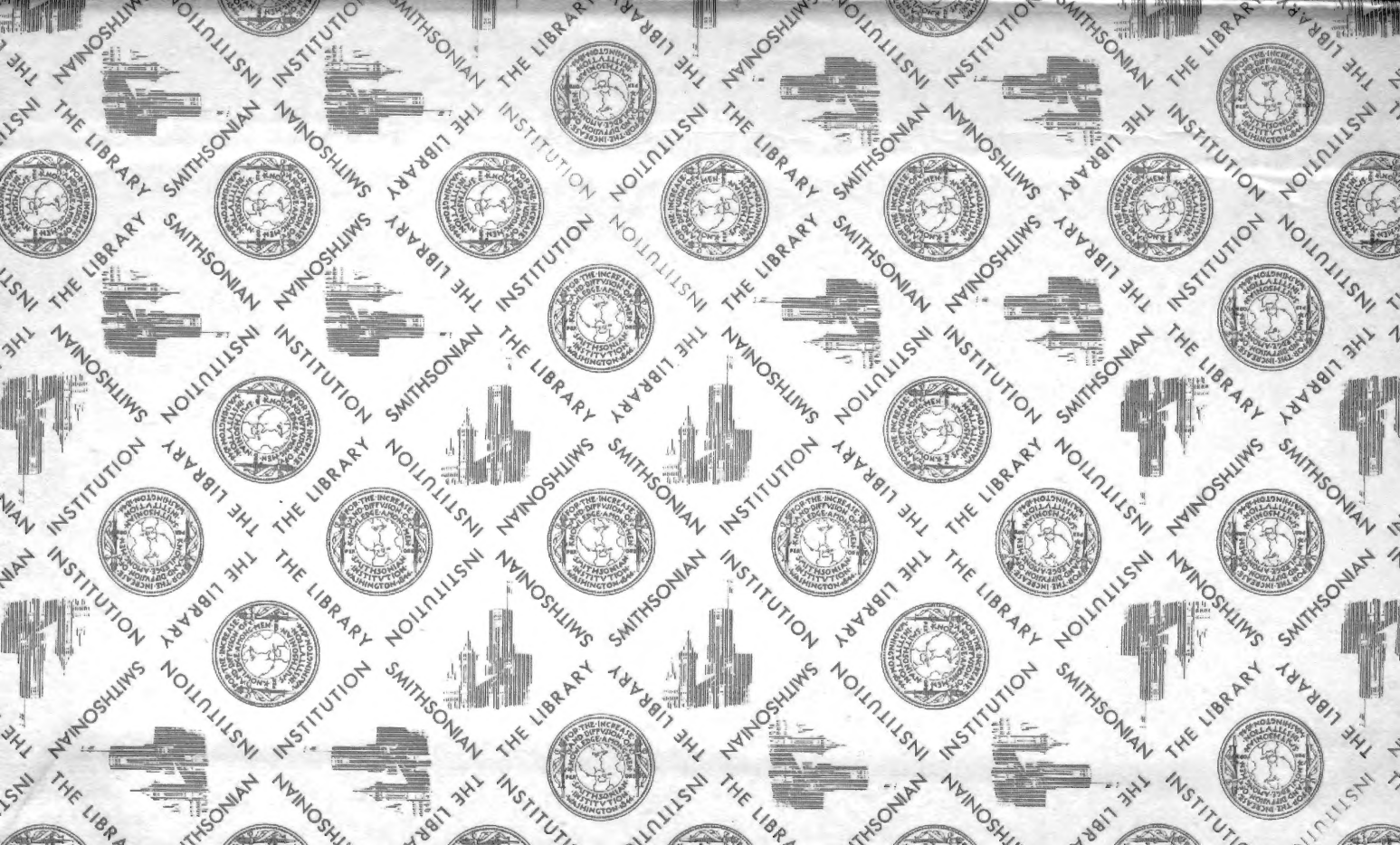
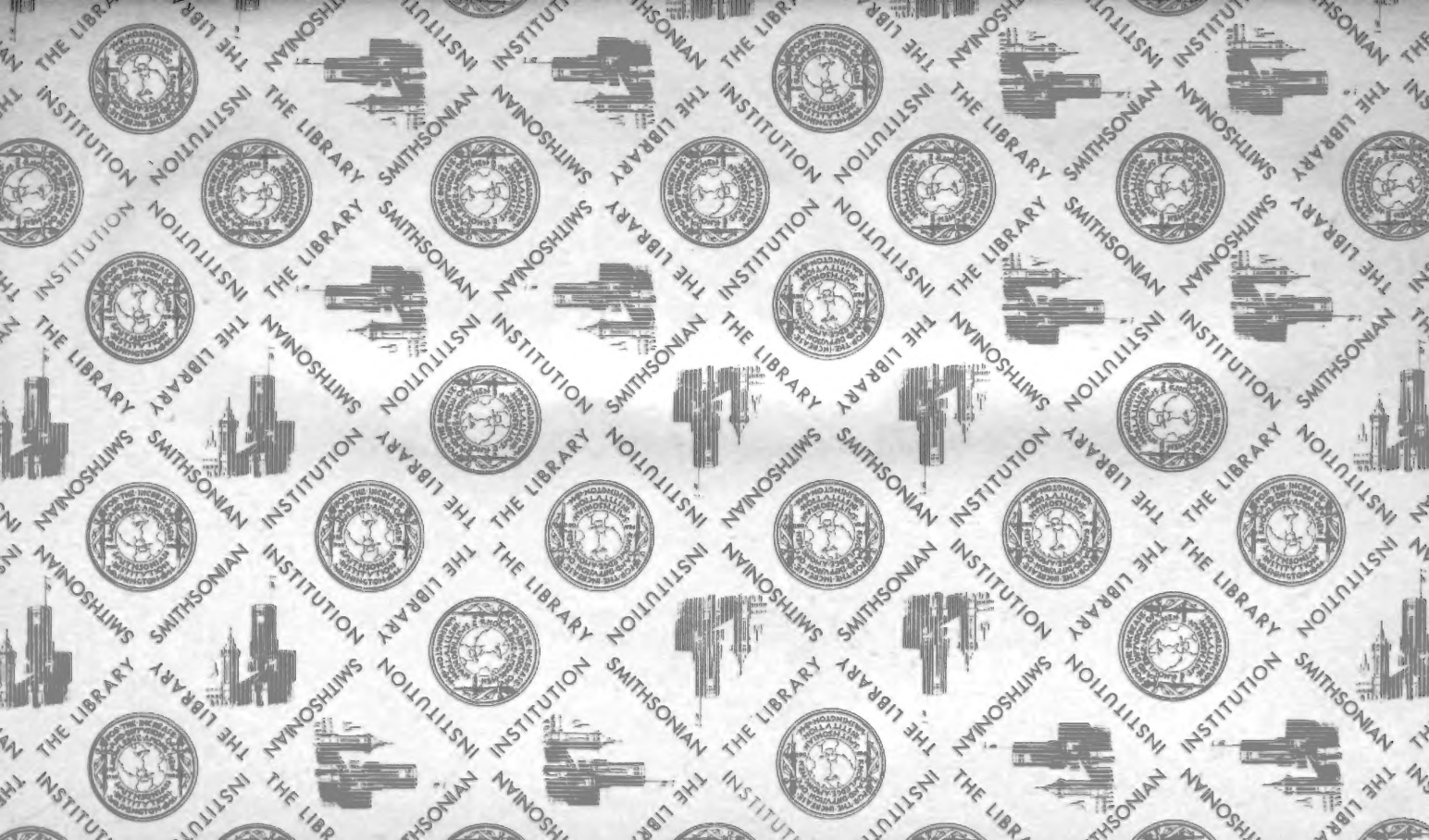

SMITHSONIAN INSTITUTION
THE LIBRARY


SMITHSONIAN INSTITUTION
THE LIBRARY

NEWMAN'S ENTOMOLOGIST.

VOLUME VII.

LONDON:

E. NEWMAN, PRINTER, DEVONSHIRE STREET,

BISHOPSGATE.

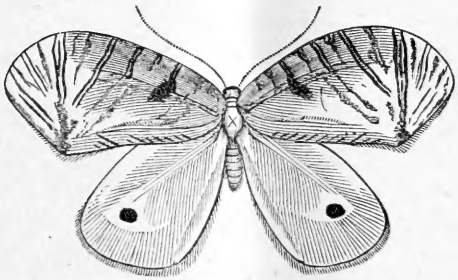
THE

ENTOMOLOGIST

CONDUCTED BY

EDWARD NEWMAN.

VOLUME VII.



PSYCHOPSIS MIMICA.

LONDON:
SIMPKIN, MARSHALL, & CO., STATIONER'S HALL COURT.

1874.

