great pains to procure it, as none was growing where the nest was built, or nearer than an adjacent pond, to obtain it from which they must have crossed some dry land. From the quantity of material used for this covering, and the extreme rarity of ever finding a full complement of eggs without it, it is obvious that it is not always hastily placed on when quitting the nest; it must be the work of time to do it, and the covering is allowed to remain, the bird performing her duties of incubation upon the top of it, a situation I have sometimes surprised them in, when plump, in a second they go into the water and are seen no more, leaving behind them no more appearance of nest than a lump of weeds: upon these occasions I have often found both the eggs and covering quite warm, the former far advanced towards hatching.—*Christopher Parsons, F.L.S.; North Shoebury Hall, Essex, October* 12, 1843.

Notes on the occurrence of the Arctic Tern, young and adult, in Lincolnshire. On the 15th of July I visited the Skegness coast, and was much gratified in discovering at a place called Gibraltar point, several nests and eggs of different species of tern, as also in procuring two beautiful adult specimens of the arctic tern with their young. This species, of which Mr. Yarrell has given an excellent figure and description in his 'History of British Birds,' a work which ought to be in the possession of every ornithologist, appears to be rather plentiful than otherwise in the above-named locality; associating with the common and lesser terns, amongst which it may readily be distinguished whilst on the wing, by its rather slower and more stately flight, as well as by its peculiar note, which is a single harsh scream, repeated at short intervals, being a marked contrast to the clamorous cries of the other species of tern. The nests of these birds consisted merely of a slight depression in the sand of the open beach, just beyond reach of the tide, scantily lined with small fragments of bleached or glittering shells, and contained in every instance but two eggs.—*S. Willoughby; Bratoft, near Spilsby, August* 17, 1843.

Note on the Northern Diver. A few weeks ago, my uncle, Mr. Edmonston of Buness, shot a young bird of this species (*Colymbus Immer* of the older writers), which was evidently a bird of this year, the quills being almost unformed, and the bird, in short, being scarcely fledged; this proves that the northern diver breeds in Shetland, a fact I have long suspected. The specimen alluded to was killed from a company of five individuals, two of which were old birds, and three similar to the one procured. The old birds are seldom seen in winter, but the young or immers are then abundant. The dingy grey of the immer appears not to be fairly changed into the beautiful markings of maturity until the third or fourth year.—*Thos. Edmonston, jun.; Baltasound, Shetland, September*, 1843.

Notes on Birds injurious to Agriculture, and on the Benefits also derived from them. By ARCHIBALD HEPBURN, Esq.

(Continued from p. 309).

BLACKBIRD. — Perhaps I ought to include the dusky merle in this list; for I often remark him feeding on oats in the stackyard, or on those which have been scattered before the dining-room window, when wintry snow-storms howl around. Perhaps the poor birds find such fare better adapted for keeping up their animal heat than the coral berries of the holly which always abound in our garden.

The Titmice. The ox-eye, blue and cole tits, are much given to feed on wheat and oats during winter; but I am well aware that they are, at the same time, on the look-out for insects, larvæ and pupæ. For hours together I have seen them peering into the sides of bean-stacks; upon the leaves and stems of this legume Aphides often swarm to a great extent. Last season they abounded on our oats, and these tiny foes were preyed upon by a flesh-grub, which Mr. White, of the British Museum, assures me belongs to the Dipterous genus Syrphus. Moreover, on the approach of cold weather a multitude of flies (*Musci*) retire into the sheaves in the fields, and into the sides of stacks. Thus we see that even whilst these useful birds are claiming a few grains of corn as a reward for their summer researches in woods, gardens, and hedge-rows, they are on the look out to destroy our insect pests. The ox-eye and blue tits are very partial to green pease in gardens, but I have not observed them feeding on the field variety, which is much coarser.

The Raven. The primæval forests which covered the surface of this country, have long since disappeared, and in this neighbourhood we have no traditionary raven's tree. The lordly bird is confined to the range of the Lammermoors, and to the rocky isles lying off the North Berwick coast. They are few in number, and I never heard any complaints of their ravages from shepherd or housewife.

The Hooded Crow only occurs as a rare straggler in our inland parts. When scouring Tyne sands on horseback, I often observe it feeding there. It abounds along our coast from Prestonpans to Gulane point, at least in the autumn. Nobody but the gamekeeper has an ill word to say against this crow; and its name would not have appeared in

the present list, had not my friend Professor Macgillivray enumerated grain as being an article of its diet, in his excellent work on British Birds (i. 532). It joins the rook and other friendly birds in searching after the insect foes of the farmer; but with us its chief subsistence is obtained on the sea-shore.

The Carrion Crow haunts our fields in pairs throughout the latter months of autumn and winter, until the return of sweet spring recalls him and his dark mate to the upland plantations and hill-sides, where they rear their young in comparative safety. On returning from their summer quarters, they add grain to their bill of fare. I accuse them of occasionally digging up the winter-sown wheat, but whether to partake of larvæ or the germinated grain, I cannot tell. Almost every spring a pair or two attend pretty closely upon our flocks during the lambing season; and although I have ever looked upon them with suspicion, since reading Mr. Hogg of Stobohope's interesting account of the severe losses they inflict upon the Peebles-shire store-masters, (see Macgillivray's 'British Birds,' i. 521), yet I have not been able to bring any charge of murdering ewes and lambs against them, nor am I aware that our hill shepherds bear them any grudge on this score. They are great favourites of mine, and I really wish they were more numerous, for the *Laird* and his keeper are well able to fight their own battles. No one who has ever marked his noble mien—his courteous bowings to his mate before making the woods ring out with his joyous cawings, can resist admiring the bird around whose life and conversation prejudice and ignorance have thrown a dark cloud.

The Jackdaw. No jackdaws haunt the ruined piles in the neighbourhood of this farm; nor do they visit our fields in any considerable numbers. In company with the rooks I have observed them pulling up young wheat, barley and oats, and plundering the stacks in summer and the corn-fields in autumn. I have never seen the jackdaw digging potato-sets, and upon the whole I consider him a useful bird, and wish I were better acquainted with his habits.

The Rook. During open weather in winter, the rook subsists upon such insect food as the plough turns up, or can be found in pastures and beneath the droppings of cattle; but when hard weather comes, he haunts the stack-yard, and gleans nutritious particles along the roads, and from the dung-hills which the provident farmer now forms in his fields for next year's green crops. The famished birds congre-

gate in our turnip-fields, and with their strong bills dig holes into the valuable tubers, which do not long survive this rude treatment; the Swedish variety seems to be their favourite. The wild oat (*Avena fatua*), a most obnoxious weed, abounds to an injurious extent in some parts; it ripens and casts its seeds before the sickle is put to the crop, and these lie in the ground till circumstances are favourable to their germination, and the most careful tillage fails to eradicate them. I am credibly informed that rooks have at times seriously injured fields of young grass, by stocking up the red clover plants to get at these oats; but I have often seen them thus engaged in fields where the wild oat was unknown; perhaps they were searching for larvæ. Rooks are much addicted to pulling up all the cultivated Cerealia and field-beans, shortly after their appearance above ground. I once observed them do signal injury to a field of wheat, by pulling up the sickly plants, which were suffering from the dreaded ravages of the Chlorops pumilionis, or some allied species. On examining the plants pulled up, I found the larva untouched in its narrow cell, near the neck: I suspect that the rooks expected to have found *noble* game at the root of the plant. Though the larva is almost sure to perish when its nidus is thus exposed to the vicissitudes of the seasons, still I would gladly dispense with the officious interference of the rook; for though the main stalk of the plant always perishes, yet, under favourable circumstances, fresh plumules spring from the neck of the plant, which in due season clothe the ravaged portions of our fields with a vigorous vegetation. When clearing off the last of the turnip-crop in March and April, an immense number of larvæ are turned up by the plough. A large fleshy caterpillar, which often inflicts severe injuries on the bulbs of this valuable crop, and which my kind friend Mr. A. White, of the British Museum, informs me belongs to a species of Agrotis, a root-eating genus of moths, affords them a dainty and abundant fare. At this season the rook renders the farmer valuable service, in searching the oat-fields and overturning clods and bits of turf in quest of wireworms, the larvæ of craneflies (*Tipulidæ*), &c.: and for such labours we cannot feel too grateful. His attacks on the potato-field rouse the whole rural population in arms against him, as all, or at least most, of the farm servants in the county get a piece of potato-ground in part payment of wages: and many maledictions are heaped on his head by the labourer, who has children to provide for as well as the rook, which, once fairly bent on plundering a field, will never cease its attacks till driven away by the gun or rattle of the watchman, who, if he intermit his vigilance for a time, is sure to have his

charge invaded. No sooner do the tender leaves appear on the top of the drill, than the rook digs downwards to get at the remains of the set, or the young tubers, as the case may be; and as the young stalk gains strength, the thief seeks its help to dislodge his prey. The crop is never safe from his ravages until the plants are large and strong, and the roots and tubers are well protected by being earthed up. I do think that rooks must labour under a scarcity of food about the beginning and middle of summer, for they attack stacks with a voracity very far surpassing that which they display in wintry snow-storms, and that, too, in the most knowing manner. When a stack is stripped of its thatch, the top or peak is the only part where the ears of grain are intentionally exposed; and it is here that the sagacious birds dig through the thatch and riot in the prize, and by so doing expose the whole structure to the injurious rain. If the coast is dangerous, they carry off an ear or two at a time to some quiet place, returning again and again for a fresh supply. Do rooks prefer potatoes to every other food? — is a proposition which I beg to offer to out-door naturalists. The data supplied by my own note-book, are too few to enable me to draw a satisfactory conclusion. This season our potato-crop never recovered the effect of the heavy rains which fell between the middle of May and the end of the second week in June, and the fields required to be protected from the rooks until the end of August. Again in October, 1839, just when we had finished carrying the potato-crop, a long succession of wet weather prevented the ploughs from entering the field till the January following; during all that period a considerable quantity of gleanings lay exposed on the surface untouched by the rooks, and none were ever seen to alight on the field, which stretches away in front of the farm cottages. In the end of July, when the hay-harvest is finished, the seeds of rye-grass scattered by the side of the largest ricks afforded them a choice supply of food. When the grain begins to ripen in August, they feed on oats and barley with avidity, wheat not being held in such esteem. Their fondness for barley is commemorated in a local district: they also partake of carrion at all seasons of the year. On the whole the rook must be numbered amongst the farmer's best friends: it is too true that his ravages at times pull hard upon one's purse-strings, but who can estimate the benefits which he confers upon our labours? In proportion as a true knowledge of our insect foes increases, so much the more will the unjustly maligned rook rise in our estimation. I regret that candour obliges me to say so much against him, whilst at the same time I acknowledge my inability to do justice to his merits.

The Magpie. Although the magpie occasionally pilfers grain from our stacks in winter and spring, I have not seen him partake of such food when insects and their larvæ, worms and mollusks, can be procured in sufficient abundance, and by their destruction he renders good service to the husbandman. For these kind offices, the liveliness of his manner, and beauty of his plumage, I wish the race were more numerous. It is, perhaps, owing to their comparative scarcity in this county, that I never hear any complaints from the hen-wife.

The Jay. To my great regret the beautiful jay has been exterminated from this immediate neighbourhood, but it is by no means uncommon in some of our denser woods and plantations. Fields of pease or ricks of the same, in hard weather, constitute the only inducement to leave its woodland shades, to live on the produce of man's labour. Its insectivorous propensities are well known.

The Starling breeds with us in sparing numbers : old buildings and hollow trees being alike scarce. About the autumnal equinox, the flocks which range our pastures appear to receive a considerable addition to their numbers. During snow-storms they forsake the interior for the sea-board fields. Having seen it mentioned that they feed in the Hebridean stack-yards, I have made diligent though fruitless enquiry to ascertain whether they ever do so in this country. It is one of those pre-eminently useful birds which ought to meet with the greatest encouragement. Some years ago a flock which haunted our fields roosted for two successive nights in a holly hedge in the garden.

The Ringdove. To trace the gradual dispersion and colonizing propensities of some birds, is a subject well worthy the attention of field naturalists resident in Scotland, where extensive draining and planting have produced great amelioration in the climate, and variety in the productions of our fields. The ringdove or wood-pigeon was extremely rare in East Lothian about the end of last century, where it now swarms to a most injurious extent. In the appendix to the third volume of Professor Macgillivray's 'British Birds' (p. 700), will be found the reasons which I thought had led to this astonishing increase: * more extended observations and enquiries in other counties where similar improvements are being carried on, have since confirm-

* 1. The great increase in the cultivation of clover and turnips, which afford them a constant supply of food during winter. 2. The great increase of fir-woods, which are their delight, both for roosting and rearing their young.

ed the accuracy of these views. Assembling in countless flocks in winter, they forage in the stubbles until the grain is exhausted, when they attack the leaves of the young winter wheat, the Swedish turnip, the red clover or trefoil; the latter, when it is not killed, as is often the case, suffering most from its ravages. A small party will now and then visit the stack-yard in quest of beans or pease, even until late in the spring. When the pea and the tare appear above ground, they are attacked with fatal severity; and no sooner has the valuable Swedish turnip put forth its second pair of leaves, and just escaped the ravages of the turnip-flea beetle (*Haltica nemorum*), than it is speedily stripped of everything but the bare stalk by this greedy bird. When the fields assume the golden tints of autumn, they once more assemble in vast flocks, and ravage the crops of wheat, oats and barley, the two former being preferred to the latter; unless the beans, tares and pease ripen before they are cut down, which rarely happens, they are safe for a season. The cultivated legumes appear to be their favourite food. Before the crops are reaped, these birds seek out some portion which has been laid or bent, always, where practicable, keeping near a hedge-row, or trees, or a plantation. To this place they will return day after day, even although they are repeatedly driven off, when they become exceedingly shy and vigilant, rising simultaneously from the corn on hearing the least noise, and either alighting on the hedge-row, or on a neighbouring tree, or fly off to some distance. Where the corn-stalks are not sufficiently bent to allow them ready access to the ear, they alight amongst them in a peculiar way, so as to obtain the end in view. Like all other granivorous birds, they eat wheat which has been steeped in a strong solution of brine previously to sowing, with much relish; indeed I am almost entitled to assert that this pigeon gives it the preference. During the dead months they feed and roost together in large flocks, but at other seasons the flocks consist of an aggregate number of individuals, liable to be dispersed by the least noise. It is one of the prettiest sights I know of, to mark the gradual formation of these assemblies; now, as they leave the upland woods, they advance on rapid whistling pinions, and anon, with outstretched wings, describing those graceful risings and fallings for which their flight is remarkable.

The ringdove is undoubtedly the most destructive bird to the interests of the British farmer: and it would be well if active steps were taken to reduce their numbers: but I cannot dismiss its history without doing justice to its merits, which seem to have been overlooked by Mr. Waterton, in his delightful 'Essays on Natural History.' Often

have I remarked that when unkindly weather in spring arrested the growth of some of our white corn crops, allowing the hardy wild mustard to overtop the tender blade, how assiduously the pretty ringdove hastened the destruction of the weed by stripping its every leaf. And there, too, is the lowly chickweed (*Stellaria media*), so troublesome in some soils, for weeks its well-filled capsules furnish an abundant repast. Time will, I trust, enable me to add to this short catalogue of the benefits which it confers on rural labours. There are few woodland voices which delight me more, — few powers and graces of flight which I love better to see; but their countless numbers and frightful ravages steel the mind to their destruction.

The Pheasant. Viewed in all its bearings the introduction of the pheasant into Great Britain must be considered a great curse. How has its illegal destruction swelled our criminal list; and what a powerful, legalized instrument of oppression its maintenance becomes in the hands of an unfeeling landlord! So sensible are some of our kinder-hearted proprietors of its great ravages, that they pay the hire of a watchman, till the fields of winter wheat have outgrown its cupidity; an honest regard for the rights of others worthy of all praise and imitation. Fields of red clover are often irreparably injured, and many turnips spoiled, in the neighbourhood of the pheasant's winter retreats. Before the arrival of spring seed-time their numbers are well thinned, so that their ravages in newly-sprung fields of beans, oats and barley are not so noticeable: moreover, the insect world then attracts their attention. The old female often leads her brood into corn-fields, where they remain till harvest. Beans, when sown in drills, as they usually are with us, seem to afford them a choice asylum: judging from the flocks of song-thrushes which affect such situations in autumn, insect food must be abundant. Personal observation does not enable me to say anything in praise of the pheasant, touching the destruction of injurious weeds: and I must conclude this short account by stating, that next to the ringdove, the pheasant is by far the most destructive of our native birds. Where extensive preserves exist, few of these birds would survive the rigours of winter unless regularly fed; and this very act places the conduct of their owners in a very equivocal light, and consequently their misdeeds are looked upon with an evil eye, when the grievance remains unredressed.

The Partridge is a brave little bird; and though chiefly supported on the produce of our fields, yet he scorns to partake of our bounte-

ous stores. Snow-storms may sweep every little bird from our hedge-rows, yet how very rarely does this pleasant bird join the congregated thousands in the stack-yard. His call-notes and lively manners give animation to our fields at all seasons, and the bird is one of my first favourites. Though fond of turnip-leaves and their bulbs, and young clover and grain, yet he is not prone to settle upon the sheaves, but is content to glean amongst the stubble. It seems to be very fond of pease and beans, and subsists largely upon insects and their larvæ; indeed its young cannot exist upon any other food, at least when they are reared under a barn-door fowl. Nor do its good services end here, for at all seasons it feeds largely upon the seeds of Polygona, and many other injurious weeds which I am unable to name.

The Quail is by no means common in this district; only one specimen has come under my dissecting-knife, and the contents of its stomach entitled it to be ranked among our useful birds. It was shot during the month of May. I have seen specimens that were shot in Clydesdale so late as the month of September; and its call-notes are occasionally heard in our fields about the same time. Being a migratory bird, and only occurring in sparing numbers, it cannot do much damage to our corn-crops; whilst the benefits which, like many other birds, it confers upon us, are *legion*.

The Black Cock and Red Grouse occasionally frequent fields of oats in the neighbourhood of their haunts, on the lower slopes of the Lammermoors.

The Water-hen. The timid gallinule is fond of searching stubbles in the neighbourhood of its haunts, upon the gleanings of which it fattens amazingly. The stack-yard possesses many attractions for it, but I am not aware that it feeds upon growing corn. Some years ago a lonely individual annually left the society of its fellows, took up its abode on the banks of our mill-pond, and rambled about the garden and stack-yard, till it was unfortunately killed by a man who was ignorant of the estimation in which it was held by every one about the place.

The Wild Goose. Small parties of some species of goose, probably the short-billed grey goose (*Anser brachyrhynchus*) or the bean goose (*A. segetum*), often alight in our fields of winter wheat and young clover, and do them much damage by grazing on the tender blades. In

places where they abound they are a great nuisance, as about Tranent and Gladsmuir, where common rat-traps are often set in their haunts. The same method of capturing them was many years ago successfully practised in this neighbourhood, when they were more abundant.

The Duck. I have seen mallards leave the sea at the mouth of the Tyne in broad day-light, and settle in fields of oats growing on land which had been reclaimed from the sea by the Earl of Haddington. In their well-known nocturnal excursions into barley-fields, they only feed, so far as I am aware, on the gleanings.

Common Gull. I am credibly informed by several of our ploughmen, that having once left a few drills sown with beans, uncovered for two or three hours, on their return they found that a flock of common gulls had carried off a large proportion of the seed. Prof. Macgillivray, in his 'Manual of British Birds,' mentions that this species feeds on grain. These petty pilferings are not generally known, and I never yet knew a farmer who did not hail their presence with delight.

I have remarked that other writers have laid much stress upon the supposed damage which newly-sown fields sustain from rooks, pigeons and small birds; and many farmers, especially those residing in the neighbourhood of towns, are careful to protect the ground. But if the harrowing is properly attended to, all this care is unnecessary, seeing that none of the above-mentioned birds are given to scraping, and they ought to be permitted to enjoy the uncovered grains in peace. The injuries which some birds inflict on our crops, are too apt to attract our attention, and we are prone to forget their services. But I fondly anticipate the period, when ignorance and prejudice concerning their habits is dispelled, that they will receive greater protection and encouragement. I should be delighted to read a similar series of remarks, drawn up by some of the English correspondents of 'The Zoologist;' for it is only by pursuing such a plan, that we can ever attain to a correct knowledge of the injuries which we sustain from birds. From what has been stated, I think no one can help remarking the influence which local agricultural practices exert upon the birds inhabiting the district. The classic White recognized this grand principle: — "Every kingdom, every province, should have its monographer."

ARCHIBALD HEPBURN.

Whittingham, E. Lothian,
October 4, 1843.

Note on the Changes in the Plumage of the Honey Buzzard.

By William R. Fisher, Esq.

Although the honey buzzard has been long known as an occasional visitor to this country, and many specimens have consequently been taken, yet the intervals at which it makes its appearance are so uncertain, and the plumage of examples captured at the same time (for it generally arrives in small flocks) is frequently so different, that the changes through which it passes are still a matter of dispute amongst ornithologists.

The most certain way of ascertaining the nature of these changes, and the order in which they succeed each other, is by bringing up young birds, and watching the effects of the various moultings. Thus Colonel Montagu discovered the ringtail to be the female of the hen harrier; whilst the latter bird was distinguished from the ash-coloured, or, as it is now generally called, Montagu's harrier: and by somewhat similar means, several of our birds, which had been previously divided into two or even three different species, have been shown to be the same, and the difference in their colours has been proved to arise from certain periodical changes, or from difference in age or sex. Amongst these the dunlin and the purre have been identified, and the mountain and tawny buntings have been shown to be the snow bunting in immature and intermediate states of plumage. But as the honey buzzard has, I believe, never, except in the instance recorded by White of Selborne, in the year 1780, been satisfactorily ascertained to have bred in this country, British ornithologists are deprived of this means of watching the changes by which it ultimately assumes the adult dress. For even if it were possible to procure the eggs or young from those countries of the East to which this species is said to be indigenous, the process would be so tedious and expensive, that few naturalists would be willing to undertake it; and the difficulty of rearing young birds, and the many casualties to which they are subject during the process of moulting, are well known. A comparison of the different specimens taken from time to time in this country appears therefore to be the only method by which this object can be attained; and as the pages of 'The Zoologist' afford an excellent opportunity of making such a comparison, I have made drawings of such specimens as were within my reach, which, with descriptions of the birds from which they were made, I now beg to enclose. And I hope that if some of your numerous correspondents will, as far as they are able, do the same, some light may be thrown upon the natural

history of this rare and beautiful species. Four of the birds figured were taken in this county in the month of September, 1841 (Zool. 180), and are consequently fresh and in good preservation. I am aware that some ornithologists do not consider the white colour upon

the breast and belly to distinguish the adult bird, but as the specimen which I have figured in this plumage, and which is in the Norwich Museum, is marked "Adult male," I shall consider it as such, and beginning with the darkest specimen, shall endeavour to trace from it to the former, the somewhat intricate changes in the disposition and colour of its markings, to which the honey buzzard is subject.

FIGURE 1.

The bird from which this drawing was made was shot at Yarmouth, in September, 1841, and is in the Museum at Norwich. It is of an

almost uniform dark clove brown. There are a few lightish spots about the neck and shoulders. The quill-feathers are almost black. and the tail has three bars of very dark brown, the spaces between which are divided by narrower bars of a lighter tint than the former, but darker than the ground colour of the tail itself. It is labelled "Immature."

FIGURE 2.

This specimen was shot in the same year as the last, at Honingham, in Norfolk, and is also in the Norwich Museum. The uniform dark brown plumage of the last bird is here broken into patches of a more yellowish tint. The head, breast and belly are of a light brown, with streaks and blotches of a darker colour. The wings dark brown with light tips. The quills, which are nearly black, have also light tips. The tail is almost like that of the last, but of a more yellow brown, with a light shade of which colour it is also tipped, and the latter mark is found in all the remaining birds.

FIGURE 3.

This bird was taken at Yarmouth, in the same year as the two that precede it, and is now in my own possession. The feathers on the top of the head, and the neck, are dark brown, with light tips, giving these parts of the bird a mottled appearance. The space between the beak and the eye, and around the eye, is dark ash grey. There is a large patch of dark brown on the breast, and the patches on the thighs and under parts of the last specimen, are here broken into bars. The wings are also tipped with light brown, which, upon the quill-feathers and secondaries, approaches to white. The tail resembles that of the bird last described.

FIGURE 4.

This figure is from a foreign specimen, now in the possession of Mr. Heysham, of Carlisle: it was said to be a male. The whole head is of a light ash grey; the beak and wings dark brown tipped with a lighter colour; the quills tipped with light brown; the whole of the under parts and thighs white, barred with brown. The tail is nearly like that of the last, but has a fourth bar, or rather several patches in the form of a bar, on the upper end; it is tipped with light yellow brown. Birds in this state are, I believe, considered by some (as far as regards the head) to be varieties, and are distinguished by the name of "capped buzzards." But may not the grey head, which has given rise to that name, be one of the regular changes incidental to this species? I do not see why it should be considered as a mere accidental variety, more than the barred plumage, with which it is equally well known, and appears to be usually found. For I think that in the accidental varieties (by which I understand varieties produced by change of food, or domestication, and which cannot be traced to any periodical change of plumage), which occur in the colour of birds, the

change is usually produced by the assumption of an entirely new tint, and very seldom by the spreading of any colour which belonged to the individual in its natural state. Still less frequently does it happen that the head, or any particular part of a bird, undergoes an accidental change, leaving the remaining parts in their natural plumage. Thus we occasionally find the starling, the blackbird, the sparrow, and several of the other finches, in a wild state, entirely changed to a white or cream colour, of which little or none belonged to the bird in its natural state. But instances do not occur in which the blue bars have spread over the whole wing of the jay; nor do we find that the whole head of the gold-crest ever assumes the bright yellow colour from which the bird derives its name. Although marks and spots vary in the depth of their tints, becoming in some species darker, in others brighter, according to the age of the bird, yet Nature seldom permits them to vary in size. She "has set them their bounds which they cannot pass." But to return to the capped buzzard. The specimen figured appears to be in the perfect barred plumage, which, as I have already hinted, there seems some reason to suppose to be attained simultaneously with the ash-coloured head. The bird described and drawn by Bewick, is in nearly the same plumage as this bird, and he says that "the head is large, flat, and *ash-coloured.*" Buffon says too that the head is large, flat, and of a grey cinereous; but he does not describe the rest of the bird. Some of your correspondents who may have met with specimens of the capped buzzard, can perhaps inform us if they correspond in other respects with this. If so, a question arises as to the age of the bird in this state of plumage — and whether the grey head is common to both sexes? The example in my possession (fig. 3) I must confess shows no signs of it. The head has a mottled appearance, the feathers being tipped with light brown; but in this bird the barred plumage has not attained perfection. Another foreign specimen in my possession, which was said to be a female, although in other respects almost exactly resembling fig. 4, has not the grey head. The tail is also somewhat differently marked, being very similar to that of the bird in the British Museum figured by Mr. Yarrell.

A link is here wanting to show more clearly the change from the barred plumage of the breast and under parts to the pure white. The bird, however, from which

FIGURE 5

was drawn, has some patches of brown on the breast, which appear to indicate the former existence of those bars. The forehead is white;

the space around the eye, and between it and the beak, is dark ash grey. The neck, breast and belly white, slightly tinged and patched with brown; the belly and thighs having also broad streaks of dark brown. The upper part of the wings white, slightly patched with brown; the secondaries and tertials brown, tipped with white. The tail is barred with two shades of dark brown, and tipped with light brown. The bird was shot at Gawdy-hall wood, near Harleston, in Norfolk, and is in the Norwich Museum.

The transition from this to the next specimen figured is very easy.

FIGURE 6.

Though alike in the markings of the head and neck, the breast and under parts of this bird retain no vestige of the brown patches which distinguish that last described. The dark streaks on the same parts are also much narrowed, and the feathers on the upper parts of the wings are now only tipped with white, which is also the case with the secondaries and tertials. The tail resembles that of the last. This bird was killed at Horning, in Norfolk, in 1841; and is also in the Norwich Museum. It is labelled "Adult male."

I have endeavoured, in the above descriptions, to trace the order and connexion of the remarkable changes of plumage to which this species is subject; but at the same time I have considerable doubts as to the entire correctness of the arrangement which I have adopted.

WILLIAM R. FISHER.

Great Yarmouth, August 25, 1843.

Notes on the Nests of Birds. By ROBERT DICK DUNCAN, Esq.

IT gives me much pleasure to know that you intend continuing 'The Zoologist' during the year 1844. A few years ago, although a person were as utterly unacquainted with the realities of Nature as a nun; though he had never stirred above a mile from home; though he could not distinguish a breccia from a true conglomerate, or an insect from a worm; yet if he could repeat a long list of orders, genera and species, he was esteemed a naturalist — a star of the first magnitude. But now the world is changing; and I trust that this change will in no slight degree be hastened by the continuance of your periodical.

Perhaps there is no race of creatures in the whole world which can

boast so much neatness of architecture as birds. The nest of the common chaffinch (*Fringilla cœlebs*) for example, which everybody has seen and more or less admired, is a perfect model of elegance. Like the architects themselves, it possesses this quality without being adorned with any superfluous ornament. Moss, lichens, wool, and a few hairs and feathers, are the only materials of which it is constructed; and the situation in which it is placed, as well as the disposition of the nest there, are admirable. In selecting a place to fix its nest in, the chaffinch usually prefers a branch of the elm, oak or elder-tree, close at its union with the trunk. We have frequently found them, however, in a hawthorn, or on the pendulous bough of a silver fir, and even in apple and pear trees which were trained against a wall. Professor Rennie mentions finding one in a closely clipped privet hedge, and another in a thick row of hollies; but these instances he considers as rather singular.* Perhaps the most singular situation for such a nest is one noticed by Cowper, and quoted by him as the origin of his verses entitled "A Tale," which he tells us is "no fiction." "In a block or pulley near the head of the mast of a gabert, now lying at the Broomielaw, there is a chaffinch's nest and four eggs. The nest was built while the vessel lay at Greenock, and was followed to Glasgow by both birds. Though the block is occasionally lowered for the inspection of the curious, the birds have not forsaken it. The male, however, visits the nest but seldom, while the hen never leaves it, but when she descends to the hulk for food." An instance, by no means so curious as the above, but of no frequent occurrence, fell under my notice in the spring of 1836. While searching amongst a row of willows, which overhang a pretty large stream, in Mid Lothian, for the nest of a water-hen (*Gallinula chloropus*), I stumbled upon that of a chaffinch, fixed on a branch stretching across, and only elevated about five feet from the water. It was composed of the usual materials, excepting that it was entirely destitute of feathers; but their place was comfortably supplied by a superabundant quantity of hair and wool. Why the bird had been attracted to the rivulet I am unable to comprehend, as the neighbourhood is everywhere intersected with its proper retreats.

A still more unusual locality for a nest was once chosen by a ring-dove (*Columba Palumbus*). This bird had fixed its nest in a low furze-bush, growing upon the slope of a considerable clay bank. The twigs with which the nest was formed, were in some places curiously

* Architecture of Birds, p. 264.

interwoven with the branches of the bush. The site chosen by this dove was the more surprising, as the bank lay on the verge of an extensive range of wood, composed for the most part of fir trees.

The situation of the nest of a magpie (*Pica melanoleuca*) found in the west of Linlithgowshire, a knowledge of which was communicated to me by my brother, the Rev. Andrew Duncan, Mid Calder, — is equally striking with the above. It was fixed among the top branches of a hawthorn bush, which fenced by the side of the northern road between Edinburgh and Glasgow. This circumstance is curious, as it shows a boldness not often evinced by the magpie.*

A few years ago I recollect finding the nest of a blackbird thrust into a hole in a wall. The hole had been made by the farmer on whose ground the wall stood, for the purpose of receiving the end of one of the bars of a gate. In a tree immediately behind our house a magpie had for two years built its nest. On the third year we climbed the tree, as usual, to enquire for our chattering friend, when, instead of the " prating thing in black and white," out flew a blackbird (*Turdus Merula*), and on examination it was found that this bird had erected its habitation within the old nest of the magpie. During the same season we found a blackbird's nest fixed in a currant-bush within a few feet of a cottage. And in the following spring a similar nest was discovered in a tree of ivy, which crept along a wall within a few yards of our house, and not beyond the reach of a person's hand while passing up or down the steps which admit to the garden.