"Observe the INSECT RACE ordained to keep
The lazy Sabbath of a half-year's sleep.
Entombed beneath the filmy web they lie,
And wait the influence of a kinder sky.
When vernal sunbeams pierce their dark retreat
The heaving tomb distends with vital heat;
The full-formed brood, impatient of their cell,
Start from their trance, and burst their silken shell;
Trembling awhile they stand, and scarcely dare
To launch at once upon the untried air.
At length assured, they catch the favouring gale,
And leave their sordid spoils and high in æther sail."

MRS. BARBAULD.

"Even in favour of the mere butterfly-hunter—he who has no higher aim than that of collecting a picture of Lepidoptera, and is attached to insects solely by their beauty or singularity—it would not be difficult to say much. Can it be necessary to declaim on the superiority of a people, amongst whom intellectual pleasures, however trifling, are preferred to mere animal gratifications? Is it a thing to be lamented that some of the Spitalfields weavers occupy their leisure hours in searching for the Adonis butterfly, instead of spending them in playing at skittles or in an alehouse? Or is there, in truth, anything more to be wished than that the cutlers of Sheffield were accustomed thus to employ their *Saint Mondays;* and to recreate themselves, after a hard day's work, by breathing the pure air of their surrounding hills while in pursuit of this, their 'untaxed and undisputed game'?"—KIRBY AND SPENCE.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

ALPHABETICAL LIST OF SUBJECTS.

*** *It is intended in future to publish the Alphabetical Lists of Contributors and Subjects annually, instead of biennially as heretofore.*

THE ENTOMOLOGIST.

No. 125.] JANUARY, MDCCCLXXIV. [PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.' By Miss ANNA WEISE.

[Mr. Walker has most kindly consented to add, under each description, such remarks on the parasites of the gall-maker, or the inquilines of the gall, as may have come under his own notice; these will be accompanied by any observations that may tend to illustrate the subject and render it more complete, such additions being always signed with his name. I may also say that in the course of this translation it may frequently be convenient to intersperse, in the form of footnote or otherwise, certain allusions to, or illustrations of, a theory of my own, *namely*, that under no circumstances are these oak-galls new or independent parts or organs of the oak; that when we see an object, such as an oak-apple, which we have been taught to suppose a new part or organ, *additional* to the stems, leaves, buds, flowers, stipules, hairs, &c., described by botanists, we are not to conclude it is thus new or additional, but rather to regard it as a form or phase of one of these, caused by the presence or by the prior action of an insect, in some manner or by some process not yet ascertained, and concerning which it would be useless for an entomologist to speculate, seeing it is rather the province of the chemist to conduct such researches. This theory, if so it may be called (perhaps hypothesis were the better word), has not been generally accepted, but on the contrary, has been rigorously and most ably controverted by naturalists who have given great attention to the subject of oak-galls: among others, I may mention Mr. Peter Inchbald, whose arguments in the 'Field' newspaper cannot fail to interest every entomologist, although they were subsequently disputed by Mr. Parfitt, of Exeter, in the same newspaper. The discussion in this instance was confined to the *pseudo-balani*, or false acorns, familiarly

known as Devonshire or woody galls of the oak; but the hypothesis comprehends all known galls. On the other hand, Mr. W. F. Bassett, of Waterbury, Connecticut, U.S., has concluded that certain American galls, the development of which he had watched from the earliest stage, "were only a modified leaf-stem and blade, and that the tuft of long woolly hairs which terminates the cell is only the enormous development of the leaf's pubescence." (See Entom. vi. 552.) The late lamented Mr. J. B. Walsh opposed this idea, and there never has been an entomologist whose opinion is entitled to greater respect. Therefore, although fully convinced of the soundness of my position, I am very desirous it should receive the most searching investigation. These additions will always be signed with my own name.—*Edward Newman.*]

I. Root-galls.

The two kinds of root-galls with which we are acquainted, being invariably covered with earth, we rarely enjoy the opportunity of examining them.—*G. L. Mayr.*

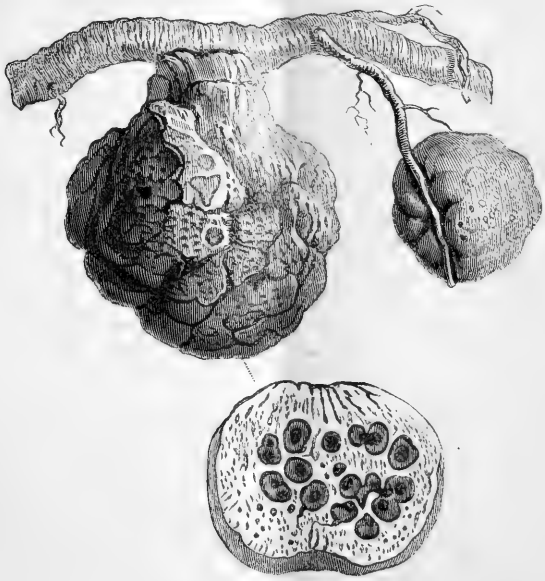


Fig. 1.—Aphilothrix Radicis.

Aphilothrix Radicis.—The gall produced by this species is found on the roots of old oak-trees, near their junction with the trunk, and is generally sparingly covered with earth: in form it is almost spherical, but the surface is irregular, and not unlike that of a potato; in size the specimens differ greatly, some being as small as a walnut, while others are as large as a man's fist; externally it is very rough, and of a dark brown colour; the interior is hard and woody, and contains a considerable number of oval larva-cells. The imago appears in April.—*G. L. Mayr.*

Aphilothrix Radicis, which has not been found in England, is attended in the gall by Synergus incrassatus, one of the inquiline Cynipidæ, or lodgers, whose presence in the galls is not in accordance with the welfare of the first inhabitants.—*Francis Walker.*

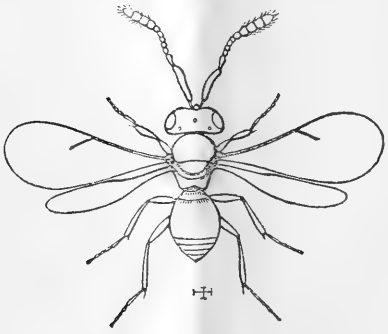
Fig. 2.—Biorhiza aptera.

Biorhiza aptera.—This species occurs on rootlets, which vary in size from the quill of a raven to that of a goose, and seems only to be found on oak-trees that have been uprooted. It rarely occurs singly, and when this is the case it varies in size from a pea to a cherry; generally several are clustered together in one spot on the root, in which case all of them are flattened where they press

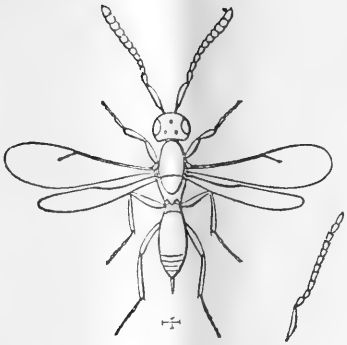
against each other (as is also the case in Cynips Terricola), forming altogether a brown mass, on the extreme of which the outline of each separate gall is readily to be perceived. When recent this gall is said to be succulent, but when dry its section exhibits a reddish mass of cells, divided from each other by their septa. Harting states these galls have but one cell, but on investigation I find that the smaller or pea-sized specimens possess from one to three cells, and the larger or cherry-sized galls from three to five, or in some instances as many as nine; these larger cells are oval, measurrng seven millemetres in their longest, by six millemetres in their shortest, diameter, and are enclosed in a pale yellow, soft ish, thinly-walled capsule, which is throughout firmly united with the substance of the gall.—*G. L. Mayr.*

The existence of Biorhiza aptera, whose gall has been often found on the roots of oak-trees in the south of England, is liable to be shortened by the introduction of the germ of a new life within it, as it is not secure from Callimome Roboris, one of the gorgeous Chalcidiæ, or metallic-coloured flies, of which much must be said afterwards.—*Francis Walker.*

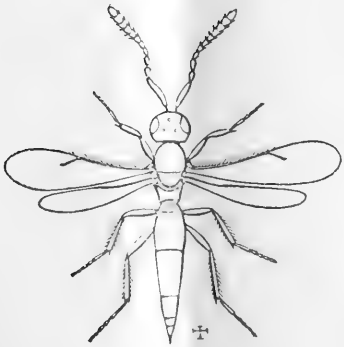
Notes on the Oxyura.—Family 2. *Scelionidæ.*
By Francis Walker, Esq.



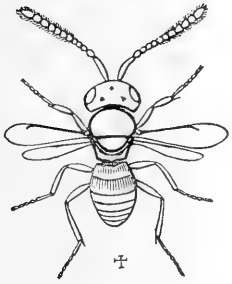
Telenomus brachialis.



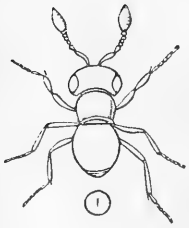
TELENOMUS LARICIS.