In the same locality I have got the lodging of a wren (*Troglodytes vulgaris*). The circumstance that this bird builds many nests which it never intends to use as nurseries, has not been adverted to by many ornithologists. These nests are built by the male bird, perhaps for his own amusement, or for his use during the night, while the cradle-nest is occupied by his patient mate. They are situated at a little distance from the proper domicile, and are not lined like those for rearing the young in, but are simply composed of green moss, or of withered leaves, often of the oak tree, as circumstances direct. One bird builds many of these nests; and he seems to exercise all his wit in pitching upon absurd localities. I remember seeing one of these wrens engaged in building a nest in a wall immediately behind our stable. It was good sport to sit down at a back window and watch his manœuvres. The nest was formed of oak leaves, many of which were far larger than the tiny architect. It was amusing to see

* Macgillivray's ' British Birds,' vol. iii.

him, when, with one of these in his little bill, he fluttered from the plantation to the wall, and a puff of wind met him by the way. Having laid his burden in its place, away he merrily flew to a heap of old sticks; and like a clever little boy, who, having done a clever little thing, claps his hands and laughs at his own prowess, he flapped his wings and sung his song.

A very singular situation for a nest was once chosen by a redbreast (*Sylvia rubecula*) at Kelso, in the year 1835. In a letter which I then received from a friend, Mr. William Darling, jun., he thus writes: — "There is a great curiosity here at present, — a redbreast's nest built on a piece of wood in a wright's shop. The birds never mind the men working, but carry on their arduous task of building. There are plenty of materials near at hand, as most of the nest is composed of soft cuttings of wood." This letter is dated March 27. In this case, then, both the locality and materials of the nest, and the time of the year, are somewhat singular.

I have often heard of the parasitic disposition of the house-sparrow (*Fringilla domestica*), but never have I personally ascertained the fact. Avicenna, Albertus Magnus, Batgowski, and Linnæus, tell us of a contest between a window-swallow and a house-sparrow. The latter having taken possession of the nest of the former, a determined battle ensued between the proprietor and the invader, in which the sparrow came off in the first instance victorious, from its cunningly remaining in the nest. The swallow, however, was fully revenged; for summoning its companions to assist, they brought a quantity of nest-mortar, and entombed the sparrow alive. Dr. Paxton, in his Poems, relates a similar occurrence which took place while he was present; and Mr. Weir, in Professor Macgillivray's 'British Birds,' tells us of a third. I am happy to add a fourth testimony. An eye-witness, Mr. John Neil, jun., informs me that at Selkirk, I think in the year 1837, he and twenty other individuals saw two martins entomb in their nest a sparrow which had taken possession of it. Afterwards they took down the nest to let out the prisoner, but the felon was dead.

A pair of tomtits (*Parus cæruleus*) have tried for many years to fix their nest in the shaft of a pump-well in this neighbourhood.

A few years ago Mr. Archibald Walker, Colinton, discovered in Calder wood, the solitary nest of a bird which generally nestles in colonies. While wandering in a certain part of the wood, known by the name of the "Dark walk," he saw situated on a lofty and almost inaccessible branch of a tree, a nest resembling that of the carrion crow, or of the owl. On making his way up to it, to his surprise he

found it to be that of a heron (*Ardea cinerea*). It contained a few beautiful blue eggs. ROBERT DICK DUNCAN.

Vale of Almond, Mid Calder, Edinburghshire,
October 19, 1843.

Note on the Habits of the Barn Owl. Some time ago I had a very favourable opportunity of observing the habits of the barn owl during the breeding season. For four years in succession a pair of these birds resorted, during the breeding season, to a hollow tree, not more than thirty yards from my house. During the time of incubation one of the old birds generally reposed during the day on a beam in the church porch, which was almost adjoining, and when disturbed flew to a short distance. Whenever I saw it, it was sitting perfectly upright. Soon after the young were hatched, two distinct sounds might be heard from the nest during great part of the day; the one exactly resembling the deep breathing of a person in a sound sleep, the other that of a person loudly snoring: both sounds ceased as soon as the inhabitants became aware that any one was near. As the young birds increased in growth, one or more might frequently be seen towards the afternoon at the entrance of the cavity; they were always silent, but the same sounds were still audible from the nest. On approaching them at this time, their look of extreme surprise, and the awkward solemnity with which they withdrew from observation, was ludicrous. Soon after five in the evening the old birds commenced their search for food for their family, which appeared to consist chiefly of mice. I have watched them often sailing slowing over the fields and along the hedge-rows. Upon seeing a mouse, they dropped upon it in an instant, and having secured it, returned immediately to the nest, passing frequently within a few yards of me. I noticed that one or other of the parent birds returned with food to the nest at intervals of from five to seven or eight minutes, during the whole evening. The prey was always carried in the foot, which was allowed to hang down, giving an odd appearance to the bird while on wing, but as soon as it reached the tree it was transferred to the beak. I once saw the transfer made while the bird was flying. The general number of young brought up during the time I observed them was four. When once they left the nest I saw no more of them; the old birds remained, but the young ones seemed to leave the immediate neighbourhood. I never knew them produce a second brood in the year. — *John Athinson; Layer Marney Rectory, Kelvedon, Essex, October* 21, 1843.

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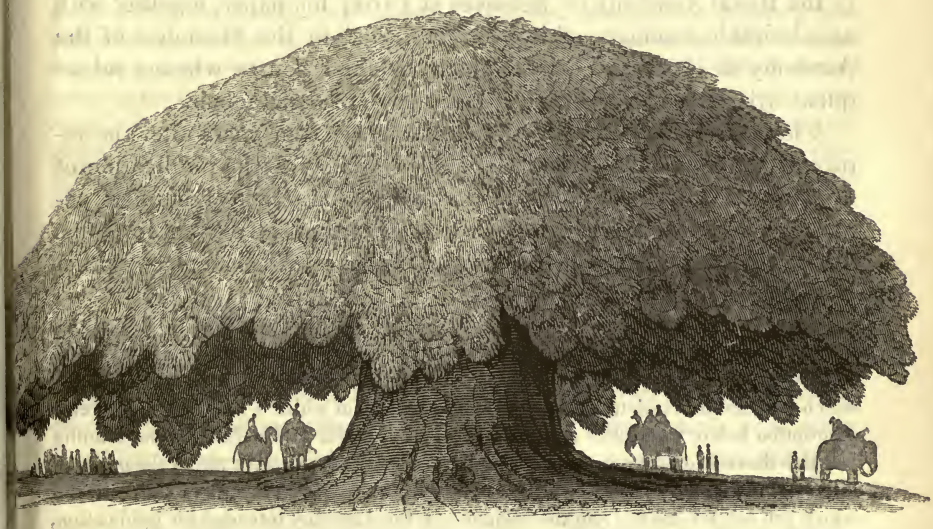
Art. CVII. — *Notes on the Baobab Tree, (Adansonia digitata).*

By George Luxford, A.L.S., &c.



THE BAOBAB.

Egyptian Sour Gourd. Monkey's Bread.

Baobab, Bauhin, Hist. i. 110.
Adansonia Baobab, Linn. Sp. Plant. 960.
Adansonia digitata, Linn. Syst. Veg. 620.

Group.—Syncarposæ. Alliance.—Malvales.
Natural Order.—Sterculiaceæ. Section.—Bombaceæ.
Linnæan Class and Order.—Monadelphia Polyandria.

Having received from a correspondent a copy of the 'Bombay Monthly Times for June, 1842,' which contains some interesting particulars relating to the Baobab-tree of Senegal, as observed in India,

it has occurred to me that a few notes on this "colossus of the vegetable kingdom," even if they contain nothing new, may not be out of place in the pages of 'The Phytologist.'

The Baobab is a native of Senegal and other parts of the western coast of Africa, from the Niger to Benin, "a part of the world," says Adanson, "which has always been justly looked upon as the mother of monsters." This celebrated French naturalist resided in Senegal for about five years, and was probably the first botanist who had the advantage of studying the Baobab in its native country. In 1756 M. Adanson communicated a very full account of this remarkable tree to the Royal Academy of Sciences at Paris; his paper, together with an admirable summary of it, were published in the Memoires of the Academy in 1761, and appear to be the chief source whence subsequent writers have derived their knowledge of the Baobab.

A letter from Adanson to Linnæus, written four years after the return of the former from Senegal, and previously to the publication of the memoir mentioned above, contains the characters of his new genus, and several remarks upon it; the following is an extract from this letter, which is printed in the 'Correspondence of Linnæus and other Naturalists,' ii. 467.

"Paris, Oct. 2, 1758.

"Among numerous new observations in natural history which I have formerly communicated to the *Académie des Sciences*, is a complete description of the *Bahobab*, which Bernard de Jussieu has named *Adansonia*, and of which I had long ago given a description before your letter reached me. B. de Jussieu had refrained from sending you this description during my absence, that he might not deprive me of the opportunity of giving you pleasure. I therefore now send the essential parts of the character which you ask for, taken from the Memoirs of the Academy intended for publication, or rather from my own Latin manuscripts, according to the plan of your *Genera Plantarum*, as I mean to give them to the public.

"Adansonia.

"*Calyx.* Perianth simple, of one leaf, cup-shaped, divided half way down into five revolute segments, deciduous. [Fig. *c*].

"*Corolla.* Petals five,* nearly orbicular, ribbed, revolute, united by their claws to the stamens and to each other. [Fig. *b*].

"*Stamina.* Filaments numerous (about 700), united in their lower part into a conical tube, which they crown at the top, spreading horizontally.—[Fig. *d*.] Anthers kidney-shaped, incumbent.

"*Pistil.* Ovary nearly ovate. Style very long, tubular, variously twisted. Stigmas from 10 to 14, prismatic, shaggy, spreading from the centre.

* In Adanson's figure of the flower, of which fig. *b* at p. 436 is a fac-simile, four petals only are shown; in his separate figure of the corolla there are five petals, which is the normal number.

" *Pericarp.* Capsule oval, very large, woody, not bursting, internally separated into from 10 to 14 cells, filled with dry pulp and with seeds; the partitions membranous and longitudinal. [Page 437.]

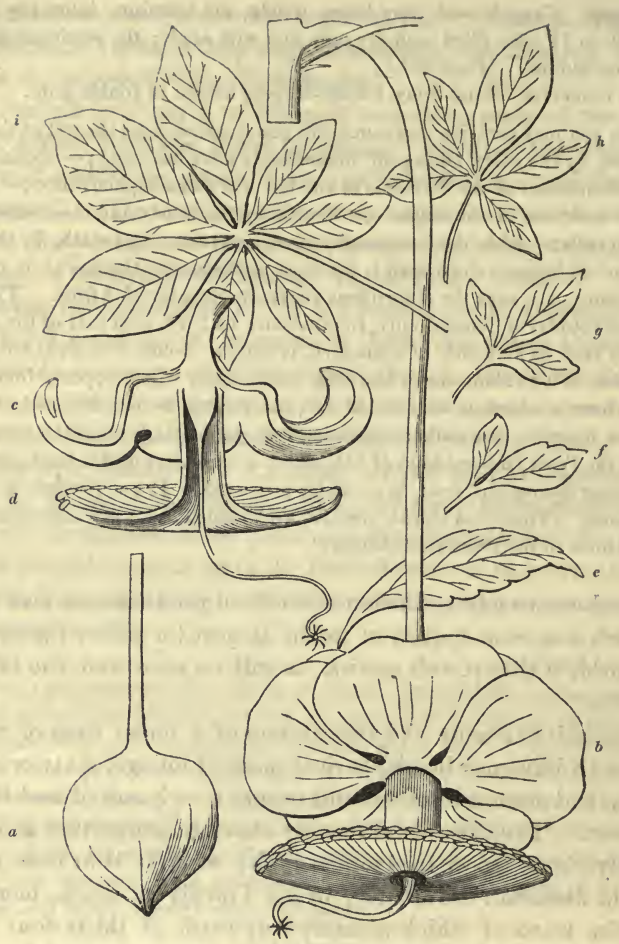
" *Seeds* numerous, almost bony, kidney-shaped, lodged in friable pulp.

" Hence you may perceive how much this genus differs from the rest of the mallow tribe. First, by the calyx falling off immediately after flowering; — second, by the number and situation of the filaments at the top of a monadelphous tube; — third, by the number and form of the stigmas; — fourth, by the woody and close capsule, with its pulp and cells; — fifth, the compound fingered leaves; — and sixth, by the tree itself, which of all hitherto discovered is the most prodigious in the size of its trunk and branches, being as it were the stupendous vegetable monster of Africa. This tree is found in the country of Senegal only, from whence its fruit, with that of the *Agilhaid*, is sent every year, as an article of commerce, to Egypt. Some of its seeds having been planted there, in a garden, one or two trees were raised, which appear, from Prosper Alpinus, to have attained no remarkable size, nor perhaps to have flowered, if we may judge by the figure in that author, which in every particular, except the fruit, is erroneous. In the West Indian island of Martinico, a single tree of this kind, already full grown, bearing flowers and fruit, is carefully preserved. It was formerly sown there by the negroes. These and similar remarks are detailed, with my authorities, in the communications to the Parisian Academy."

In the above extracts allusion is made to the immense size of this tree, which has been spoken of as the largest (or rather the broadest) in the world, a title it well merits, as will be seen from the following description.*

The Baobab has more the appearance of a forest than of a single tree. It is an immense hemispherical mass of foliage, sixty or seventy feet high, and from a hundred and twenty to a hundred and fifty feet in diameter. The main trunk is very short in proportion to its size, being only about ten or twelve feet high; while it is at least twenty-five feet in diameter. Golberry, in his Travels in Africa, mentions a Baobab the trunk of which measured upwards of thirty-four feet in diameter, and was about thirty feet high. The branches are of considerable size, and fifty or sixty feet long; the central branch rises perpendicularly, the others spread around it in all directions, the low-

* The Norfolk-Island Pine (called *kauri* by the New Zealanders) occasionally grows to a large size. Mr. Terry, in his lately-published work on New Zealand, mentions an extraordinary individual which grows on the eastern coast, near Mercury Bay, which is the largest in New Zealand. " It is called by the natives the Father of the Kauri. Although almost incredible, it measures seventy-five feet in circumference at its base. The height is unknown, for the surrounding forest is so thick, it is impossible to ascertain it accurately. There is an arm some distance up the tree, which measures six feet in diameter at its junction with the parent trunk." It is evident that the particular tree here spoken of, far exceeds the average size of the species.

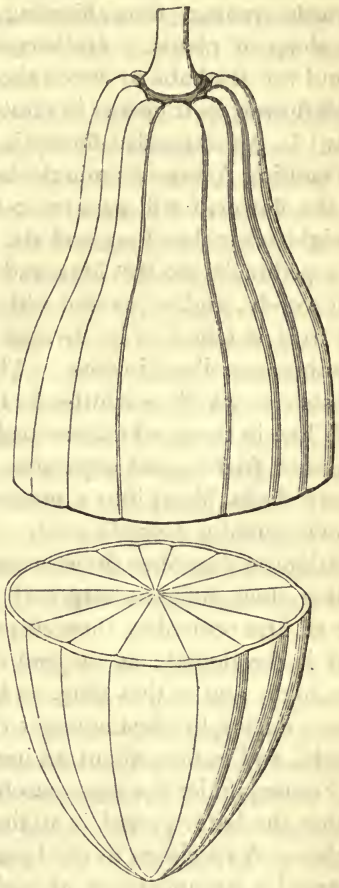


Flowers and leaves of the Baobab.

a. Flower-bud before expansion. *b*. Expanded flower. *c*. Section of the calyx. *d*. Section of the stamens. *e*, *f*, *g*, *h*, *i*, Leaves from trees of different ages.

er ones being nearly horizontal for the greater part of their length, while the extremities frequently trail on the ground, from their own weight. The roots are much longer than the branches. The central root descends perpendicularly to a great depth; the lateral ones extend horizontally, and are sometimes but a short distance below the surface of the ground. Adanson saw one of these roots, of which a great portion had been laid bare by the waters of a river; the uncovered part measured about one hundred and ten feet, and judging from its size he considered that forty or fifty feet might be still hidden.