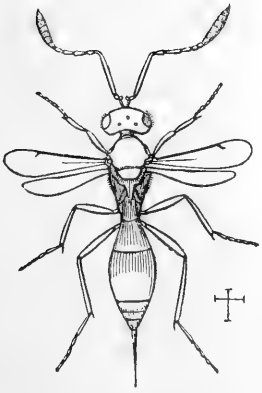
TELENOMUS OTHUS.



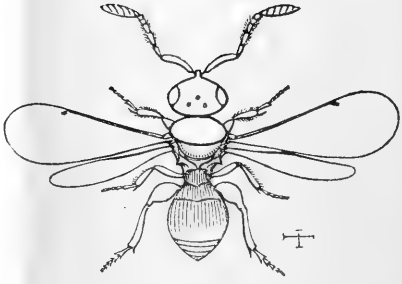
GRYON MISELLUS.



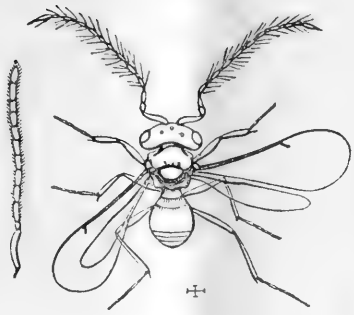
BŒUS SEMINCLUM.



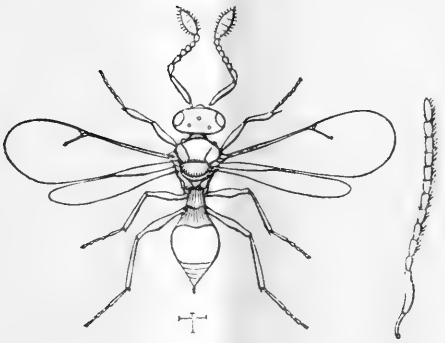
PROSACANTHA VARICORNIS.



TELEAS CLAVICORNIS.



XENOMERUS ERGENNA.



THORON FORNICATUS.

IN anticipation of preparing some notes on the distribution and characters of the generally parasitic Hymenoptera, the translation of the classification of the families, which are distinguished by their comparatively small size and simple structure, is here continued. The Ichneumonids, Braconids, Cynipids, are deferred, and a Synopsis of the European genera of Chalcids has appeared in the "Notes

on Chalcidiæ." The remaining families, of which the Mymaridæ and Platygasteridæ have already been noticed, are interesting on account of their indicating various beginnings of the Hymenopterous race, and from their being individually and collectively, as it were, a life set above a life, or being part of a double existence going on in a single outer form, the increase of one being by the decrease of the other, exhibiting or suggesting the same process in continually higher degrees. The Scelionidæ are nearly allied to the Platygasteridæ, but excel them and the Mymaridæ in the development of the wings, of which the vein or bone has much resemblance to that of the Chalcidiæ; they are also distinguished from the Platygasteridæ by the structure of the antennæ, and have a greater variety in size and in form. The little Telenomi are parasitic on eggs of Lepidoptera and of Hemiptera, and the more diminutive Bæus occurs on windows, where Mymaridæ may often be secured by means of a brush and a bottle. Thoron may be found on banks of ponds, and occasionally take to the water. Scelio and Sparasion are widely different from the two preceding genera. The Ceraphronidæ are also in some of their forms of very minute size; one kind may be considered as an injurious insect, being, like Asaphes and Coryna, a devourer of the beneficial Aphidii. There do not appear to be any links between them and the other families. The slow movements of the Diapridæ are very unlike the quickness in running or in jumping of the two preceding families; the males are distinguished by their elegant antennæ, and the species, like the Belytidæ, dwell chiefly in woods, where they are parasites on wood-eating or on fungus-eating Coleoptera or Diptera. Platymischus inhabits the sea-shore, where it is of frequent occurrence in the South and West of England, and is probably parasitic on some sea-weed insect. In the Belytidæ and in the Proctotrupidæ the fly begins to rise above the more rudimentary structure, which distinguishes the preceding families. A Proctotrupes has been observed to be parasitic on Orchesia micans and on Lithobius. The Heloridæ, like the Proctotrupidæ, indicate a passage to the higher tribes, but there is no occasion here to mention particulars of this transition. In the Embolemidæ there is a still nearer approach to aculeate Hymenoptera, which include part of the Bethylidæ.

SCELIONIDÆ.

A. Club of the antennæ not jointed.
a. Wings developed. - - - THORON.
b. Wings none or rudimentary.
* No scutellum. - - - - BÆUS.
** Scutellum developed. - - - ACOLUS.
B. Club of the antennæ jointed.
a. Subcostal vein shortened, not joining the costa. - - - - - BÆONEURA.
b. Subcostal vein not shortened, joining the costa.
* Marginal branch very long, at least four or five times as long as the stigmatic branch.
† Scutum with two sharply-defined complete furrows. Antennæ of the male long, verticillate; of the female clavate. - XENOMERUS.
†† Scutum without such furrows. Antennæ of the male not verticillate.
‡ Hind tarsi thick. Middle tibiæ with feeble spines. - - - - - TELEAS.
‡‡ Hind tarsi not thick. Middle tibiæ without spines. - - - - - PROSACANTHA.
** Marginal branch very short, mostly shorter than the stigmatic branch.
† First abdominal segment narrow.
‡ Second abdominal segment the largest. - TELENOMUS.
‡‡ Third abdominal segment the largest.
§ Furrows of the parapsides very distinct. Wings with no postmarginal branch. ANTERIS.
§§ Furrows of the parapsides not apparent. Wings with a long postmarginal branch. - BARYCONUS.
†† First abdominal segment broad.
‡ Front with a sharply-defined border. - SPARASION.
‡‡ Front with no such border.
§ Postmarginal branch much developed, longer than the stigmatic branch.
× Postscutellum with some spines. - - TRIMORUS.
×× Postscutellum with no spine.
Λ Antennæ filiform in the female. - - APEGUS.
ΛΛ Antennæ clavate in the female, filiform in the male.
⊣ Marginal branch punctiform. Last joint of the club of the antennæ twice as long as the preceding joint. - - GRYON.

-+-+ Marginal branch half as long as the shaft of the stigmatic branch. Last joint of the club of the antennæ little longer than the preceding joint. Body short, contracted. HADRONOTUS.

§§ Postmarginal branch wanting, or shorter than the stigmatic branch.

× Postmarginal branch wholly wanting. - SCELIO.

×× Postmarginal branch much shorter than the stigmatic branch. - - - IDRIS.

SPARASION.

A. Flagellum of the antennæ with horizontal hairs. - - - - - frontale, *Latr.*

B. Flagellum with hairs not horizontal.

a. Head slight. Mesothorax æneous-green. - ænescens, *Foerst.*

b. Head and mesothorax black. - - lepidum, *Foerst.*

The genus Trimorus is established on Gryon Nanna and on G. Phlias; Apegus leptocerus is mentioned as the type of the genus Apegus, but no description is given. In like manner Hadronotus laticeps and H. stygirus are merely mentioned as the representatives of that genus, but are not described. A short description is given of Scelio fulvipes, found near Aachen; Idris flavicornis is cited as the only species of that genus, but is not described.

FRANCIS WALKER.

A List of Macro-Lepidoptera taken in Alderney.

By. W. A. LUFF.

THE following, with one or two exceptions, were taken from the 23rd to the 30th of June, 1873:—

Melitæa Cinxia.—Rather plentiful, but only in one locality, in a valley on the west coast of the island; they had, however, been out some time, and were nearly all much worn.

Vanessa Urticæ.—Saw one specimen.

Pyrameis Atalanta.—Plenty of hybernated specimens.

P. Cardui.—One.

Pyrarga Megæra.—Two specimens, one with a bipupilled eye-spot. I may here say that this variety is not at all uncommon in Guernsey and Sark.

Epinephele Janira.—Extremely abundant.

Polyommatus Phlæas.—Not uncommon.

Lycæna Icarus.—By far the most abundant species.

Colias Edusa.—One specimen, sent me in 1868 from Alderney.

Pieris Rapæ.—Very common.

P. Brassicæ.—Saw only two.

Acherontia Atropos.—I have no doubt that this insect is common, as I had a good description of the larva from one of the natives.

Sphinx Convolvuli.—Received a specimen from Alderney in 1868.

Macroglossa Stellatarum.—Two.

Euchelia Jacobææ.—Not uncommon; the food-plant, Senecio vulgaris, very abundant.

Chelonia caja.—Seems commoner than in Guernsey; I took four specimens.

C. villica.—One.

Arctia fuliginosa.—Not uncommon.

A. lubricipeda.—Very common.

A. Menthastri.—Took several.

Liparis auriflua.—One larva feeding on hawthorn.

Bombyx Trifolii.—Found the larvæ pretty common all around the coast, but they were most abundant close to Fort Touraille; there I took fifty specimens in about two hours: they were feeding on a coarse, wiry grass growing amongst the sand.

Rumia cratægata.—Took two or three.

Acidalia subsericeata.—Several on the west coast.

Aspilates citraria.—Not uncommon, but of no use as specimens, being too much worn.

Abraxas grossulariata.—Pupæ abundant on gooseberry and currant bushes.

Emmelesia decolorata.—Not uncommon.

Melanippe ocellata.—One.

Camptogramma bilineata.—Extremely abundant.

Cidaria russata.—Not uncommon.

Pelurga comitata.—One fine specimen.

Xylophasia polyodon.—Several at sugar.

Mamestra Brassicæ.—Larvæ abundant.

Apamea oculea.—One.

Miana strigilis.—Two at sugar.

Agrotis Segetum.—One.

Tryphæna pronuba.—Two at light.

Dianthœcia conspersa.—Found several young Dianthœcia larvæ feeding in the seed-pods of ragged robin (Lychnis Flos-Cuculi), which I suppose were Conspersa, but I did not succeed in rearing them.

Phlogophora meticulosa.—One or two at sugar.

Euplexia lucipara.—Not uncommon.

Cucullia umbratica.—Several resting on stones and gate-posts.

Plusia Gamma.—Extremely abundant.

The above list shows a total absence of many of the commonest British Lepidoptera on the wing in June. The island is so exposed, and almost devoid of hedges and trees, that I was almost surprised to find so many species. The nearest point of France, Cape La Hogue, is only ten miles distant, so that rare species would be not unlikely to occur if the island was searched at all times of the year.

W. A. Luff.

Guernsey.

Three Notes on Aphides. By Francis Walker, Esq.

1. *Aphides of Amurland.*—There are only two species of the Aphis tribe to record from Amurland, but they are both of interest on account of their distribution elsewhere. The first is Lachnus Piceæ, known as one of the most northern insects observed, and of frequent occurrence among the snows and glaciers of Switzerland: it appears occasionally and irregularly near London, but has not been often observed in England. The second is Dryobius croaticus, a native of Italy and of Croatia, and closely allied to D. Roboris, which is a native of more Northern Europe, and some may suppose that the difference between the two, and the more darkened wings of the former, is the effect of a difference of climate.

2. *Yearly Close of Aphis-life in the Fall.*—October is the egg-laying season of Lachnus Piceæ, and of very many other kinds of the Aphis tribe, and at this epoch there is a great gathering of Aphides to the spots which witnessed in the

spring their exclusion from the egg state. Many-coloured leaves are continually falling, or are wafted by the breeze, and are freighted with more or less limited companies of Aphides, which they convey peacefully to the earth, to mingle there with dust. Their futurity is secured in the egg, and the quiet close of their yearly life differs much from the summer period. They are not now destroyed by outward nor by inward enemies, and are free from the officious over-running of the ants, when the latter remark their growing, but transitory, abundance, and calculate on a proportionate supply of honey.

3. *Aphis-honey.*—Bees find their honey comparatively prepared for them in flowers, but the honey by the medium of Aphides has various beginnings, and analysis may show whether it has a difference in quality by the difference in its origin. It is extracted from the crevices of old oak trees, from the twigs of young oak trees, from the roots of grass, of sow-thistles and of parsneps, from the nettle and the bramble, from the ivy and the honeysuckle, from the willow and the poplar, from the bog-myrtle and the sea-aster, and its sweetness has abundance of other sources.

FRANCIS WALKER.

Entomological Notes, Captures, &c.

Cause of Shrivelling of Wings of Lepidoptera.—Will some of your correspondents assign a satisfactory reason for the shrivelling of the wings of Lepidoptera? There are doubtless several causes to which this imperfection can be traced. Amongst others is the scarcity of provisions when the larvæ are about to be full fed, which will no doubt lead to this. When the feeding-house contains many larvæ of the larger sorts it is really difficult to provide them with sufficient provender; and though you may supply them over-night with what you consider to be "a heavy feed," in the morning when you approach the breeding-cage, to your surprise, you find it contains nothing but sticks and stalks, and hungry animals. It requires an old hand to be able to cater properly for creatures with such enormous appetites, and if the quantity of food is insufficient the result will be shrivelled-winged

imagos. But this is not always the reason for this malformation. This season I had two larvæ of Liparis dispar, which were confined in a large, wide-mouthed glass with a muslin cover, and which were abundantly fed, their food being the large leaves of the plum, and their number so small there was no difficulty about it, and they spun up in the midst of plenty on the 21st and 24th of July. The imagos appeared on the 15th of August; both females, with shrivelled wings. Should the pupa be enclosed in a glass or box which is not sufficiently large to give the imago ample room to expand, the same shrivelling will occur; but in this case, neither a want of space nor a scarcity of food could have been the cause.—*Owen Wilson; Cwmffrwd, Carmarthen, August* 16, 1873.

Insect Congeries.—Many species of insects are known to occur occasionally in vast swarms, and our entomological periodicals contain several records of facts of this description. In the "nest-room" at the British Museum may be seen a cluster of the Dipterous fly Atherix Ibis, concerning which Walker's 'Diptera' contains the following note:—"The female of this fly is gregarious, and attaches its eggs in large clusters to boughs hanging over streams, and there remains, and shortly dies. The cluster is generally pear-shaped, and sometimes contains many thousands of dead flies, and continually receives accessions by new comers settling upon it." Similar masses have since been found of even larger size, and they are probably not uncommon. I have a vivid recollection of seeing small heaps of dead bodies of winged ants on the roof of the great tower of the Abbey Church of St. Alban's, in September, 1870; and a like swarm gave rise to an alarm of fire at Cobourg in 1865,—noticed in the daily papers at the time: smoke was apparently seen issuing from the spire of the cathedral; a scaffolding was hastily erected, and a man sent up with buckets of water to check the impending conflagration. It was then discovered that an immense congregation of winged ants flying around the tower was the sole cause of the alarming phenomenon. Everyone recollects the service the myriads of Syrphidæ and Coccinellæ rendered to penny-a-liners in search of a subject on which to exercise their florid pens during the "silly season" a few years back; and many kinds of Aphides and Thrips are oftimes equally anxious to achieve notoriety by the mere force of numbers.

As a contribution to this subject I beg to put on record an incident which my brother and I witnessed during an afternoon's ramble at the latter end of August last. We were "prospecting" in a favourite nook of ours in Epping Forest, near the village of Woodford, when we chanced upon an astonishing sight: a patch of fern and broom, about four yards square, was literally blackened by a swarm of a little fly, Sepsis cynipsea, *L.*; every frond and twig seemed alive with the myriads of insects, slowly moving about and gently fanning their beautiful, spotted, iridescent wings with a steady and simultaneous motion. Some idea of their prodigious numbers may be formed when I mention that two or three sweeps of a butterfly-net secured a mass of flies which weighed more than half a pound! We noticed that the mass exhaled a rather strong, and by no means an unpleasant, odour of "lemon-thyme." The swarm consisted of males and females; but a long examination of the spot failed to throw any light on the cause of this assembly. The larvæ, Mr. Walker informs me (I am indebted to him for the name of the insect), feed on decaying matter, but we could find no difference in this respect in the small patch of herbage covered with the insects, or the ground beneath them, compared with the surrounding open forest glade. Mr. Walker once found a large cluster on a statue in Highgate Cemetery. I shall be glad if this notice leads to the publication of similar facts, for a rational explanation of this class of phenomena, based on observation, would certainly be welcomed by all lovers of Nature.—*Wm. Cole; The Common, Stoke Newington, N.*

Certain Insects emerge from the Pupa by Hydraulic Pressure.—Being only a beginner and having seen nothing in any work I have read on the emergence of insects from the pupa, but that they "wriggle out," I was surprised and delighted when I saw the wonderful power at their command to effect their deliverance. On the 14th of July last, as I sat watching some Bembeciformis dry themselves after their birth on the stem of an old willow, I took in my fingers a pupa that had just come to the mouth of its tunnel, and holding it between my eye and the light, being in a gloomy part of a wood at the time, I saw that the anal segment of the case was empty, and the enclosed insect emitting several drops of fluid

till this space was full, when the case burst in the usual place, and the insect walked out; there was no wriggling or contortion during the operation. I had frequently observed this fluid in the recent cases, but had no idea of the use the insect had made of it in expelling itself from its envelope by its means. Readers acquainted with the pressure of fluids will understand the comparatively immense power an insect may have in this way. As I had several hundred pupæ of Bembeciformis and Typhæ I had frequent opportunity of observing the process, and these moths emerge at a convenient time, from eight to twelve o'clock a.m., for observation. I also remarked that when the pupæ of Typhæ were removed from the support of the stem of the food-plant the abdominal segments of the case were forced off, the anterior remaining on the insect, but when supported this did not happen.—*William Talbot; Tarbert, Limerick.*