The bark of the trunk and older branches is about nine lines thick, of an ash-grey colour, smooth to the touch, and having a shining appearance, as if varnished; that on the younger branches is greenish and somewhat hairy. The wood is soft, white, and extremely light, being very little heavier than cork. In the Bombay Monthly Times are given the results of carbonizing seven different sorts of wood, including that of the Adansonia. The weight per cent. of charcoal yielded by each is as follows.—Adansonia, 33; lignum vitæ, 26·4; mahogany, 25; oak, 22; beech, 19; ash, 17; Scotch fir, 16: so that the lightest wood presents the anomaly of yielding 6·6 per cent. of charcoal more than the heaviest.



Fruit of the Baobab.
The lower section shows the arrangement of the carpels.

The leaves are very similar in general appearance to those of the horse-chesnut, being somewhat orbicular in outline, and divided into several elliptical lobes, which are entire at the margin, and vary in number from three to seven. They are alternate, and supported by a petiole, at the base of which are two small stipules; these are said by Adanson to fall off as soon as the leaves expand; they are, however, represented in his figure. The leaves of very young trees are undivided and nearly sessile; the digitated leaves first make their appearance when the young plant is about a foot high. The figures *e*—*i*, on the opposite page represent the different forms of the leaves; the lobes of the fully developed leaves (*i*) are from four to six inches long and two or three inches wide.

The flowers of the Baobab, as might be expected from the size of the tree, are very large. The flower-bud (fig. *a*) is globose, and nearly three inches in diameter; when fully expanded the flowers are usually about six inches in diameter. There are generally two or

three of these flowers on a branch, each being suspended by a peduncle which springs from the axil of one of the lower leaves, and bears a few scattered deciduous scales or bracts. The peduncle is a foot long and four lines thick. The handsome white flowers, like those of many allied plants, expand in the morning, about sun-rise, and close towards evening, thus affording an example of what Linnæus terms the sleep of plants. Golberry observes that the negroes assemble round the Baobabs to watch the expansion of their flowers; and that each flower, as it opens, is saluted with — "Good morning, beautiful lady!" An expanded flower is shown at *b*.

Omitting Adanson's minute description of the calyx and other parts of the flower, I will pass on to the fruit (p. 437), which is fromtwelve to eighteen inches long and six inches in diameter, and is suspended by a peduncle two feet long and nearly an inch thick. It is very hard and woody, and is covered with a greenish down. When cut across the fruit is found to be divided into from ten to fourteen cells by membranous dissepiments. The seeds are embedded in a spongy substance, which is whitish in fresh and healthy fruits, and of a reddish hue in those which are badly formed or very old; as it dries it becomes friable, and separates, either spontaneously or on receiving a very slight blow, into a number of irregular polyhedrons, each of which contains a single seed.

Adanson describes the structure of the seed and its mode of germination, four different stages of which are figured. The cotyledons are at first orbicular, then elliptical; on the fourth day the first true leaf is developed; at the end of a month the young tree is about a foot high, and at that time, as before stated, the digitated leaves appear; during the first summer the tree increases to about five feet in height, and is then about an inch or an inch and a half thick, whilst in France, under the most careful treatment, the author observes that within the latter period it attains no greater height than about twelve inches. A specimen in the botanic garden at Calcutta is said to have attained a circumference of eighteen feet in twenty-six years.

The Baobab comes into leaf in June, flowers in July, matures its fruit in October and November, and in the latter month it loses its leaves. It is very common both in the Island of Senegal and at the Cape de Verd, and along the sea-coast to Sierra Leone, and is even met with at Galam, which is more than a hundred leagues from the sea. M. Golberry says that in the year 1786 he "saw the greatest number of Baobabs on the isthmus of the peninsula of Cape de Verd, between the bay of Jof and that of Dakar," a space of nearly two

square leagues, where there were at least sixty trees. The roots penetrate rocky soils with great difficulty, and if ever so slightly injured they decay; this decay is soon communicated to the trunk, where its progress is very rapid and the tree quickly perishes. Hence it thrives best and is most abundant in wet shifting sands, such as those which extend from Senegal to Cape de Verd, a distance of thirty leagues; while at Galam, where the soil is a hard stony clay, it occurs much less frequently and is comparatively small.

Besides a general rottenness or decay arising from injuries received by the root, this tree is occasionally subject to another disease, most probably produced by a fungus somewhat similar to that causing the dry rot, which spreads through the woody portion, and reduces it to the consistence of the pith, without either altering the colour of the wood or changing the disposition of its fibres. The bark also remains uninjured, and there is nothing in the external appearance to indicate the operations of the insidious enemy within. When thus affected the tree is frequently unable to resist the force of the wind; Adanson met with one in an island near Senegal, the trunk of which had been broken asunder in the middle during a gale. The trunk, at the time he saw it, was inhabited by an immense number of very large Coleopterous larvæ. The disease by which the tree was destroyed had most probably made considerable progress before the insects deposited their eggs in the trunk; at all events we know this to be the case with willows and other trees, which are seldom if ever attacked when in a sound and healthy state.

The rapid decay of a fine specimen of this tree, which grew at Colabah in Bombay, is doubtless to be attributed to the same disease.—This tree—one of the finest in western India—was forty-four feet in circumference. In May 1840, it was vigorous and apparently healthy; a few months after that time the large branches began to fall off and the ravages of disease proceeded with great rapidity. On examination the decayed portions were found to be perforated in all directions, like the one seen by Adanson, by the larvæ of a beetle, which were reducing the whole to a powder resembling saw-dust. Both the larva and the perfect insect are figured in the Bombay Times. The former is described as being two and a quarter inches long, and three inches in circumference at the thickest part. Some idea of the ravages of these larvæ may be formed from the statement, that a piece of the tree three feet long and eight inches in girth, apparently healthy and sound, was found to be so thoroughly perforated that scarcely two inches of solid wood could be found entire.

We have heard such astounding statements respecting the longevity of this tree, that it would not be right to pass over the subject quite without notice. In the Bombay Monthly Times before referred to, are some interesting notes furnished by the Rev. Dr. Wilson, who remarks that —

"This tree seems to be associated with absurdity among the sages of the West as well as the East. 'The Baobal-tree of Senegal,' says Lyell in his 'Principles of Geology,' 'is supposed to exceed almost any other in longevity; Adanson inferred that one which he measured, and found to be thirty feet in diameter, had attained the age of 5150 years. Having made an incision to a certain depth, he first counted three hundred rings of annual growth, and observed what thickness the tree had gained in that period. The average rate of growth of younger trees, of the same species, was then ascertained, and the calculation made according to a supposed mean rate of increase.' Now, how does the matter stand, with regard to the specimens we have before us in India? Dr. Roxburgh tells us that the tree is an *exotic* in this country — and he is quite correct. It was introduced by the Portuguese from Mozambique within the last three hundred years; and in many instances it has already attained to a growth *exceeding* that specified by Adanson and Lyell. Dr. Lindley has shown that what are called the annular [? annual] rings, are not to be depended upon in calculations as to the age of trees; and that with reference to this very extraordinary species."—Extracts from Notes of a visit to Dwaraka, by the Rev. Dr. Wilson.

There is no doubt that the Baobab lives to a very great age, as may be inferred from its enormous bulk. Adanson's observations on some trees which he met with in one of the Magdalen islands, led him to the conclusion that they were growing there at the time of the deluge, consequently that they were, at the time he saw them, upwards of five thousand years old! On these trees were carved some European names, some of which were distinctly dated in the fifteenth and sixteenth centuries, others less distinctly bore date in the fourteenth. Adanson thought it probable that the same trees were seen by Thevet when he passed these islands in 1555, on his voyage to the antarctic regions. The letters of the names were six inches high, and the names themselves occupied a length of about two feet, or somewhat less than the eighth part of the circumference of the trunk. Reasoning from these facts, and from his own observations of the rate of growth of the tree, Adanson arrived at the conclusion above stated, which is most probably an erroneous one. The same trees were seen by Golberry, thirty-six years after Adanson was on the island; he says that the words of the inscription were Dutch, and that one of the dates was 1449.

When I first read Adanson's account of the Magdalen-island Baobabs, I could not help suspecting that their size was incorrectly given, a circumference of sixteen or eighteen feet appearing to bear no pro-

portion to the enormous age assigned to them. But on turning to the narrative of his voyage, prefixed to the 'Natural History of Senegal,' p. 66, I find that the diameter of the trees is expressly stated to be six feet. The author says that the names were deeply engraved in the bark, and that each person of the party, except himself, added his mark to those previously on the trees, but that he was satisfied with renewing two of the names which were old enough to be worth the trouble, one of them being dated in the fifteenth the other in the sixteenth century. Then follow the size of the letters, and a brief summary of the same arguments relating to the age of the trees which are afterwards given in detail in the Memoir published by the Academy. But be it observed, that neither in the Narrative nor in the Memoir does Adanson say one word about his having made an incision in the trunk and counted the number of annular layers of wood, in order to determine the age of the tree; his arguments are founded solely on the observed annual rate of increase of young trees in height and diameter, and his data are given by Sir W. J. Hooker, in the 'Botanical Magazine,' 2791-92, where the flower, fruit and leaf are beautifully figured.

The following remarks by a correspondent of the Bombay Monthly Times bear directly on the questions of the age of the tree and of its native country.

"I find you make no mention of the Adansonia digitata obtaining great perfection in the ruins of Mandoo and its environs, of which I remember once to have descanted in our evening conversations; indeed I believe these are the only localities in the upper parts of India, where the 'Khorassan Eemlee' as it is there called, is to be found in great numbers and of enormous girth.

"From Nalcha to the Delhi gate of Mandoo, a distance of six miles along the Vindyah, the road on either side is lined with the ruins of palaces, mosques and tombs, mingled with innumerable groups of the Adansonia digitata, the same extending in a long avenue from thence to the Jumna Musjid in the centre of the city, from whence they diverge to the royal parks and gardens.

"The Mahometans fondly treasure this tree as a relic of Moslem sovereignty, believing it to have been brought by the northern conquerors to embellish their imperial residences in the east; and moreover, that it languishes and dies in any Indian soil but that favoured as the abode of royalty. Sooner therefore would they lose an arm than a branch from this boasted tree, although its insidious inroads have done more to complete the ruin of Mandoo, than either the hand of time or Rajpoot bigotry; rooting itself in every crevice of the walls and roofs, and uptearing with its giant arms enormous masses of masonry. * * That the tree appears to be one to which the natives of India seem to attach much importance, is evident from both Hindoos and Mussulmen considering it in a sacred character: this probably proceeds from its prodigious size and comparative scarceness, as it is evident the Mahomedans have no claim to its importation from Khorassan, as I am credibly informed by travellers from thence there is scarcely a tree in that region attains a tithe of its size."

Adanson considers the Baobab to be indigenous nowhere but in those places on the western side of Africa which have been mentioned above; and states that the negroes, wherever they go, are in the habit of carrying with them the seeds of such plants as they make use of in cooking, or for other purposes. He enumerates many of these plants, among which are the Baobab, two kinds of cotton, the tamarind, several sorts of beans, the water-melon, &c., and observes that all these are now found in America, where they have every appearance of being indigenous, although many of them have not received American names. In support of his opinion that the Baobab is a native neither of the American continent nor of any of the West-India islands, he cites the works of Plumier, Sloane and Browne, in which it is not mentioned. He also observes that M. Thiebault de Chanvalon, an inhabitant of Martinique, speaks of a single tree growing on the island, as being the only one he had ever seen in that region. This was a young tree at the time Adanson received his information from M. Thiebault, although it had then, for some years, borne flowers and fruit. Dr. Roxburgh does not consider it to be indigenous in India, where he says it is scarce and of small size, observing that a few only have been found of any size at Allahabad, Masulipatam, on the coast of Coromandel, and in Ceylon. After reading Adanson's remarks on the custom of the negroes in transporting the seeds of the Baobab, it is not difficult to account for its introduction into Asia, and other parts of the world where it is now met with.

As a genus Adansonia seems to be chiefly distinguished from Bombax (whose habit it has, and to which Linnæus and Cavanilles say it is too nearly allied) by its deciduous calyx, its numerous stamina and its smooth shining seeds, those of Bombax being downy or woolly.—Among other and more obvious marks of agreement with other genera of the alliance Malvales, such as the extreme lightness of its wood, the large and handsome flowers, &c., may be mentioned that of the pollen grains being round and covered with minute points, as in our common Mallows. From the position of the Baobab in the system, we should expect to find its properties similar to those of its natural allies the Malvaceæ; and the various uses made by the negroes of the different parts of the tree confirm this expectation. The mucilaginous emollient quality common to the tribe, resides principally in the bark and leaves; these are dried in the shade, in a free current of air, then reduced to a powder of a beautiful green colour and nearly tasteless; this powder is kept in a dry place in calico bags, and is called *lalo*. The negroes make daily use of the *lalo* in their food, for the purpose of

keeping up an abundant perspiration and cooling the blood. Adanson and one of the French officers who accompanied him, made use of the *lalo* rather freely, and to it he attributes their preservation from the ardent fevers so prevalent in Senegal during September and October. The author particularly mentions the year 1751, the autumn of which year was more than usually unhealthy in Senegal, and states that himself and his friend were the only persons of the party who were able to follow their usual avocations, all the other officers being confined to their beds. The fruit of the Baobab appears to be as useful as the leaves; in a recent state its flesh is slightly acid and of an agreeable flavour, and its juice, mixed with sugar and water, forms a refreshing beverage in putrid and pestilential fevers. The fleshy envelope of the seeds, when dry, is reduced to an impalpable powder; P. Alpinus says it was sold in his time as a medicine, under the improper name of *terra sigillata*, or Lemnian earth. Monkeys are said to feed on the seeds; these are about the size of a bean, shining, and of a brownish colour, and are made into necklaces by the negroes. The shell of the fruit, and even the fruit itself when spoiled for eating, is burned, and the ley obtained from the ashes, boiled with rancid palm oil, forms an excellent soap.

Our author concludes his account of the various uses made of the Baobab, with the following singular narrative. It has been previously stated that the roots of such trees as grow in stony ground are liable to injury, and that in consequence their trunks decay and become hollow. The negroes take advantage of the cavities thus formed, and shape them regularly into chambers, or rather vast caverns, wherein they deposit the bodies of those whom they deem unworthy to receive the ordinary rites of burial. Of this class are persons called *guiriots;* these are the poets, musicians and players, of both sexes, who are hired to preside over and assist at dances and other entertainments, to which they impart much life and spirit by their buffooneries. The negroes regard these people, while living, with a kind of superstitious awe and reverence, but no sooner are they dead, than such feelings give place to horror and contempt; the natives then neither allow their bodies to be buried in the earth nor cast into the waters, imagining that if thus disposed of, the fish in the latter would be destroyed, and that the former would produce no food. By way of averting these evils the bodies of the guiriots are suspended within the hollow trunks of the Baobab, the entrances to which are closed with planks, and there, without being embalmed, they quickly dry up and become converted into a kind of mummy.

But it appears that the Baobab is not exclusively appropriated as a receptacle of the dead; the one measured by Golberry was hollow, and used as their hall of assembly by the inhabitants of the valley of Dock-Gagnack. The entrance was seventeen feet high, and faced a lake; the height of the cavity itself was twenty feet and its diameter twenty-one. The negroes had ornamented the sides of the doorway and the interior of the cavern with rude sculptures in relief. The party pitched their tents by the side of this tree, and M. Golberry was so well pleased with the chamber, that he ordered his bed to be placed within it, intending to pass the night there. This however caused so much dissatisfaction among the natives, that he abandoned his intention, although the chiefs would not have prevented him from carrying it into effect. He states that he had no occasion to repent his forbearance, having been afterwards treated with the greatest kindness by the natives.

In Dr. Wilson's notes above alluded to, it is mentioned that he visited one of these trees in India, which the Bairagees whom he found sitting in its shade told him was the only one in the world, and requested him to take off his shoes as he approached it, an honour which himself and party declined paying. He was informed that several devotees nightly took up their quarters in the hollow trunk of this tree.

It is also stated that in South America the natives hollow out the trunk of the Baobab and use it as a habitation, and that the tree thus hollowed continues to grow and flourish so long as the sap-wood and bark remain. The wild bees of Abyssinia are also reported to deposit their honey in this tree; and that the honey stored therein is the best in the country.

Dr. Alex. Gibson, in the Bombay 'Medical and Physical Transactions,' states that at Goozerat, where grow many fine specimens of the Baobab, the fishermen use the fruit as a float for their nets, and that logs of the very light wood are also employed by them as a catamaran or raft in fishing or duck-catching.

Adanson observes that in Senegal the Baobab has almost as many names as there are kingdoms. The Oualofes call the tree *Goui* and its fruit *Boui;* the French call the tree *calabassier*, and the fruit *monkeys' bread*, (*pain de singe*). Prosper Alpinus, the first botanist who wrote of this tree, says that a fruit called *Baobab* was brought from Ethiopia to Grand Cairo; from his description, and from the notes of his commentator, Wesling, there is no doubt of this fruit being that of our tree, although, as Adanson observes, the fruits seen by Alpinus

must have been small and in a bad state, being probably such as are used at Senegal for no other purpose than making soap. The author considers the figure given by Alpinus to have been drawn from imagination, but remarks that Clusius contented himself with representing only what he saw. Clusius says that he received the fruit under the names of *abavo* and *abavi*, from persons who had it from English sailors returning from Ethiopia, or rather from the coast of Guinea or Senegal: he also says that the Portuguese call the fruit *calebacera*. Scaliger gives a very short description of the fruit, brought from Mozambique under the name of *guanabimus*. After stating that all the above-named authors are cited in Bauhin's Pinax, Adanson observes that M. Lippi's manuscript remarks ought not to be passed over in silence. This learned traveller, who was the victim of a voyage into Abyssinia, undertaken by order of Louis XIV. during a period of tumult and revolution in that country, gives a much more accurate description of the fruit of the Baobab, which he saw at Cairo, whither it had been brought from Upper Egypt, than any author who had preceded him. After a warm eulogium on M. Lippi, Adanson concludes his admirable memoir by stating that it is evident, from the passages quoted, that the authors cited were acquainted only with the fruit and leaves of the Baobab, but that they had no knowledge of its flowers or of the tree which bore them, the monstrous size of which presents a fact the most remarkable which the history of Botany and perhaps that of the world can furnish.

Geo. Luxford.

65, Ratcliff Highway,
December 17, 1842.

Art. CVIII.—*Note on the Sands of Barry, and on Equisetum variegatum.* By Mr. J. B. Brichan.

I had lately an opportunity of examining the locality named above, and as Equisetum variegatum there assumes a somewhat different appearance from that which it presents on Deeside, the few remarks I have to offer will form an appropriate sequel to my paper on the three allied Equiseta, (Phytol. 369). Whether or not the spot in which I found the plant is the same in which it was found by Don, I am unable to say; having no guide and no information, I rather stumbled upon it than searched it out, and though I went over a considerable

space, I detected it only in one spot. As the locality is in various respects interesting, I may be pardoned for occupying a few sentences in particularly describing it.

A considerable part of the parish of Barry, containing from six to ten square miles, is a low sandy flat, which, at some remote period, undoubtedly lay under the sea, and is still very little elevated above its level. The links and sands, which compose the southern portion of this flat, are diversified by numerous sand-hills and knolls, which increase in size towards the south-east, and there terminate in a large sandy ridge, probably about 100 feet above the level of the sea. The smaller ones are covered with grasses, mosses, Carices &c., especially with Ammophila arenaria (*Scotticé* bent), which covers also the larger hills and part of the higher ridge already mentioned. Towards that ridge the sand-hills are rather crowded, but to the westward they decrease both in size and in number, rising however in some cases to a height of 20 or 30 feet. Of these the highest and most conspicuous hill, or group, lies close to the sea, about one mile west of *the light-houses*, and immediately south of a large plain or meadow, where a few tall poles mark the locality of an old race-course. It is on all sides clothed with Ammophila, but is hollow and broken in the middle. A cart-road runs through the hollow, in the middle of which, and on each side of the road grows Equisetum variegatum. The spot is, on an average, not more than ten feet above the sea.

The whole district of which Barry forms a part, rests upon the Old Red Sandstone, which, according to Mr. Miller's intensely interesting work bearing the same name, derives its prevailing colour from an admixture of iron. I know not whether it is to be attributed to the same cause that much of the sand of the district is tinged with red; but in the work just alluded to I find the following. — "The oxide deposited by the chalybeate springs which pass through the lower members of the formation, would give to white sand a tinge exactly resembling the tint borne by this upper member." And it is certain that when a cut of several feet is made in almost any part of the plain of Barry, the chalybeate water immediately appears, and that its peculiar scum is seen floating along the edges of a small stream which bounds the parish on the west, and into which various chalybeate springs discharge their waters. The general appearance of the *surface* where E. variegatum grows is perhaps against the supposition that the sand has any mixture of iron; but when the sand is dug, it is found to be of a dingy brown, and the lowest stratum of the sand-hills is streaked with sand of a still deeper hue. These facts appear to confirm the

remarks I lately offered on the three allied species or varieties, — E. hyemale, Mackaii and variegatum; there is, however, this difference between the two localities that I have examined, that the prevailing rocks on Deeside are granite, and, if I mistake not, granitic gneiss. The situation of E. variegatum at Barry seems to overthrow my conjecture that "the banks and bed of rivers" are its natural habitat: there is scarcely an imaginable way in which a stream could have deposited it in the spot which it now occupies.

The *roots* of the Barry plant scarcely differ from those of the Deeside variety. The *stems* are of the same variable length and number of articulations, with 4 — 10 striæ: they are completely prostrate, except in a few instances, when supported by Ammophila arenaria. When not sheltered by that or any other plant, they are brownish on the upper or exposed side and green on the under; it is, however, possible that the brown colour may be the effect of the lateness of the season. On the upper side also the bands of black upon the sheaths run farther down the stem than they do on the under side. The *teeth* are wedge-shaped, not ovate as at Banchory: the bristles are longer and apparently more persistent. The *catkins* are in general more exserted and matured, and, as well as the stems, have sometimes a reddish tinge. The plant seems to *branch* in the same manner as in the higher and moist situation on Deeside, 150 feet above the sea. When the sand is compacted by small plants which afford no shelter to the Equisetum, the latter is generally very small, slender and filiform; where the sand is loose or the plant has shelter, its growth is much stronger, and in the sheltered situation it is greener. In no case does the plant attain the same size as on Deeside. Some specimens slightly resemble E. Mackaii, but are perfectly distinct; the resemblance arises from the bristles being longer, and the amount of black upon the sheaths greater than in the usual state of the plant.

The links and sands of Barry form a very interesting botanical station. I have no doubt that a summer ramble among these hills and hollows would amply repay the researches of the botanical visitor; for although my visit took place at the end of October and the beginning of November, when they were in a state of decay, I could detect, among others, the following plants: — Astragalus hypoglottis, Elymus arenarius, Juncus balticus, and, I think, Erigeron acris. Juncus balticus is especially plentiful, being found in almost every part of the extensive links, and forming large plats in the meadows and hollows between the sand-hills. In this and similar places the intelligent observer cannot fail to be struck with the peculiar adaptation of the

prevailing vegetable productions to the character of the soil in which they grow. To my mind it furnishes a striking instance, not only of the "Wisdom of God in Creation," but of the wisdom of God in *providence* also. In a district of almost pure sand, while the more inland and level part is covered with common vegetation and vegetable mould, the seaward portion has been gradually overgrown with Ammophila arenaria, Carex arenaria, Elymus arenarius, and several other plants, all so well fitted by their creeping roots to bind the sand and prevent it from shifting. Even Equisetum variegatum, though confined to a small space, has its creeping root, and is calculated to serve the same end. And thus, in the first instance, an arid waste of sand, either upheaved from the bottom of the sea or exposed by the gradual retiring of its waters, and in that state utterly destitute of vegetation, has, by the agency of a powerful wind, been partly accumulated into a natural bulwark against the return of the ocean; and then, while its plains have by degrees been covered with a mould which has converted them into land capable of cultivation, its still sandy heaps which compose that bulwark have become consolidated, even to the verge of the sea, by a dense covering of plants, the most prominent and important of which are found only in such localities. J. B. Brichan.

Manse of Banchory, December 1, 1842.

Art. CIX.—*County Lists of the British Ferns and their Allies.* Compiled by Edward Newman.

I do not wish to conceal the fact that the perusal of Mr. Watson's admirable paper on the 'Geographical distribution of British Ferns,' has been the means of inducing me to attempt a still more rigid investigation of the produce of our counties, so far as regards this beautiful family of plants. In prosecuting this design, I find myself at the very threshold compelled to abandon my original intention of restricting each county list to the observations of an individual botanist: the kind and prompt attention with which my wish, expressed in 'The Phytologist,' has been met, enables me to make these lists far more interesting, by combining under each county the observations of many botanists. In employing the nomenclature formerly proposed by myself, and subsequently adopted in the valuable Catalogue published by the Botanical Society of Edinburgh, I conform to the usage of the majority of my correspondents. The authorities are arranged as

nearly as possible in accordance with the dates of the letters containing the information quoted.

It appears, from carefully collating all the authorities within my reach, that the recorded species of British ferns are forty-six in number: of these one is now considered a doubtful native; twelve (printed in *italics*) are ranked by some authors as varieties; and thirty-three (printed in Roman letters) are acknowledged by every writer. By adhering to these numbers the relative proportions of each county will remain uninfluenced by the different views of botanists on this most interesting but debatable point. Species whose present existence in the county has not been verified by any of my correspondents, are marked with a dagger. †

YORKSHIRE.

Lomaria Spicant. Abundant in the neighbourhood of Sheffield; a rigid jagged variety is sometimes found, *J. Hardy:* common everywhere, *S. Gibson:* heaths, shady banks &c. abundant, *R. Spruce:* Langwith, near York, *S. Thompson.*

Pteris Aquilina. Most abundant in the neighbourhood of Sheffield, and one or two marked varieties occur, *J. Hardy:* common, *S. Gibson:* heaths, shady lanes and woods, frequent, *R. Spruce:* near York, *S. Thompson.*

Allosorus crispus. Fountain's fell, *S. Gibson:* (J. Tatham), *H. C. Watson*, *S. Thompson:* Cronkley-scar &c.; Teesdale; sides of Ingleborough hill; Settle, frequent; on Penhill, near the slate quarry;—*Baines's Yorkshire Flora.*

Polypodium vulgare. Abundant in the neighbourhood of Sheffield, *J. Hardy:* common in many parts of the county; var. *immersum*, mihi, this elegant variety has the sori in small dots, which are sunk in deep pits in the frond, it occurs at Whitby; — *S. Gibson:* frequent near York and Castle Howard, *R. Spruce:* near York, *S. Thompson;* var. *serratum*, Wass-woods near Helmsley, *H. Ibbotson.*

Polypodium Phegopteris. Scarce near Sheffield, *J. Hardy:* in Cave-hole wood near Settle, *J. Tatham:* common at Hebden-bridge, Halifax, and many other parts of the county, *S. Gibson:* frequent about Halifax in rocky woods (R. Leyland), *H. C. Watson:* Scawton Howle near Helmsley, very fine, Buttercrambe-moor and Langwith lane, near York, Teesdale &c. (J. Backhouse, jun.), *R. Spruce:* Ingleborough, with P. Dryopteris, *W. Wilson:* near York, *S. Thompson:* Wensley-dale, Bell-hagg near Sheffield, Penhill, gill on Bellerby-moor, Shibden-dale, Ogden-clough &c. near Halifax, rocky woods in the vale of Todmorden frequent, near Helmsley;—*Baines's Yorkshire Flora;* Bolton-woods, *H. Ibbotson.*

Polypodium Dryopteris. Scarce near Sheffield; Anston-rocks, fourteen miles from Sheffield, plentiful, *J. Hardy:* a very common plant in the neighbourhood of Hebden-bridge, *S. Gibson:* Bolton-abbey (Churchill Babington), common in woods about Halifax, *H. C. Watson:* Castle-Howard park, on the lower calcareous grit; Whitstoncliff near Thirsk; in various parts of the North and West Ridings, almost exclusively on the sandstone (J. Backhouse, jun.), *R. Spruce:* Ingleborough, *W. Wilson:* Brimham-rocks, Teesdale; near Pickering, near Whitby, near Richmond, near Helmsley;—*Baines's Yorkshire Flora;* Rievaulx woods, Luilesworth-vale, Cave-hole woods, Bolton-woods, *H. Ibbotson.*

Polypodium calcareum. Plentiful on Anston-rocks, *J. Hardy :* abundant on our hills near Settle, *J. Tatham :* neighbourhood of Settle, where the plants are smaller than those from Lancashire, *S. Gibson :* hills above Settle; this species is exceedingly distinct from Dryopteris when growing (J. Backhouse, jun.), *R. Spruce :* Ingleborough with P. Dryopteris, *W. Wilson;* Ingleborough, (W. W. Brunton), from whom I have a specimen which is eight inches from tip to tip of the lowest pinnæ, and seven and a half from the base of the lowest pinnæ to the apex of the frond, *S. Thompson :* Arncliffe and Gordale (R. B. Bowman), *H. C. Watson :* several places in Gordale, *Baines's Yorkshire Flora.*

† Woodsia Ilvensis. Richmond (J. Wood), Francis' 'Analysis of British Ferns.'

Cystopteris fragilis. Uncommon in the neighbourhood of Sheffield, *J. Hardy :* Shibden and Beeston woods near Halifax, Settle, Knaresborough, and many other places in the county. The genus Cystopteris is said to affect limestone, but I always find the varieties growing much larger, and their forms better displayed, where there is no limestone. Mr. Francis lays great stress on the length of the rachis as a character whereby to distinguish the species; if he had been a fern-collector he would have known that this character depends very much on the situation in which the plant happens to grow, if, for instance, among loose stones, the rachis will be long, if on a mortared wall, short. The same author also remarks that C. dentata is only half the size of C. fragilis, and double the size of C. alpina: my specimens of the form called fragilis vary from 2 to 18 inches in length, of that called dentata from 4 to 16 inches, and of the Low Layton plant from 1 to 8 inches; *S. Gibson:* Shibden-dale near Halifax (R. Leyland), *H. C. Watson;* on the obelisk-bridge, Castle-Howard park; on old walls &c. in various parts of the north-eastern moors; near Helmsley, and in the long walk, Knaresborough (T. B. Powell); sparingly in Teesdale, growing in caves along with C. dentata, but keeping perfectly distinct in its habit, appearance of fronds &c. (J. Backhouse, jun.), *R. Spruce;* near Rievaulx-abbey, Helmsley, *H. Ibbotson;* abundant at Eggleston-bridge on the banks of the Greta, Red-scar, Applegarth; — *Baines's Yorkshire Flora.*

Cystopteris dentata. Very common near Settle, *J. Tatham;* Settle and other places, *S. Gibson;* Egglestone-abbey bridge, and many other places in Teesdale, very fine (J. Backhouse, jun.), *R. Spruce.*

Cystopteris angustata. Scarce in three places, Gordale and Attermine scars and Catterick-force, *J. Tatham;* I have found this variety growing on the very same plant with C. dentata, at Lune-bridge, Teesdale; they are no doubt the same species, (J. Backhouse, jun.), *R. Spruce:* near Aysgarth-bridge, Wensley-dale, *Baines's Yorkshire Flora.*

Cystopteris alpina or *regia.* Near Fountain's-abbey, and on wet rocks about Knaresborough, according to Teesdale in the 'Linnean Transactions,' and in Baines's Yorkshire Flora it is said to grow near Coxwold, but I have seen specimens from none of these localities, *R. Spruce.*

Polystichum aculeatum. Not common near Sheffield, *J. Hardy;* near Triangle, four miles from Halifax, and Highgreen woods, *S. Gibson;* woods near Halifax, (R. Leyland), *H. C. Watson;* Whitstoncliff, near Thirsk; on the magnesian limestone at Thorpe-arch and other places (J. Backhouse jun.), *R. Spruce;* Thorpe-arch (J. Ellis), *S. Thompson.*