In the matter of Lathonia, Leucophæa, and Albipuncta (Entom. vi. 563).—I have sent you the dates and localities of the three above-named insects, all taken within fourteen miles of Canterbury, as I see by the December number of the 'Entomologist' many specimens of the above-named insects, in fact the majority of those sold as British were nothing but continental, and the three insects named I have no hesitation in saying have their head-quarters in this locality. The first-named I took the first year I collected, which is about seventeen or eighteen years ago, when my father, brother and myself took nineteen, all of which Mr. Cooke, of New Oxford Street, had alive, as he was collecting in this locality. I did not see it again until 1868, when I took thirteen. Since then I have taken it every year, and believe I shall continue to do so. As to Pachetra leucophæa, the first I ever saw was taken by myself on June 13th, 1872, which was a female, and not knowing the insect I forwarded it alive to Mr. Stevens, who named it for me. I then worked hard to find more, and tried the next night, when I only found one poor specimen, which was flying at the top of the long grass. I then tried sugar, and the first time I sugared, which was a Saturday night, I took twenty-three, out of which there were only four bad specimens; the others were as good as bred. I sent an old one alive to Mr. Bond, also a second to Mr. Newman. I also took two on the 19th and one on the 21st. All the above I

took in about eight days. This year I have not taken so many: although I have worked very hard for them I have only taken twenty, and about one-half of these were bad specimens; the females are almost sure to be good. No one could be taken in with continental specimens of P. leucophæa, as they differ from ours as much as though they were two distinct species: our specimens are very pale, being almost white; the marks are quite white, especially along the hind margin of the wings; whereas the foreign specimens are larger and very much darker in colour, even on the under side. I will now mention Nonagria albipuncta, the third specimen known, which I took in a pine wood, August 12th, 1869, and sent alive to Dr. Harper, of Hyde Park; on the 16th I took one; on the 17th, one; on the 19th, three. I also sent one or two of the others off alive. In 1870 I took eleven fine specimens in our Blean, Hospital, and Pine Woods; in 1871, a collector, named Edney, and I took upwards of twenty, mostly fine; in 1872, only nine specimens; and in 1873, only five specimens between two of us. I may add that had we worked well we could have taken upwards of a hundred in 1871. In conclusion, if any private gentleman is in want of the above-named three species, I shall be but too happy to take him to my hunting-ground, where I can promise he shall take them himself.—*G. Parry; Church Street, St. Paul's, Canterbury, December* 1, 1873.

D. conspersa and D. compta (Entom. vi. 518, 546, 564).—In reply to Mr. Meek's singularly inaccurate and illogical paper, permit me to answer him categorically. First, then, I never asked if D. compta was British. I wished that some one would place so-called British (Irish ?) specimens (?) in a relaxing-box, &c., and never showed him a Dianthœcia compta, or said I took one on the Big Hill of Howth, in Wales, or elsewhere; *he and others* called my Penmaenbach *var.* of Conspersa, Compta; *not I;* and I am quite sure no amount of placing it in a damp box will ever make it Compta. I think your readers perfectly understand what he pretends puzzles him, hence I need not pursue that phantom, but proceed at once to show that Mr. Warrington cannot help me much. He (Mr. Warrington) says, in reply to my question: —"I have seen the remarks about Compta and Conspersa in the 'Entomologist.' I recollect picking out Conspersa in

your collection as most like the one I took in Ireland, named Compta; but, as I said before, I do not know Compta so well as to distinguish the difference, so I took Mr. Meek's word for it: it was the latter end of July when I took it." But he says nothing of having seen Mr. Meek take one. How logical Mr. Meek is, when he says he spent night after night looking for *one species* and did not take *another species*, I need not comment upon, merely observing D. Cæsia *var.* Manani appears as a fleeting blue speck, gliding more like a Sphinx from flower to flower, and frequenting those Silene plants which grow nearest to high-water mark on the coast, whilst D. Barrettii appears as a spinning dark Plusia Gamma-like flying moth, and frequents those plants of Silene and honeysuckle which grow at a considerable elevation up the banks and grassy slopes. And last, I do not remember telling anybody "Sesia Philanthiformis was common at Howth."* I did not want that species when I was there, else I should have gone more on the southern end of Howth, amongst the almost inaccessible cliffs, not on grassy banks, where D. Barrettii is most abundant, and where there is only one small patch of rock which could supply the peculiarly stunted plants of sea-pink within range of the splash of the tidal spray, which this species seems to affect most. Even at Onchan, Isle of Man, Mr. Meek might have noticed that he only found the pupa of Philanthiformis within a zone of a few feet wide, and in June, not July, and that zone within a few feet of high-water mark; at any rate, I directed him so to search for it there. I am quite aware one person may take a species and others fail to find it, but there are species I should not expect to find under certain circumstances, for example,—Mr. Meek wrote me several letters (now before me) from the "Manx Arms," Onchan, Isle of Man, in June, 1871, asking me to come and show him how to find the larvæ of Polia nigrocincta, he having failed to find it in its very best time (first two weeks in June), and said he had taken a new Bombyx. When I got there Mr. Warrington had sold him

* [Possibly the following is the passage to which Mr. Meek referred:—"*Additions to Mr. Birchall's List of the Lepidoptera of Ireland.*—Sesia Philanthiformis freely on the coast of Howth, from the baths to the Round Tower in Dublin Bay, where the sea-pink (*Statice Armeria*) grows upon the rocks. June and July.—*C. S. Gregson; Stanley, Liverpool.*" '*Entomologist's Monthly Magazine*,' vol. iv. p. 70.—*Edward Newman.*]

several Nigrocincta larvæ at three shillings each. I met him on the rocks, and took eighteen larvæ that night, and think he took about the same number, as we worked close together. Afterwards he showed me three of his new Bombyx on the sets, asking me what they were. I said, "Gluphisia crenata, certain." Next day he observed, "Well, you see they are bred here and on the sets, but I should have liked you to have seen them alive." I remarked, "I did not doubt their being *bred* here; the question is, Were they *fed* here?" Now, as I do not know a single plant of their reputed food growing near Onchan, I think I may fairly be excused if I refuse to go searching for it there. But to return to D. compta. Now we know how many specimens are reported from Howth, I think I am more justified than ever in asking that the so-called (Irish) Compta, which have so freely been moving about amongst buying collectors of Lepidoptera, should be tested; but another reason is also patent. Polia nigrocincta is also being offered for sale, and being sold freely. Now, as Mr. Meek has had *all* the *Manx* specimens of this species which have been sold, with one or two exceptions, up to this year, so the numerous specimens being sold cannot be, and, so far as those of them which have been submitted to me for identification go, are not Manx, or like Manx, specimens: they are the common suffused German form of this species, not the variety called Statices, in consequence of its differing so very materially in colour and intensity of markings from any form of continental P. nigrocincta I have yet obtained or seen. Three Compta have recently been in Lancashire; but without any desire to depreciate Mr. Meek's success, I feel bound in justice to myself to show there is no truth in his statement, that I said this or did that, as I am sure that the time has quite come when people should cease reiterating that I said so and so, or did so and so, for any purpose.—*C. S. Gregson; Rose Bank, Liverpool, November* 9, 1873.

Dianthœcia Compta (Entom. vi. 563).—Where is Mr. Warrington? I shall feel greatly obliged if he will come forward and state the fact *that he captured Compta with me at Howth*. On referring to my diary I find the following notes:—June 21st, six Barrettii, one Compta; June 23rd, one Compta, seven Barrettii; June 25th, one Compta taken by Warrington, and thirteen Barrettii by myself. Although

I stayed till early in July I did not find any more Compta that season. I shall be very pleased to join any London *gentleman* entomologist next season for a trip to Howth, when no doubt we can settle the "matter of Dianthœcia Compta" for ever. I may add that Compta occurs on the cliff at the bottom of Sir Edward Burrows' grounds, and the paths are beautifully ornamented with fuchsias, sweet-williams, and nasturtiums, also huge patches of sea-pink and Silene maritima, collected from various parts of the coast; every particle of the latter was destroyed by a well-known entomologist about six years ago, much to Sir Edward's annoyance. —*E. G. Meek;* 56, *Brompton Road, S.W.*

British Species alias *Continental* (Entom. vi. 563).—True lovers of the collecting of British insects must hail with pleasure the remarks of our valued friend, Mr. Henry Doubleday, on the authenticity of numerous rare species passing as British, but in reality and without doubt aliens; such a mode in forming a collection of British insects is very damaging to this interesting Science. I, for one, have lost much of the interest I hitherto had, principally from this cause, that there is scarcely any depending on an insect (called rare) from whatever quarter you may receive it.—*F. O. Standish;* 1, *Glendale Villas, King's Road, Cheltenham, December* 1, 1873.

[This controversy must now cease.—*E. Newman.*]

Xanthia aurago and Cirrhœdia xerampelina near Llangollen (Entom. vi. 547, 564).—In the 'Entomologist' for December, 1873, Mr. Gregson records the capture of a specimen of Xanthia aurago at Llangollen, and states that he is not aware of any previous capture of that insect on this side of England or in Wales. It may, therefore, interest him to know that in the year 1865 I found a good, fresh specimen of X. aurago, resting, by day, on the staircase of this house, which is ten miles from Llangollen. I am unable to give the exact date, as I had not then begun to collect with any system. It was one of the first moths I ever captured, but is still in good preservation, though unfortunately set on a common pin. It was not till some years afterwards that, on obtaining your 'British Moths,' I learned the name and value of the species. I may mention that though I have never taken another Aurago, my

sisters and I have, at different times, found Xanthia gilvago and Cirrhœdia xerampelina within the limits of our own garden.—[*Miss*] *Anne Steele Perkins; Ashgrove, Overton, Flintshire, December* 2, 1873.

Xanthia Aurago (Entom. vi. 564).—Permit me to say that I think Mr. Gregson's note scarcely adds to our knowledge of the westerly range of Xanthia Aurago. The insect having long ago been recorded to occur in Ireland, its capture at Llangollen is not remarkable, so far as westerly longitude is concerned.—*Edwin Birchall.*

Hybridizing Smerinthi.—This year I bred out specimens of Smerinthus ocellatus and S. Populi, which I was lucky enough to have crossed, male Populi with female Ocellatus; in about twenty-four hours after she began to deposit her batch of eggs: they were deposited in batches differing in number; they were all unattached; the number deposited was a hundred and seventy, deposited at intervals, and more so after being disturbed. The duration in the egg state was fifteen days; colour at first was bluish, then changed in a few days to a light flesh-colour; the caterpillar fed on apple-leaves. After feeding for three weeks began to wander from their food, and died with the diarrhœa. If you can throw out a few hints it may be a guide for the future, to myself as well as others, how to treat them if lucky enough to cross. Is this a common occurrence?—*John Williams;* 100, *Well Street, Hanley, Staffordshire, November* 12, 1873.

Description of the Larva of Macrogaster Arundinis.—The following notes on this larva may be useful, as being fuller than those given in your work on 'British Moths.' On May 9th, 1873, I found a single larva of this species inside the stem of a reed, at Wicken Fen. The following description was taken on May 10th:—Bulk slender in proportion to length; head flattened, about half the size of the 2nd segment, and retractile within it; form cylindrical, but tapering towards the extremity; a corneous plate, with ten black spots on the 2nd segment. The larva is covered with a number of warts, emitting some six short hairs on each segment, but more numerous on the last. Spiracles pink, and not easily perceptible. General colour a pale rose. Head dull ochreous; mouth black, with two black spots on each side. Medio-dorsal line conspicuous, being of a darker tint

than the ground colour; subdorsal line broader, interrupted, and of a brownish colour; spiracular line very indistinct. Each segment, excepting the first two, is mottled with two patches of brown, nearly coalescing. The under surface is pinkish white. Hind legs blackish pink. Claspers of a dull white colour. The larva unfortunately did not go into pupa successfully.—*G. H. Raynor; St. John's College, Cambridge, October* 20, 1873.

Liparis auriflua and L. chrysorrhœa.—It may be within your recollection that I raised the question, in the 'Entomologist' of June last, as to whether it was now the habit of L. auriflua to form a common nest in the winter season, since that has become, on the average, so much milder than formerly. I had never myself found any such winter colony, and friends of whom I enquired made the same admission; and also that in autumn, beating for larvæ, they had not found the species feeding gregariously. No reply was sent to your pages, or none that you thought desirable to publish. This month I have seen many of their winter nests, more particularly in the hedges lying towards the marshes below Gravesend, where it is, doubtless, colder in winter than in many places. I have forwarded to you a couple of these colonies for examination. Somehow, I still think it is not the normal habit of L. auriflua thus to congregate; but I may be wrong.—*John R. S. Clifford;* 120, *Windmill Street, Gravesend, October* 10, 1873.

[I think Mr. Clifford's larvæ, which are very small, will turn out to be L. chrysorrhœa.—*Edward Newman.*]

Ptilophora plumigera.—It is very likely that many specimens of Notodonta plumigera have been taken in Hampshire; but as at the time your invaluable 'History of Moths' was written, Buckinghamshire was the only recorded locality, I thought it might be worth while to mention that on the evening of November 20th I took a magnificent specimen from a street-lamp, and at the same time a male Petasia cassinea, also in splendid condition.—*Joseph Anderson, jun.; Alresford, Hants, November* 21, 1873.

Dasycampa rubiginea, Eremobia ochroleuca, and Sphinx Convolvuli, at Christchurch.—On the evening of the 7th of November I caught a fine specimen of Dasycampa rubiginea at ivy-bloom in my own garden. The Rev. A. C. Hervey

informed me that he had caught three specimens of this beautiful Noctua in this neighbourhood last year. I think, therefore, we may fairly claim Christchurch as one of the localities for Rubiginea. I wish also to mention (as I find some reference to Eremobia ochroleuca in the 'Entomologist' for November) that I caught several specimens of this insect on the evenings of the 14th, 18th, and 19th of August last; and in August, 1871, *one flying by day*. On the 3rd of October a boy brought me a live specimen of Sphinx Convolvuli: being a female, and in rather a dilapidated condition, I kept it for a fortnight, in the hope of obtaining some eggs, but I am sorry to say it died without gratifying me.—*W. McRae; Christchurch School, Hants, Nov.* 22, 1873.

Plusia interrogationis near Driffield (Entom. vi. 516).—Like your correspondent, Mr. Robinson, I had the pleasure of taking a very fine specimen of Plusia interrogationis on the 11th July, 1873, over some honeysuckle.—*Geo. R. Dawson; Poundsworth, near Driffield, November* 21, 1873.

Supposed New Cryptocephalus.—In May, 1870, I took, flying in the bright sunshine, in the trench that surrounds the old Roman camp on the summit of St. Catherine's Hill, Winchester, a specimen of a smallish Cryptocephalus, perfectly black, with the exception of a small yellowish spot at the extremity of each elytron. Mr. F. Smith, of the British Museum, referred this to a variety of C. Moræi, from which, however, it differs by its much larger size, being nearly half as big again as that species. Mr. E. W. Janson, however, thinks that it must be Cryptocephalus lineola, with specimens of which it certainly agrees better than with C. Moræi. Lineola is, I believe, almost exclusively a northern species, so that its occurrence in such a southern locality as Winchester is interesting.—*W. A. Forbes.*

Singular fact: Tenacity of Life in a Specimen of Satyrus Semele.—One day, being very windy, while sojourning on the South coast during the past summer, and for want of better employment, I amused myself in netting a few Satyrus Semele, and in the act of getting one in my cyanide-bottle the head got cut off; as the Semele tried to escape I pill-boxed it, and had it therein alive for four days, occasionally letting it out, and it would fly a short distance. The head, with antennæ, blew out of my net. One would almost ask, Whereabouts was its vitality?—*F. O. Standish;* 402, *High Street, Cheltenham.*

Aphilothrix Globuli, Hart., *a Gall-maker new to Britain.*—I found a gall of this species on oak in Hockley Bull Wood, near here, on the 13th of October. This species is allied to Aphilotrix Gemmæ, *Linn.* (=Fecundatrix, *Hart.*), the maker of the artichoke gall of the oak.—*E. A. Fitch; Down Hall, Rayleigh, Essex, November* 15, 1873.

Correction of Error.—The plant, in the flower-heads of which I find galls produced by Urophora solstitialis, *Linn.*, is not Serratula tinctoria, as I stated (Entom. vi. 142), but the common knapweed (Centaurea nigra).—*Id.*

The South London Entomological Society.—The Second Annual Exhibition of this Society took place at the "Horns" Assembly Rooms, Kennington, on Wednesday, December 10th, and was well attended, notwithstanding a thick fog which prevailed all the evening. The principal exhibitions were:—Lepidoptera, by Mr. Wellman (the President), Mr. Farn, Mr. Allin, Mr. Stevens, and Mr. Williams; Mr. Boden also exhibited some remarkable varieties; Mr. Hoey exhibited several life-histories of great interest. Coleoptera, by Mr. Champion, Mr. Marsh, Mr. Jarvis, Mr. Oldham, and Mr. Bull. Neuroptera, by Mr. M'Lachlan. Hymenoptera, by Mr. Hoey. Diptera, by Mr. Verrall. Exotic Lepidoptera, by Mr. Janson.—*Edward Newman.*

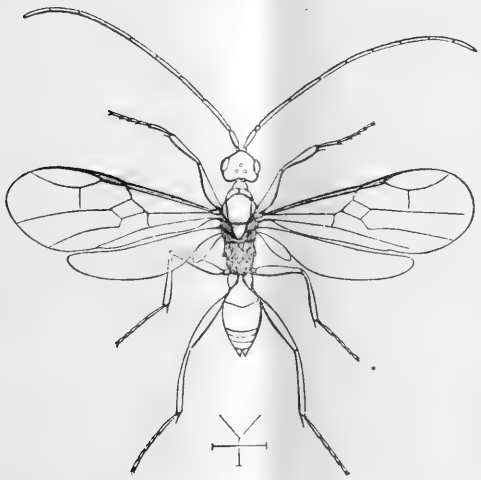
Haggerston Entomological Society.—The Sixth Annual Exhibition of this Society took place at their Rooms, 10, Brownlow Street, Dalston, on the 13th of November. Among the most interesting objects were a striking variety of Galathea, exhibited by Mr. Stevens; very fine varieties of Nupta and a black Grossulariata, by Mr. Eedle; and a black variety of Paphia, by Mr. Moore.—*Id.*

Melitæa Artemis.—A Plate, on steel, with four coloured figures of the English, Irish and Scotch forms of Melitæa Artemis, illustrating Mr. Birchall's paper in the December 'Entomologist's Magazine,' may be obtained on application to the Author, Kirkstall Grove, near Leeds, price one shilling, post free. Fig. 1 represents the English form of Artemis; fig. 2, male and female of the Irish form (*var.* Hibernica); fig. 3, the Scotch form (*var.* Merope).