Polystichum angulare. Edlington-wood near Doncaster, not common, *J. Hardy,* in endless variety in Beeston-woods, about seven miles north-east of Halifax, Shibden

and many other places near Halifax, Whitby, Richmond, &c. *S. Gibson;* Richmond, (R. B. Bowman), *H. C. Watson;* Whitstoncliff near Thirsk, on the magnesian limestone at Thorpe-arch and other places; I believe that angulare is a variety of lobatum and not of aculeatum (J. Backhouse jun.), *R. Spruce.*

Polystichum lobatum. Scarce in the Sheffield district, more common near Doncaster, *J. Hardy;* in all the woods in the neighbourhood of Hebden-bridge, *S. Gibson;* woods near Halifax (R. Leyland), a little below Catterick-force (J. Tatham), *H. C. Watson;* frequent in the stony woods about Castle-Howard, Thorpe-arch and Tadcaster, on the magnesian limestone (J. Backhouse, jun.), *R. Spruce;* near Settle (J. Tatham), *S. Thompson.*

Polystichum Lonchitis. Sparingly on the rocks above Settle, at an elevation of 1500 feet, *J. Tatham, S. Gibson;* Attermire-scar above Settle (J. Tatham), no fruit, I suspect this at least to be a young A. lobatum, *H. C. Watson;* Settle (J. Tatham), *S. Thompson*, who sends a frond, which appears to me to be the seedling, or perhaps, more properly speaking, the alpine form of aculeatum, *E. Newman;* near Malham, *W. Wilson.*

Lastræa Thelypteris. Potterie-carr, rare, *J. Hardy;* near York, in two or three localities. *S. Gibson;* abundant in Askham-bogs and Heslington-fields near York, fructifying in both places; Terrington-carr, amongst Bryum squarrosum and Hypnum nitens, *H. Ibbotson;* near Copgrove, near Doncaster, near Hovingham, near Settle, *Baines's Yorkshire Flora.*

Lastræa Oreopteris. Very common in the Sheffield district, *J. Hardy;* abundant above Swabeck, *J. Tatham;* very frequent in woods about Halifax (R. Leyland), *H. C. Watson;* frequent on the north-eastern moors, Castle-Howard park (very fine), wood near Earswick and Langwith-lane near York (J. Backhouse jun.), *R. Spruce.*

Lastræa Filix-mas. Abundant in the Sheffield district, *J. Hardy;* very common near York, *R. Spruce, S. Thompson.*

† Lastræa cristata. On Plumpton-rocks near Knaresborough, *Baines's Yorkshire Flora.* There is at present no other information about this species, *E. Newman.*

Lastræa rigida. Wharnside and Ingleborough, *W. Wilson;* on the rocks above Settle, at an elevation of 1500 feet, *J. Tatham;* Attermire-rocks and other places in the neighbourhood of Settle, *S. Gibson*, (J. Backhouse, jun.), *R. Spruce;* Clay-pit scar above Settle (J. Tatham), *H. C. Watson;* first gathered in 1815 on Ingleborough, near the foot of the mountain, towards the neighbouring village (W. T. Bree), *Newman's British Ferns.*

Lastræa dilatata. Abundant and very variable in the Sheffield district, *J. Hardy;* common in all the lanes and woods about Hebden-bridge &c. in endless variety, *S. Gibson;* very frequent near Halifax (R. Leyland), Black forest, Richmond (Rev. J. E. Leefe), both these appear to me very near spinulosa, *H. C. Watson;* the commonest fern in wet woods at Castle-Howard, Stockton forest, Leckby-carr &c. (J. Backhouse, jun.), *R. Spruce;* near York, *S. Thompson.*

Lastræa spinulosa. Spinulosa? Potterie-carr near Doncaster, *J. Hardy;* Scarborough-mere, *S. Gibson;* bog near Rufforth-grange, Langwith, Stockton-forest, Thorne-moor, Leckby-carr &c. (J. Backhouse jun.), *R. Spruce;* near York, a singular variety is found at Thorne-moor, *S. Thompson.*

Lastræa dumetorum. In stony places in Castle-Howard park, *R. Spruce.*

Athyrium Filix-femina. Abundant in the Sheffield district, *J. Hardy;* in endless variety in many places, *S. Gibson;* shady banks near York, frequent, Langwith, *S. Thompson, R. Spruce.*

Athyrium irriguum. Occurs occasionally in the Sheffield district, *J. Hardy;* Midgpool-lane near Hebden-bridge; Mr. Francis observes that this plant is very tender and without fruit; the specimens which Sir J. E. Smith sent to his correspondents are very rigid, and bear fruit very abundantly, *S. Gibson.*

† Asplenium fontanum. I found a single root of this plant on an old wall above Skipton-castle, in July 1835; I took all the fronds and the plant, of course, disappeared; and I have a specimen of the plant given to me as a Teesdale plant, but perhaps under some mistake, *S. Gibson.*

† Asplenium lanceolatum. On a wall in the village of Wharfe (Bolton), *Turner & Dillwyn*, 723.

Asplenium Adiantum-nigrum. Rather uncommon in the Sheffield district, *J. Hardy;* near Halifax and other places, *S. Gibson;* Old walls in Ray-wood, Castle Howard; on the moors near the Hole of Horcum; on the banks of the Greta, and many other places in Teesdale, Whitstoncliff &c. (J. Backhouse jun.), *R. Spruce;* rocks at Ampleforth near Helmsley, walls on the moors above Pickering, *H. Ibbotson.*

Asplenium Ruta-muraria. Common in the Sheffield district, *J. Hardy;* on the walls of Skipton-castle, near Hebden-bridge, *S. Gibson;* old walls, bridges &c. near York and Castle Howard, *R. Spruce;* York city-walls, *S. Thompson.*

† Asplenium septentrionale. Ingleborough-hill (Mr. Tofield). It does not appear to have been found by any subsequent botanist;—*Turner and Dillwyn*, 723. I have seen specimens from Ingleborough, and think it is probably there yet. *J. Backhouse, jun.*

Asplenium marinum. On the cliffs north of Scarborough, very rare, *S. Gibson.*

Asplenium Trichomanes. Common in the Sheffield district, *J. Hardy;* High-green woods and many other places, *S. Gibson;* old walls in Ray-wood, Castle Howard, Knaresborough, (T. B. Powell); on an oolitic limestone crag at Crambeck, near the Derwent; near the Hole of Horcum; on the magnesian limestone at Thorpe-arch; Whitstoncliff near Thirsk, where I find a variety with divided fronds, (J. Backhouse), *R. Spruce;* Near Pontefract, *S. Thompson;* a variety with the fronds deeply divided grows on the Whitstoncliff near Thirsk, *Baines's Yorkshire Flora.*

Asplenium viride and the ramose variety, very common near Settle, *J. Tatham;* common at Green-hill, Settle and other parts of Craven; var. *ramosum*, Ogden-kirk near Halifax; var. *acutifolium* mihi, with the pinnæ very long and pointed, this beautiful and very distinct variety was found near Settle by Dr. Chorley of Leeds, to whom I am indebted for specimens, *S. Gibson;* Aislabeck, Richmond (James Ward), Gordale (R. B. Bowman), *H. C. Watson;* specimens from near Halifax, *W. Wilson;* Cronkley-fell and many localities in Teesdale, on the limestone (J. Backhouse jun.), *R. Spruce;* Gilla-leys wood; walls on the moors near Pickering, *H. Ibbotson;* Ingleborough, Widdale-fell, Wensley-dale, Reeth-moor in Swaledale, Hill-gill near the side of the brook, *Baines's Yorkshire Flora.*

Scolopendrium vulgare. Common in the Sheffield district; var. *crispum*, plentiful near Sprotborough, two miles from Doncaster; var. *undulatum*, in Edlington-wood and on Warmsworth-cliff near Doncaster; var. *ramosum*, one plant on rocks near Sprotborough, *J. Hardy;* on the sea-coast at Scarborough, and on the hills above Settle, *S. Gibson;* Thorpe-arch (J. Backhouse, jun.); in the Long walk Castle-bank, and at Knaresborough (T. B. Powell); old walls near Castle Howard, peculiarly abundant in Mowthorpe-dell, where I have gathered many varieties; *R. Spruce;* Plumpton-park near Harrogate (J. Richardson), *S. Thompson.*

Ceterach officinarum. On the rocks above Malham-tarn near Settle, *J. Tatham, S. Gibson;* on the old walls of Kirklees-park, near Halifax, *S. Gibson.*

† Trichomanes speciosum. Found by Dr. Richardson at Belbank, scarce half a mile from Bingley, at the head of a remarkable spring, and nowhere else (Ray, Syn. 128, pl. iii. fig. 3); in September, 1782, I found this rare plant in Belbank-wood near Bingley, the place mentioned in Ray's Synopsis (Mr. Teesdale, in his Supplement to 'Plantæ Eboracenses,' published in the 'Transactions of the Linnean Society of London); Trichomanes brevisetum was certainly found near Bingley by Bolton, I have seen a specimen from that place, *S. Gibson;* it was figured in 'English Botany,' pl. 1417 [1445, new edit.] from specimens collected in this locality, but I understand it does not now exist there, *R. Spruce;* it was figured by Bolton from a specimen from Belbank-wood near Bingley; the spring-head near which it was found is now walled in to supply the town of Bingley with water, but the wood is very large, and it is very likely to be somewhere else in the neighbourhood, *J. Backhouse, jun.*

Hymenophyllum Wilsoni. Turner-clough, seven miles from Halifax on the Oldham road, *S. Gibson;* rocks near Lower Harrogate (J. Backhouse jun.), *R. Spruce;* Greenfield, *W. Wilson.*

Hymenophyllum Tunbridgense. Near Todmorden, *S. Gibson;* on rocks by a stream running down to the sea at a place called Hayburn-wyke, near Whitby (Mr. Peterkin), *R. Spruce;* near Halifax and at Greenfield, *W. Wilson.*

Osmunda regalis. Rare about Sheffield, more plentiful in the Doncaster district, *J. Hardy;* Ayton-forge near Scarborough, *S. Gibson;* Askham-bogs; Langwith-moor; Wheldrake-lane (J. Backhouse jun.); bog near Haigh-park windmill, Knaresborough (R. B. Powell), *R. Spruce;* Beck-hole near Whitby, *Baines's Yorkshire Flora.*

Botrychium Lunaria. Widely distributed in the Sheffield district, but never occurring in any quantity, *J. Hardy;* abundant in Tarn-field pasture near Settle, *J. Tatham;* Midgley-moor, *S. Gibson;* near Halifax, in dry fields, not very plentiful (R. Leyland), *H. C. Watson;* very fine in pastures at Ganthorpe near Castle Howard; near Coneysthorpe; Terrington-carr; Knavesmire, York; wood near Earswick; Low Harrogate (J. Backhouse jun.), *R. Spruce;* Airyholme near Hovingham, above the wood bridge that crosses the Tees to Lower Cronkley, and at Moor-riggs in Teesdale; Cotherstone-fell; on the Hambleton hills, frequent; near Whitby; Halves-farm pastures near Knaresborough; near Richmond; *Baines's Yorkshire Flora.*

Ophioglossum vulgatum. Common in the Sheffield district, *J. Hardy;* common in many places, *S. Gibson;* Round Howe near Richmond (James Ward), *H. C. Watson;* abundant in old pastures and woods around Castle Howard, where I have seen plants six inches high, growing amongst Equisetum fluviatile; not unfrequent near York, *R. Spruce;* damp meadows near York, abundant, *S. Thompson;* Ganthorpe-moor, Langwith, near York, *H. Ibbotson.*

Lycopodium clavatum. High moors five miles from Sheffield, abundant, *J. Hardy;* very sparingly on moors in the vale of York, as on Stensall, Stockton-forest, &c. but abundant on all the moors in the north riding, *R. Spruce;* Stockton-common near York (J. Backhouse, jun.), *S. Thompson;* Terrington-carr (H. Ibbotson to J. Storey), *H. C. Watson;* Midgley-moor, *S. Gibson;* common on elevated moors, *H. Ibbotson.*

Lycopodium alpinum. High moors five miles from Sheffield, not common, *J. Hardy;* very common on Cronkley-fell and many other places in Teesdale (J. Backhouse jun.), Hutton Bushel moor, near Scarborough (Mr. Peterkin), *R. Spruce;* very

abundant on the side of Ingleborough, near the summit; Aislaby low moor near Whitby; on Sowerby, Wadsworth and Midgley moors, frequent; *Baines's Yorkshire Flora;* Cronkley-fell, Teesdale, Pen-y-ghent (R. B. Bowman), *H. C. Watson.*

Lycopodium inundatum. Plentiful in various parts of Strinsall and Towthorpe moors, as well as in Stockton-forest; Terrington-carr, scarce, *R. Spruce;* Stockton-common, *S. Thompson, S. Gibson;* in a sand-pit on the Malton-road, four and a half miles from York; Norland-moor near Halifax, *Baines's Yorkshire Flora;* Shackle-moor near Castle-Howard, *H. Ibbotson.*

Lycopodium selaginoides. Stockton-forest; Welburn-moor near Castle Howard; Teesdale, (J. Backhouse, jun.); Goldsbro'-moor near Knaresborough (J. B. Powell); Hackness near Scarborough (Mr. Peterkin), *R. Spruce;* Stockton-common, *S. Thompson;* on a part of the moor opposite the poor-houses in Wheldrake-lane, four miles east of York; on an island just above the bridge that crosses the Tees to Lower Cronkley; various places near Settle; in a marshy place on the moor north-west of the Beacon, near Richmond; on the top of Whitstoncliff near Thirsk; *Baines's Yorkshire Flora;* near the beacon, Richmond (James Ward), Towthorpe-moor (J. Storey), *H. C. Watson.*

Lycopodium Selago. High moors five miles from Sheffield, not common, *J. Hardy;* sparingly on Stockton-forest and Slingsby-moor, but not unfrequent on the north-eastern moors, *R. Spruce;* Pen-y-ghent and Ingleborough (J. Tatham), *S. Thompson;* near Settle, abundant; Penhill; moors near Halifax, Todmorden &c., *Baines's Yorkshire Flora;* Pen-y-ghent (R. B. Bowman), *H. C. Watson;* High-green woods, and many other places in the county, *S. Gibson.*

Isoetes lacustris. Castle-Howard lake; in the Foss reservoir near Coxwould, *H. Ibbotson.*

Pilularia globulifera. Stockton-common near York, Scarborough-mere &c. *S. Gibson;* margin of Gormire-pool near Thirsk, *H. Ibbotson;* Gormire, at the base of Whitstoncliff; Stockton-forest near York, (O. A. Moore); and near Richmond, *Baines's Yorkshire Flora.*

Equisetum hyemale. By the Derwent at Crambeck; near Raskelf (J. Backhouse jun.), *R. Spruce;* from Wakefield to Pontefract; Goodland-dale near Whitby; Hackness near Scarborough; near Halifax, *Baines's Yorkshire Flora;* dry woods at Castle Howard and Kirkham, not common (Teesdale), about Leeds but rare (Rev. W. Wood), Hackfall (Rev. J. Dalton) &c. *Turner & Dillwyn;* Bolton-woods in Wharfedale, *S. Gibson;* by the banks of a rivulet at Conesthorpe, *H. Ibbotson.*

Equisetum variegatum. Near Winch-bridge, and other places in Teesdale, *S. Gibson, C. C. Babington,* (J. Backhouse) *R. Spruce; H. Ibbotson.*

Equisetum palustre. Common in the Sheffield district, *J. Hardy*; abundant near York, particularly in ditches by the river Foss and in Hob-moor brick-ponds; not unfrequent throughout the district, *R. Spruce;* common, we have three or four varieties of this species, some of them not uncommon, *S. Gibson.*

Equisetum limosum. Plentiful in the Sheffield district, *J. Hardy;* abundant near York, particularly in ditches by the river Foss, and in Hob-moor brick-ponds; not unfrequent throughout the district, *R. Spruce;* at the bottom of Wensley-dale, *Baines's Yorkshire Flora;* common, we have two forms of this plant, perhaps as distinct as E. Mackaii from E. variegatum, one, much smaller and having fewer teeth on the sheaths, grows in the canal near Hebden-bridge, the other and larger plant grows near Selby, *S. Gibson.*

Equisetum sylvaticum. Not common in the Sheffield district; I have never ga-

thered it in fruit; a slender variety with the branches much attenuated is sometimes met with, *J. Hardy;* moist meadows at Ganthorpe near Castle Howard, *R. Spruce;* Goadland-dale near Whitby; near Green Hammerton, Settle, Richmond, Leeds &c.; by the brook at Hesketh-grange, near Boltby, Arncliff woods, *Baines's Yorkshire Flora;* common, *S. Gibson.*

Equisetum arvense. Too common in the Sheffield district, *J. Hardy;* moist meadows, cornfields &c. frequent, *R. Spruce;* common, *S. Gibson, H. Ibbotson.*

Equisetum fluviatile. Frequent near Castle Howard, especially in boggy woods, where I have seen branched fronds a foot high, surmounted by catkins; Langwith, Stockton and other places near York, also near Malton (J. Backhouse jun.), *R. Spruce;* in the Roche at Roche-abbey; roadside between Thornburgh and Upsall; wood on Wass-bank on the road to Helmsley; Arncliff wood, *Baines's Yorkshire Flora;* Lombard's-clough near Todmorden, *S. Gibson.*

EDWARD NEWMAN.