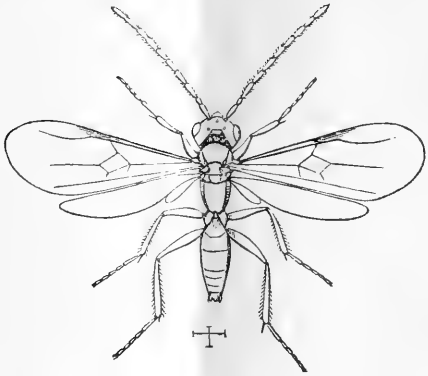
THE ENTOMOLOGIST.

No. 126.] FEBRUARY, MDCCCLXXIV. [PRICE 6d.

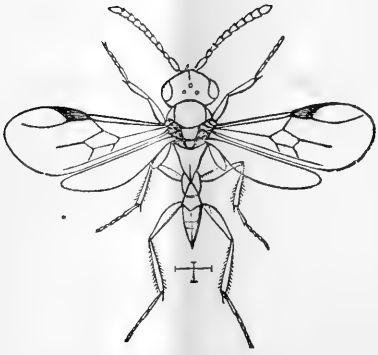
Notes on the Oxyura.—Family 3. *Ceraphronidæ*. 4. *Diapridæ*. 5. *Belytidæ*. 6. *Proctotrupidæ*. 7. *Heloridæ*. 8. *Embolemidæ*. 9. *Bethylidæ*. 10. *Dryinidæ*. By FRANCIS WALKER, Esq.



EMBOLEMUS RUDDII.

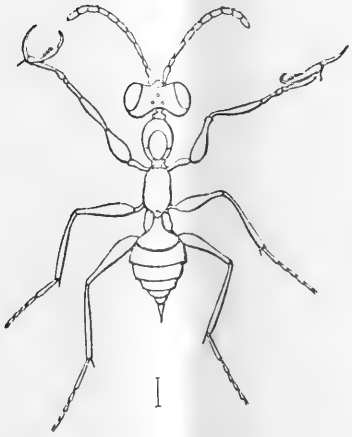


LABEO VITRIPENNIS.

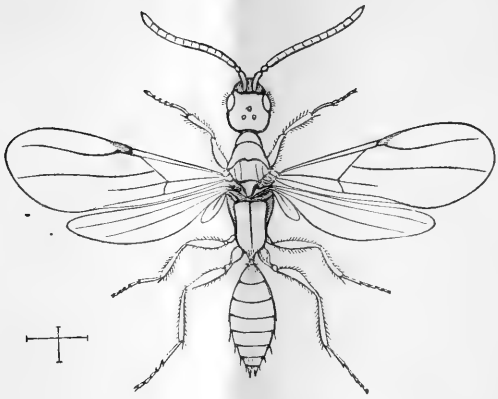


APHELOPUS MELALEUCUS.

CHELOGYNUS DORSALIS.



DICONDYLUS PEDESTRIS.



Epyris niger.

Ceraphronidæ.

A. No ocelli. - - - - - Lagynodes, female.
B. Ocelli conspicuous.
a. Wings without a determinate costal stigma, or merely with a linear one.
* Front between the base of the antenna with a spine. - - - - - Lagynodes, male.
** The same with no spine. - - - Ceraphron.
b. Wings with a broad costal stigma.
* Wings hairless. - - - - Trichosteresis.
** Wings hairy.
† Antennæ of the male serrated. Eyes of the female bare. - - - - Lygocerus.
†† Antennæ of the male filiform. Eyes of the female hairy. - - - - Megaspilus.

The genus Lagynodes was previously named Microps, but Foerster does not recognize the latter name, because it had been already applied to a reptile and to a beetle. The genus Ceraphron of Jurine is not identical with that of Latreille and of Nees, but corresponds with the genus Calliceras of the latter, and the name Calliceras is set aside by Foerster on account of its resemblance to the Dipterous genus Callicera. The genus Megaspilus formerly included the

species which now represent the genera Lygocerus and Trichostoresis, and the type of the latter is Cenaphron clandestinus, *Nees* (= glaber, *Boh.*).

DIAPRIDÆ.

A. Wings notched at the tips. - - - ENTOMACIS.
B. Wings not notched at the tips.
a. First joint of the antennæ very much dilated. PLATYMISCHUS.
b. First joint of the antennæ not very much dilated.
* Front much elongated. First joint of the antennæ distorted in the middle. - - GALESUS.
** Front not much elongated. First joint of the antennæ not distorted.
† Subcostal vein not extending to the costa.
‡ Subcostal vein with a stigmatic branch at the tip. - - - - - ANEURHYNCHUS.
‡‡ Subcostal vein with no stigmatic branch at the tip. - - - - LABOLIPS, fem.
†† Subcostal vein extending to the costa.

Male.

‡ Antennæ 12-jointed. - - - CEPHALONOMIA.
‡‡ Antennæ with thirteen or fourteen joints.
§ Antennæ with thirteen joints.
× First joint of the flagellum hardly half as long as the second. - - - PARAMESIUS.
× First joint of the flagellum as long as the second or longer.
o Second abdominal segment with one or more grooves at the base.
-+ Wings with a costal vein. - - - IDIOTYPA.
-+-+ Wings with no costal vein. - - - HEMILEXIS.
oo Second abdominal segment with no groove at the base. - - - - - SPILOMICRUS.
§§ Antennæ 14-jointed.
× Wings with no basal vein. - - - DIAPRIA.
× × Wings with a basal vein.
o First joint of the flagellum distinctly shorter than the second. - - - - BASALYS.
oo First joint of the flagellum not distinctly shorter than the second. - - - LOXOTROPA.

Female.

‡ Antennæ 12-jointed.
§ Head large and flat. - CEPHALONOMIA.

§§ Head not large and flat.
× Wings with no basal vein.
o Scutum with distinct furrows. - - GLYPTONOTA.
oo Scutum with no furrows. - - - DIAPRIA.
×× Wings with a costal vein.
o Club of the antennæ 5-jointed. Scutum with furrows. - - - - - IDIOTYPA.
oo Club of the antennæ at most 4-jointed. Scutum with no furrows. - - - LOXOTROPA.
‡ Antennæ with thirteen joints.
§ Club of the antennæ with only one joint. - MONELATA.
§§ Club of the antennæ with more joints.
× Abdomen conical, acuminated. - - PARAMESIUS.
×× Abdomen truncated at the tip.
o Wings with no marginal branch. - - HEMILEXIS.
oo Wings with a marginal branch. - - SPILOMICRUS.
‡‡ Antennæ with fourteen joints. - - POLYPEZA.

Of Entomacis, which he describes as closely resembling Encoila (= Cothonaspis), there are three species, which he does not name, and he is quite silent as to the species of the other new genera which he has established.

BELYTIDÆ.

Male.

A. Eyes bare.
a. Scutum without furrows. Incisures of the abdomen very strongly marked. - - - ISMARUS.
b. Scutum with furrows. Incisures of the abdomen not very deep. - - - - PSILOMMA.
B. Eyes hairy.
a. Postscutellum with a stout spine. - - OXYLABIS.
b. Postscutellum with no spine.
* Middle keel of the metathorax divided near the tip. - - - - - - BELYTA.
** Middle keel of the metathorax not divided.
† Radial areolet none, or open.
‡ Stigmatic branch and postmarginal branch so much thickened that the radial areolet is hardly distinct.
§ Basal veins obsolete. . - - - SYNACRA.
§§ Basal veins distinctly emitted. - - - PANTOLYTA.
‡‡ Radial areolet more or less distinctly formed.
§ Fore tibiæ with a tooth or a spine. - - ZYGOTA.