(To be continued).

ART. CX.—*Additions to the Phænogamic Flora of ten miles round Edinburgh.* By THOMAS EDMONSTON, jun. Esq.

(Continued from p. 407).

PLANTS NOT PREVIOUSLY OBSERVED IN THE DISTRICT.

Plantago Coronopus, var. *β. nana.* Abundant near Granton, and elsewhere.

Symphytum officinale, var. *β. patens.* Near Muttonhole, &c.

SPECIES PREVIOUSLY OBSERVED.

Geranium rotundifolium. Very fine at Preston-pans.

Geum intermedium. Abundant in many places, as at Roslin, Hawthornden, &c. Is this a species or not?

Habenaria chlorantha, Bab. After observing this plant very attentively for some time, and comparing it with the allowed H. bifolia, and with specimens from the Edinburgh Botanical Society, from Mr. Babington, and other eminent botanists, of their H. chlorantha, I must say that I cannot see permanent grounds of specific distinction. The extreme forms appear very unlike, but the intermediate ones are so very common, that it appears to me there are scarcely sufficient reasons for separating the plants. I should much like to see in 'The Phytologist' a record of the observations of some botanist familiar with the plants in a living state.

Hieracium sabaudum. One of the most common Edinburgh hawkweeds.

Hordeum pratense. Not now to be found in the district; some fine specimens occurred to Dr. Neill in the King's Park many years since.

Juncus obtusiflorus. Pentland Hills. A curious viviparous variety of J. supinus (J. uliginosus), with half-prostrate stems from a foot to two and a half feet long, occurs with the preceding in the marshes near Collinton.

Lamium Galeobdolon and *rugosum.* Dalkeith Park. L. album, *Linn.*, L. maculatum, *Linn.*, and L. rugosum, *Ait.*, appear to be correctly referred by some authors to states of the same species.

Leontodon palustre. Very abundant on the Pentland Hills and elsewhere near Edinburgh. From several years' observation of this plant in Shetland and elsewhere, I am inclined to think it is a good species, although now generally sunk into a variety of L. Taraxacum. The characters drawn from the involucre appear to be constant in all the specimens I have seen; and it is by no means improbable that small specimens of L. Taraxacum have been confounded with palustre, for I have seen them growing together, and each preserving its distinctive characters.

Leontodon autumnale. Specimens of a curious variety of this plant having a very stout scape, and covered with a very dense, long, and silky pubescence, occur near Collinton. It is exactly similar to some specimens brought from the Outer Hebrides by Dr. Balfour and Mr. Babington last year, and exhibited at the Botanical Society.

Polygala vulgaris. I have observed some curious variations in the size of the leaves and sepals, and in the habit, of some Polygalas on Arthur's Seat, Braid, Blackford and Corstorphine hills, &c., and Mr. E. Forbes has registered the same. Whether these differences may prove sufficiently constant to constitute species, I must leave to future observers.

Potamogeton. Great numbers of this intricate genus are to be met with around Edinburgh, and, I have little doubt, forms (or species) different from those described, but I confess myself perfectly unable to distinguish many of the puzzling forms; and I do think that minute differences in the shape of the fruit are not always to be depended on.

Primula veris, α. Lin. (P. veris of authors), β. Lin. (P. vulgaris) and γ. Lin. (P. elatior of British botanists, P. acaulis, β. *caulescens,* Balfour and Babington). All these forms (for it seems now fully proved that they are no more) are common about Edinburgh.

Sedum reflexum. St. David's, Fife.

Senecio aquaticus, β. *erraticus*, and other curious states, occur at Duddingston-loch.

Stratiotes aloides. Abundant in a brook which runs into Duddingston-loch. This plant, and Butomus umbellatus, are said to have been planted in the above station, but I know not on what grounds.

Thalictrum flavum. St. David's, Fife.

Trifolium incarnatum. Aberlady, Haddingtonshire, apparently indigenous.

THOS. EDMONSTON, JUN.

Baltasound, Shetland,
November 27, 1842.

ART. CXI. — *Some Account of the Botanical Collections recently made by Dr. Theodore Kotschy (for the Wurtemburg Botanical Union) in Nubia and Cordofan.* Communicated by MR. WM. PAMPLIN, jun.

(Continued from p. 420)

WE will now proceed to give a complete enumeration of the species contained in the entire collection.

Marsileaceæ.
Marsilea nubica, *Al. Braun*

Alismaceæ
Alisma Kotschyi, *Hochst.*
enneandrum, *Hochst.*
Sagittaria nymphæfolia

Hydrocharideæ.
Udora cordofana, *Hochst.*
Nymphæa cærulea, *Savi*
ampla, *Cand.*
Lotus, *L.*

Gramineæ.
Cenchrus echinatus, *L.*
longifolius, *Hochst.*
macrostachys, *Hochst.*
Elytrophorus articulatus, *B.*
Cynodon Dactylon, *Pers.*
Digitaria ciliaris, *Koel.*
Chloris punctulata, *Hochst.*
spathacea, *Hoc.* [*W.*
Dactyloctenium ægyptiacum
Helopus annulatus, *Nees*
Schœnefeldia gracilis, *Kth.*
Lappago occidentalis, *Nees*
racemosa, *Schreb.*
Leptochloa arabica, *Kunth*
Aristida hordeacea, *Kunth*
Kotschyi, *Hochst.*
meccana, *Hochst.*
Sieberiana, *Trin.*
stipiformis, *Lam.*
plumosa, *L.*
uniglumis, *Lichst.*
Setaria imberbis, *R. S.*
verticillata, *Beauv.*
Pennisetum lanuginosum *H.*
Gymnothrix nubica, *Hochst.*
Panicum arvense, *Kunth*
turgidum, *Forsk.*
subalbidum, *Kunth*
Petiverii, *Kin.*
Kotschyanum, *Hoch.*
Sporobolus glaucifolius, *H.*
Crypsis schœnoides, *Lam.*
Oryza sativa, *L.* [*Forsk.*
Andropogon annulatus,
Gayanus, *Kunth*
nervatus, *Hochst.*
Sorghum saccharatum, *Per.*
halapense, *Pers.*
Diplachne elongata, *Hoch.*
alba, *H.*
poæformis, *H.*
Poa ciliaris, *L.*
Eragrostis tremula, *H.*
pilosa, *Beauv.*
megastachya, *Link*
Triachyrum cordofanum, *H.*
Ctenium elegans, *Kunth*

Cyperoideæ. [*Rttb.*
Cyperus conglomeratus,
elongatus, *Sieb.*
aristatus, *Sieb.*

Cyperus retusus, *Nees*
squarrosus, *L.*
lepidus, *Hochst.*
Lamarckianus, *Schult.*
resinosus, *Hochst.*
pygmæus, *Rottb.*
rotundus, *L.*
vulgaris, *Kunth*
Fimbristylis hispidula, *Kth.*
dichotoma, *Vahl.*
Isolepis prælongata, *Nees*
Heleocharis monandra, *H.*

Commelinaceæ.

Commelina subaurantiaca, *H*
Forskaolii, *Vahl*

Juncaceæ.

Tenagocharis alismoides, *H.*

Palmeæ.

Cucifera thebaica, *Del.*

Coronarieæ.

Asphodelus fistulosus, *L.*

Characeæ.

Chara brachypus, var. nubica, *Al. Braun*

Amentaceæ.

Salix — sine flor.

Urticaceæ.

Ficus glumosa, *Caill.*

Nyctagineæ.

Boerhaavia hirsuta, *W.*
repanda, *W.*
vulvariæfolia, *Poir.*

Aristolochieæ.

Aristolochia Kotschyi, *Hch.*

Laurineæ.

Cocculus Bakis, *A. Rich.*

Plumbagineæ.

Plumbago auricul[illegible], *Lam.*

Rubi[illegible]

Spermacoce [illegible]pacta, *Hch.*
leuco[illegible], *H.*
Borreria r[illegible]ata, *Cand.*
Mitroca[illegible] senegalensis, *C.*
[illegible]niatus, *Hochst.*
Ko[illegible]utia strumosa, *Hochst.*
senegalensis, *Cham.* No. 138.
cæspitosa, *Schnizl.*

Compositæ.

Dicoma tomentosa, *Cass.*
Schaffnera carduoides, *Sch.*
Diplostemma acaule, *C. H.*
alatum, *Hchs* [*Schlt*
Sphæranthus angustifolius,
nubicus, *Sch.*= [*Cnd.*
Sprunera alata, *Schultz*
Vernonia paucifolia, *Less.* β.
angustifolia
Ageratum conyzoides, *L.*
Bidens bipinnata, *L.*
Ethalia gracilis, *Cand.*
Pluchea Kotschyi, *Schltz.*
Gnaphalium niliacum, *Rad.*
Cotula cinerea, *Del.*
anthemoides, *L.*
Inulaster Kotschyi, *Schultz*
Pulicaria undulata, *Cand.*
Francœuria crispa, *Cass.*
Doellia Kotschyi, *Schultz*
Pegolettia senegalensis, *Cas.*
Stengelia Kotschyana, *Hch.*
Blainvillea Gayana, *Cass.*=
Eisenmannia clandestina, *S.*
Hinterhubera Kotschyi, *Sch*
Eclipta erecta, *L.*
Sclerocarpus africanus, *Jacq*
Dipterotheca Kotschyi, *Sch.*
Microrhynchus pentaphyllus,
Sonchus cornutus, *Hoc.* [*Ho.*
Xanthium strumarium, *L.*

Cucurbitaceæ.

Bryonia fimbristipula, *Fenz*
Momordica crinocarpa, *Fnz*
Cymbalaria, *F.*
Balsamina, *L.*
Cyrtonema convolvulacea, *F*
Coniandra corallina, *F.*
Cucurbita exanthematica, *F*
Cucumis Bardana, *F.*
cognata, *F.*
ambigua, *F.*

Labiatæ et Verbenaceæ.

Moschosma polystachyum, *B*
Ocymum dichotomum, *Hch.*
lanceolatum, *Schum.*
menthæfolium, *Hchst.*
Leucas ciliata, *Bnth.* β. hirsuta
Leonotis pallida, *Benth.*
Verbena supina, *L.*
Holochiloma resinosum, *H.*
Volkameria Acerbyana, *Vis*
Asperifoliaceæ.
Echium setosum, *Del.*
Coldenia procumbens, *L.*
Heliotropium undulat. *Vhl.*
cordofanum, *Hochst.*
subulatum, *H.*
bicolor, *H.*
supinum, *L.*
pallens, *Caill.*
ovalifolium, *Forsk.*
indicum, *L.*
Cordia abyssinica, *Hochst.*
Anchusa asperrima, *Del.*

Convolvulaceæ.

Convolvulus pycnanthus, *H*
rhiniospermus, *H.*
filicaulis, *Vahl.*
lachnospermus, *H.*
microphyllus, *Sieb.*
Batatas pentaphylla, *Chois.*
auriculata, *Hochst.*
Ipomœa Kotschyiana, *Hch.*
coscinosperma, *H.*
gnaphalosperma, *H.*
coptica, *Roth*
repens, *Roth.*
palmata, *Frsk.*
cardiosepala, *H.*
pinnata, *H.*
acanthocarpa
sulphurea, *H.*
trematosperma, *H.*

Polygalaceæ.

Polygala erioptera, *Cand.*
eriopt. var. pubescens
obtusata, *Del.*

Personatæ.

A.—*Rhinantheæ.*

Striga orchidea, *Hochst.*
hermontica, *Del.*
Chascanum marrubiifol. *F.*
lacteum, *F.*

B.—*Acanthaceæ.*
Acanthodium hirtum, *Hoch.*
Monechma hispidum, *H.*
bracteosum, *H.*
Polyechma cæruleum, *Hch.*
Dipteracanthus patulus, *Nees*
Asteracantha macrurantha, *H*
Barleria Hochstetteri, *Nees*
Thunbergia annua, *Hochst.*
Thyloglossa sexangularis, *H*
= Rostellaria sexang. *H.*
palustris, *Hochst.* =
Gendurussa palustris, *H.*
Peristrophe bicalyculata, *N.*
Dicliptera spinulosa, *Hochst.*
Hypoëstes latifolia, *Hochst.*
Eranthemum decurrens, *H.*
C.—*Scrophularieæ.*
Macrosiphon elongatus, *H.*
fistulosus, *Hochst.*
Chilostigma pumilum, *Hchs*
Sutera serrata, *Hochst.*
dissecta, *Endl.*
Anticharis arabica, *Endl.*
D.—*Bignoniaceæ.* [*H.*
Ceratotheca melanosperma,
Sesamum rostratum, *Hochst.*
orientale, *L.*
Pedalium Caillaudii, *Del.*
Solanaceæ.
Solanum dubium, *Fres.* var.
aculeatiss.
Solanum nigrum, *L.*
albicaule, *Kotschy*
hastifolium, *Hochst.*
Capsicum conicum, *Meyer*
Physalis somnifera, *L.*
Lysimachiaceæ.
Utricularia inflexa, *Forsk.*
stellaris, *L.*
Asclepiadeæ.
Conomitra linearis, *Fenzl.*
Canahia Delilei, *Cand.*
Glossonema Boweanum, *C.*
Contortæ.
Hippion hyssopifolium, *S.*
Sapotaceæ.
Styrax officinalis, *L.*

W. PAMPLIN, JUN.

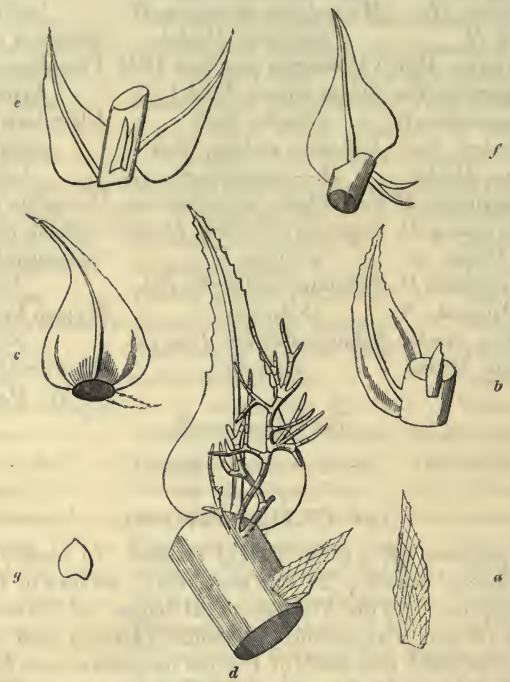
(To be continued).

ART. CXII.— *Varieties.*

242. *On the poisonous effects of the Seeds of Hemlock.* In Lindley's 'Introduction to the Natural System,' 2nd ed. p. 22, it is stated that "the fruit of the Umbelliferæ is in no case dangerous." In the 'Pharmaceutical Journal' of this month, p. 337, Dr. Pereira mentions the case of a gentleman who suffered severely from having drank an infusion of anise, in which *some* seeds of Conium maculatum were detected. From the expressions used by the Dr. I presume that they were not numerous. It appears to me very desirable that the point should be set at rest. Dr. Maton is quoted by Paris in his Pharmacologia, as stating that the value of Extractum Conii is much increased by including the seeds in the preparation. If any confidence is to be placed in the case detailed by Dr. Pereira, which is taken by him from the 'Journal de Chimie Medicale' for August, 1842, it would appear that an infusion of the seeds is infinitely more powerful than the extract usually procured in commerce, since Dr. John Davy has admistered the latter in drachm doses daily, with scarcely any untoward symptoms.—*Geo. Sparkes; Bromley, Kent, November* 5, 1842.

243. *On the folia accessoria of Hypnum filicinum*, Lin. A short time ago, whilst walking along the banks of one of our rivers, I happened to take up a tuft of that state of Hypnum filicinum which has been called H. fallax by Bridel, and on scrutinizing it with my pocket-lens, was surprised to observe, scattered here and there on the stem, several minute leaflets, scarcely one tenth so large as the true leaves, but yet resembling them in appearance. I brought the tuft home with me, and took an early opportunity of examining it with the microscope. I found these "folia accessoria" to occur chiefly towards the summit of the main stem, and more sparingly on the principal branches. In shape they are lanceolate, denticulate at the margins (*a*), and leafless (so far as I have observed), more delicate and with a wider reticulation than the true leaves. Sometimes they stand singly, as in figures *b*, *c*, *d*; not unfrequently several are found near each other, when they are smaller than usual; but most generally they stand in pairs, one leaflet partially overlying the other (*e f*). I observe them to be si-

tuated indifferently near the base or in the axil of a leaf, so that they cannot be considered stipules; but their most usual position is midway between two consecutive leaves.



Accessory leaves of Hypnum filicinum.

a—c. Accessory leaves standing singly. *d.* Accessory leaf and radicles. *e, f.* Accessory leaves occurring in pairs. *g* Leaf of a branch bud. All the figures are magnified.

My first impression was that they were *branch-buds;* but the *true* branch-buds, which exist copiously on elongations of the stems, are first displayed as little bulbs bursting forth from the stem, and are composed of closely packed and very minute leaves, of the shape represented at fig. *g*. Afterwards, remarking that the folia accessoria were confined to the upper part of the stem, while the lower part was profusely clothed with radicles. I thought it barely possible that the former might pass into the latter; but after a very careful scrutiny I detected several instances of the two organs occurring intermixed, and each preserving its characters unaltered; thus, the radicles, in their most rudimentary state, were jointed cylinders of a deep brownish-purple hue; while the accompanying folia accessoria were pale green, cellular, foliaceous expansions: an instance of their conjunction is figured at *d*. I may add that the folia accessoria are more abundant on the upper, the radicles on the under part of the stem. These peculiar appendages I believe have been hitherto unnoticed, although they certainly exist in every state of Hypnum filicinum with which I am acquainted; it is, however, singular that they should be absent from the very nearly allied species H. commutatum, at least my specimens do not show them. It is by no means improbable that other species of Hypnum may possess folia accessoria, which, from their minuteness, have been overlooked by previous observers; and perhaps this brief account of what I have myself noticed, may induce some of your correspondents, who have a love for musco-

logy, to make more extensive observations with a view of ascertaining the fact.—*Richard Spruce, F.B.S.E.; York, November* 16, 1842.*

244. *Information on Byssus barbata*, Eng. Bot. Your correspondent Mr. Lees requests information respecting Ozonium auricomum (Phytol. 428), the Byssus barbata of Withering and early English authors. This production was first denominated Ozonium auricomum by Link in 'Berlin Magazin,' and this generic title was confirmed by Persoon in the 'Mycologia Europæa.' It is not introduced in the second part of vol. v. of 'English Flora,' because Fries, Berkeley, and all the best mycologists of the present day, consider it best to exclude this and other doubtful productions from the catalogue of Fungi. The fructification of Ozonium is quite unknown, and this singular plant is believed to be an abnormal and barren state of some other Fungus, probably a Thelephora. I have sometimes fancied it bore some resemblance to Thelephora hirsuta, but this plant only grows on rotten wood and stumps of trees, whilst Ozonium auricomum is occasionally found on damp walls. The figure in Withering of its supposed fructification represents nothing possible. Although I fully concur in the propriety of excluding this plant, with the Rhizomorphæ and similar puzzling articles, from the body of mycological works, they are too interesting to be passed over without notice, and might, I think, be described in an Appendix, especially as most young fungists are disappointed by finding no mention made of them. Mr. Lees will find an admirable figure of Ozonium auricomum in Greville's 'Scottish Cryptogamic Flora,' iv. tab. 260; the description by Dr. G. contains all that is known concerning its structure, with the synonymy from the time of Dillenius upwards.—*H. O. Stephens;* 78, *Old Market-street, Bristol, December* 2, 1842.

245. *On the narrow-leaved Hypericum perforatum.* The narrow-leaved variety of Hypericum perforatum noticed in 'The Phytologist' for this month, (Phytol. 427), has been long known to me as a native of this island, where it is far from uncommon in similar situations with the ordinary form of the species, into which it passes by insensible gradations. Indeed the broad-leaved and normal state of H. perforatum is decidedly uncommon with us, though such a plant does occasionally occur, and makes a certain approach to H. dubium of Smith, in having but few pellucid dots upon the leaves, and one or more of the sepals is elliptical, oblong and obtuse, while the remainder preserve their usual acuteness of termination. I have never gathered the real dubium in flower, but I possess dried specimens in that state from others, and I found at Mucruss in October last what I take to be the genuine plant of 'English Botany' &c., but quite out of bloom, having *all* the sepals elliptical-oblong, rounded at the tip, and somewhat recurved; in habit the Irish plant was more like H. quadrangulum than H. perforatum, so similar indeed that I did not readily distinguish the two as they grew together, until more closely examined. My kind and liberal friend, Dr. Wood of Manchester, has pointed out to me since then the strongly marked pellucid reticulations of the leaves in H. dubium, when viewed by transmitted light, as affording an excellent character, in addition to those previously laid down for distin-

* Since writing the above, I have received a communication from Dr. Taylor (in answer to a letter enclosing Hypnum filicinum with folia accessoria), wherein he observes—"the name *filicinum* seems to have been applied almost prophetically to this species, which alone possesses these cauline scales that remind one of the ferns; they probably perform the same functions as the leaves, and yet they appear to be universally without nerves."—*R. S.*

guishing this rather obscure or ill understood species from the common H. perforatum. I collected seeds of the Killarney dubium for the purpose of testing its immutability under cultivation. The breadth of the leaves in our narrow forms of H. perforatum, varies extremely, as I before observed, being sometimes quite linear, more frequently however linear-oblong or linear-elliptical, with deflexed margins; in height, erect habit, and corymbose inflorescence, this variety agrees exactly with that described by Mr. Westcott. Besides being the H. veronense of Schrank, our variety seems to be the H. stenophyllum of Opitz, Winn. et Grab. Fl. Siles. ii. 82; H. perforatum, δ. angustifolium, Gaud. Fl. Helv. iv. 628; whilst our less common broad-leaved state I suppose identical with Gaudin's H. perforatum, β. latifolium, l. c. s., and of Koch in the enlarged edition of Röhling's 'Deutschland's Flora,' Vter band. s. 349, a work unequalled for laborious research and accuracy of detail. Gaudin's description of our narrow leaved perforatum, leaves no doubt that his Swiss plant is absolutely the same as the British one. — *Wm. Arnold Bromfield;* * *Eastmount, Ryde, Isle of Wight, December* 3, 1842.

246. *Curious state of Carex panicea.* I have lately received a curious variety of Carex panicea, which I do not find noticed in any work on British plants. It differs from the common state of the plant in having *double perigynia*, the second or upper ones with their peduncle passing through the orifice of the first or lower ones; the lower perigynia also have the usual number of stigmas. As such forms are not common amongst the Carices, perhaps it may be interesting to some of the readers of 'The Phytologist' to know that they do occasionally occur. The plant was found at Bristol, in June, 1842, by Miss Wood, Liverpool-road, Islington, to whom I am indebted for the specimen.—*Samuel Gibson; Hebden Bridge, December* 5, 1842.

247. *Hierochloe borealis*, (Phytol. 426). In August, 1836, I went with a party of botanists to seek for this plant in *Glen Cally*, which is within three or four hours' walk from the Spittle of Glen Shee. Unfortunately we set out in the afternoon, and did not reach the place until the day was far spent; so that before we had penetrated the recesses of the Glen, the evening shadows warned us to depart. The fatigues and the dangers of our return by a shorter but untried route across the mountains, and our descent long after sunset, will not soon be forgotten. Had time permitted, I have no reason to think that we should have been unsuccessful in our search for this plant.—*W. Wilson; Orford Mount, near Warrington, December* 10, 1842.

248. *Supposed new British Fern.* On recently comparing the specimens of Adiantum Capillus-Veneris, gathered by Mr. Ward at Ilfracombe in Devonshire, in 1840, with one from the Isles of Arran, given to me when in Ireland, by Mr. Reilly of Galway, I found a marked difference in the general character and habit of the two plants; and on closer inspection I discovered in the footstalks of the leaves a difference which appeared perfectly constant, so far as the specimens before me are concerned. In the Arran specimen each pinnule is articulated to a somewhat capitate footstalk, from which it may be separated by a very slight touch: in this character as well as in the form of the pinnules, it appears identical with a common West Indian species which I suppose to be the Adiantum fragile of Willdenow's 'Species Plantarum.' My object in publishing this supposed discovery in its present crude form, is to invite those botanists who happen to possess specimens from both localities, to compare them, with a view of establishing or disproving my conjecture. —*Edward Newman; December* 10, 1842.

* In a letter to E. Newman.

Art. CXIII.—*Proceedings of Societies.*

BOTANICAL SOCIETY OF EDINBURGH.

Wednesday, December 7.—Prof. Christison in the chair. The election of office-bearers for the season took place:—Dr. Neill, President; Professors Christison, Graham, Balfour and D. Stewart Esq., Vice-presidents. Various parcels of plants were announced, also donations to the library from Dr. Müller of Emmerich, Dr. Maly, &c.

Professor Christison then submitted to the Society a highly interesting communication on the Assam tea-plant, illustrated by specimens. The author stated that the different kinds of tea were produced by different modes of preparation, and showed by a series of examples of the preserved tea-leaf, that the various forms were merely varieties of the same plant. A specimen of tea, of a yellow colour, and of a remarkably strong flavour, was exhibited; also tea, in the form of small rolls, sent to this country about twenty years ago, as a present from the Emperor of China to George IV.

Mr. Goodsir then read a paper by Charles C. Babington, Esq., F.L.S., F.GS., entitled "Observations upon a few plants, respecting the claim of which to be considered as natives of Great Britain, Sir W. J. Hooker expresses doubt in the 5th edition of his 'British Flora,' with a few notes upon other species contained in that work, with reference to the Edinburgh 'Catalogue of British Plants.' The object of this paper was to show upon what evidence the authors (Professor Balfour, Mr. Babington himself, and Dr. Campbell) of the Botanical Society's 'Catalogue of British Plants' had included in it the species concerning which Sir W. J. Hooker expresses doubt. "I cannot allow this opportunity to pass," says the author of this paper, "without expressing the great satisfaction which it gives me to see that so distinguished a botanist as Hooker has considered the catalogue deserving of quotation *throughout his work*, as I must consider it a proof that the compilers of the 'Catalogue of British Plants' have not produced a work discreditable either to themselves or to the Society that intrusted its preparation to them."

Mr. Brand afterwards read to the Society a "Notice of the presence of Iodine in some plants growing near the sea," by G. Dickie, M.D., Lecturer on Botany in the University and King's College, Aberdeen. The author found, by chemical examination of specimens of *Statice Armeria*, from the sea-shore, and of others from the inland and higher districts of Aberdeenshire—that the former contained iodine, and that soda was more abundant in them, while potass prevailed in the latter. Iodine was also found in *Grimmia maritima*, and Mr. P. Grant of Aberdeen, has found it in *Pyrethrum maritimum*. An analysis was made of examples of *Statice Armeria*, *Grimmia maritima*, *Lichina confinis* and *Ramalina scopulorum*, all growing near the same spot, and occasionally during storms exposed to the sea spray; and all these plants, with the exception of the lichen, contained iodine. The specimens having been washed previous to analysis, the iodine could not have been derived from saline incrustation. All these vegetables were healthy, and the author of the paper has been led to conclude that marine Algæ are not the only plants which possess the power of separating from sea-water the compounds of iodine, and of condensing them in their tissues, and this without any detriment to their healthy functions.

BOTANICAL SOCIETY OF LONDON.

November 18.—Adam Gerard Esq. in the chair. Donations of British plants were announced from Miss S. B. Hawes and Miss S. K. Barnard. The continuation of the paper commenced at the last meeting, on the *Lodoicea Sechellarum*, by George Clark, Esq., was read.

The Lodoicea Sechellarum is an intertropical plant peculiar to the Sechelles Archipelago, where it grows naturally in two islands only, Praslin and Curiense. Praslin lies to the north-east of Mahè, distant twenty-one miles; Curiense to the north of Praslin, and is much smaller: a deep arm of the sea, from one to two miles in breadth, separates these two islands. They lie between 4° 15' and 4° 21' S. latitude, and 55° 39' and 55° 47' E. longitude. In the other islands of the Archipelago there are but few Lodoiceas, which have all been planted, and only two or three appear to thrive.

The trunk or stem is straight, and rises to the height of 80 or 90 feet, and is terminated by a splendid crown of winged palmated leaves; it is only from 12 to 15 inches in diameter, and so flexible that it waves to the slightest breeze. When the wind is moderately strong, the huge leaves of this giant palm are clashed together with an astonishing noise. The outside of the stem is very hard and compact, while the interior is soft and fibrous. The leaves, winged and palmated, open like a fan, and in their early growth are more than 15 feet long, without reckoning the foot-stalk, which is at least as much more. In the mature trees the leaf-stalk is not more than 8 or 10 feet long, and the whole leaf does not exceed 20 feet in length by 10 or 12 in breadth, and is entirely destitute of thorns. The nascent leaves are enveloped till the period of their expansion by a thick covering of cottony down, of a nankeen colour; but this is occasionally wanting. The unanimous testimony of the inhabitants of Praslin proves that each tree produces only one leaf a-year; and "as three leaves occupy about 8 inches of the trunk, and twenty years expire before that appears above the surface, a tree of eighty feet in height must be about four hundred years old." The flowers, about twenty in number, succeed each other one at a time, occasionally there are two together. The nuts are two-lobed, and sometimes two nuts are enclosed in one husk; three-lobed nuts are very rare, but some are met with, and it is said that specimens with five lobes have been found. The form of the nut is very singular, and cannot be compared with that of any other production of the vegetable kingdom. Two highly remarkable circumstances in the history of the Lodoicea are the duration of its blossoms and the period necessary for maturing its fruits; for the latter purpose seven or eight years are required. The Lodoicea grows in every variety of soil, but delights most in the vegetable mould of the deep gorges of the mountains. It is nevertheless found on the bare mountain tops, and forms a very conspicuous and remarkable object in such situations. It is curious that the vegetation of the nut should be prevented by its being buried, but if suffered simply to rest on the earth, in a situation not too much exposed to the sun, germination readily takes place. The purposes to which the produce of the Lodoicea is applied are numerous. The fruit, in its simple state, is an agreeable and refreshing aliment; when ripe it yields oil; its germ furnishes a very sweet food. Of the shell are made vessels of various shapes and sizes, that serve the Sechellois for nearly all domestic purposes. The entire nut is an article of commerce with India, where one of its uses is as an astringent medicine. The trunk is employed in building; split and hollowed it forms excellent gutters and paling; the leaf-stalks also are used for the latter purpose. The leaf forms a covering for roofs nearly as good as shingles, besides furnishing materials of a very superior description for hats, bonnets, wood-baskets and artificial flowers, in the manufacture of which many of the Sechelloises display great taste and skill. And lastly, the cottony down which covers the leaf previously to expansion, is a very good stuffing for pillows and mattresses.—*G. E. D.*