§§ Fore tibiæ with no tooth nor spine. - - ACLISTA.
†† Radial areolet closed.
‡ Petiole of the abdomen not or only slightly longer than the metathorax.
§ Scape with the border at the tip produced, and in some aspects dentate. - - - ACROPIESTA.
§§ Scape with the border at the tip not produced.
× Apical ventral segment straight, grooved. - ANECTATA.
×× Apical ventral segment somewhat curved, not grooved. - - - - - PANTOCLIS.
‡‡ Petiole of the abdomen much longer than, mostly twice as long as, the metathorax.
§ Marginal branch more than twice as long as the radial areolet. - - - - MACROHYNNIS.
§§ Marginal branch not twice as long as the radial areolet.
× Marginal branch as long as or hardly longer than the stigmatic branch, always much shorter than the radial areolet. - - XENOTOMA.
×× Marginal branch much longer than the stigmatic branch, generally as long as the radial areolet.
o Scape as long as the first joint of the flagellum. Second abdominal segment contracted on each side. - - - - LEPTORHAPTUS.
oo Scape longer than the first joint of the flagellum. Second abdominal segment not contracted. - CINETUS.

Female.

A. Eyes bare.
a. Scutum without furrows. Incisures of the abdomen very strongly marked. - . - ISMARUS.
b. Scutum with furrows. Sutures of the abdomen not deep. - - - - - PSILOMMA.
B. Eyes hairy.
a. Antennæ with more than twelve joints.
* Antennæ 14-jointed.
† No ocelli. - - - - - ANOMMATIUM.
†† With ocelli.
‡ Radial areolet hardly distinct. - - - PANTOLYTA.
‡‡ Radial areolet well defined. - - - ANEOTATA.
** Antennæ 15-jointed.
† Postscutellum with a stout spine. - - OXYLABIS.
†† Postscutellum with no spine.

‡ First joint of the flagellum almost as long as all the following joints together. - - DIPHORA.

‡‡ First joint of the flagellum much shorter than all the following joints together.

§ Middle keel of the metathorax forked. - - BELYTA.

§§ Middle keel of the metathorax not forked.

× Third dorsal abdominal segment much longer than the fourth.

o Marginal branch as long as the radial areolet. Last joints of the flagellum more than twice as long as broad. - - - - CINETUS.

oo Marginal branch much shorter than the radial areolet. Last joints of the flagellum not more than twice as long as broad. - . - XENOTOMA.

×× Third dorsal abdominal segment not longer or not much longer than the fourth.

o Dorsum of the abdomen with eight segments.

-+- Radial areolet closed.

× Joints of the flagellum only slightly shortened near the tip. - - - - ZELOTYPA.

+-+-+ Joints of the flagellum much shortened near the tip. - - - - - - PANTOCLIS.

-+-+- Radial areolet open.

+-+ Stigmatic branch and submarginal branch much shortened, the former emerging from a nearly right angle. - - - - - ZYGOTA.

+-+-+ Stigmatic branch and submarginal branch not unusually shortened, the former emerging from a very crooked angle. - - - ACLISTA.

oo Dorsum of the abdomen with less than eight segments.

-+- Dorsum of the abdomen with seven segments. - ACROPIESTA.

-+-+- Dorsum of the abdomen with less than seven segments.

+-+ Marginal branch more than twice as long as the radial areolet; recurrent continuation of radial branch intersecting the basal vein. - -MACROHYNNIS.

+-+-+ Marginal branch shorter, as long as, or a little longer than, the radial areolet; recurrent continuation of radial vein not intersecting the basal vein.

ꝏ Dorsum of the abdomen with three segments; second unusually elongated, almost extending to the tip. Marginal branch distinctly shorter than the radial areolet. - - - MIOTA.

ωω Dorsum of the abdomen with three, very rarely with four, segments; second not unusually elongated. Marginal branch not shorter than the radial areolet. - - - LEPTORHAPTUS.

Of Ismarus Foerster has described three species—Rugulosus, Halidayi and Neesii, the last being a synonym of Belyta unomala, *Nees*. Of Psilomma, Oxylabis, Synacra, Pantolyta, Zygota, Aclista, Acropiesta, Anectata, Pantoclis, Macrohynnis, Xenotoma, Leptorhaptus, Anommatium, Diphora, Zelotypa, and Miota, he mentions no types.

PROCTOTRUPIDÆ.

Foerster makes of the genus Proctotrupes two genera, Proctotrupes and Disogmus, the type of the latter being P. areolator, to which he adds three other species, as follows:—

A. Fourth, fifth and sixth joints of the flagellum dentate.
a. The tooth near the tip of each of these joints.
* First joint of the flagellum distinctly longer than the second. - - - - - discrepator.
** First joint of the flagellum as long as the second. æquator.
b. The tooth in the middle of each of these joints. - areolator.
B. The above joints not dentate. - - - picicornis.

HELORIDÆ.

This family is limited to one genus, Helorus. Of this Foerster observes that he has one species, H. anomalipes, *Panz.*, from the pupa of Hemerobius, and he distinguishes it from the other species, as follows:—

A. Antennæ luteous. - - - - ruficornis, *Foerst.*
B. Antennæ black.
a. Scutum quite scabrous. Legs wholly black. nigripes, *Foerst.*
b. Scutum quite smooth. Tibiæ and tarsi luteous. - - - - anomalipes.

EMBOLEMIDÆ.

A. Eyes convex. Ocelli large. Basal joint of the antennæ shorter than the first joint of the flagellum. Wings complete. - EMBOLEMUS.

B. Eyes quite flat. Ocelli very small. Basal joint of the antennæ much longer than the first joint of the flagellum. Wings rudimentary. - - . - MYRMECOMORPHA.

Myrmecomorpha corresponds with Pedinomma, *Foerst.*, and is an earlier name. I have found the species on which it is founded under a stone near Chepstow.

BETHYLIDÆ.

A. Head without ocelli. - - - - SCLERODERMA.
B. Head with ocelli.
a. Wings without a stigma.
* Wings with a stigmatic branch and a marginal branch. - - - - - BETHYLUS.
** Wings with no marginal nor stigmatic branch.
† Antennæ 13-jointed. - - - - ATELEOPTERUS.
†† Antennæ 12-jointed. - - - - HOLOPEDIUS.
b. Wings with a stigma.
* Basal vein with a diverging branch.
† Antennæ 12-jointed. - - - - PERISEMUS.
†† Antennæ 13-jointed. - - - - GONIOZUS.
** Basal vein with no branch.
† Furrows of the parapsides distinct. Abdominal segments about equally long. - - EPYRIS.
†† Furrows of the parapsides not apparent. Abdominal segments unequally long. - - ISOBRACHIUM.

Foerster changes Scleroderma to Sclerochroa, because the former name was previously used in Botany. Ateleopterus is founded on Bethylus ateleopterus, Perisemus on B. triareolatus, Goniozus on B. clavipennis and on B. fuscipennis, and Isobrachium on B. dichotomus: all these species were previously described by him, and B. dichotomus is a synonym of B. fuscicornis, *Nees* (male), and of B. nigricornis, *Nees* (female). The materials of this family do not agree well together; a connection may be traced between them and the Chrysididæ.

DRYINIDÆ.

A. Vertex much compressed.
a. Winged. - - - - - DRYINUS.
b. Wingless. - - - - - GONATOPUS.
B. Vertex convex, not compressed.

a. Hind head deeply excavated. Vertex and neck separated by a sharp edge. - - - LABEO.
b. Hind head slightly concave. Vertex and neck not parted by a sharp edge.
* Fore tarsi of the female with long claws. Prothorax of the male distinctly visible above, not longer than the mesothorax.
† Fourth joint of the fore tarsi of the female much longer than the third. Prothorax of the male and female as long or nearly as long as the mesothorax. - - - CHELOGYNUS.
†† Fourth joint of the fore tarsi of the female as long as or a little longer than the third. Prothorax of the male and female much shorter than the mesothorax. - - ANTEON.
** Fore tarsi of the female without long claws. Prothorax not visible above, or longer than the mesothorax.
† Prothorax much longer than the mesothorax. Mesothorax with no trace of the furrows. Wings short, spatulate. - - - MYSTROPHORUS.
†† Prothorax not or slightly visible above. Mesothorax wide, with distinct furrows. Wings ample. - - - - - APHELOPUS.

There are no illustrations here of the Ceraphronidæ, Diapridæ, Belytidæ, Proctotrupidæ, and Heloridæ; they are figured in Jurine's 'Nouvelle Méthode.' The Ceraphronidæ come next to the Scelionidæ, and, like them, are distinguished by the sculpture at the base of the abdomen, and by a simple costal vein. The Diapridæ, like the great part of the Platygasteridæ, have no wing-veins, or none beyond the base of the wing. In the Belytidæ and Proctotrupidæ there are indications of an increase of bones in the wing, and this increase is more extensive in the Heloridæ. The Dryinidæ come last, and are distinguished by their rapid movement, and by their mimicry of some of the aculeate Hymenoptera.

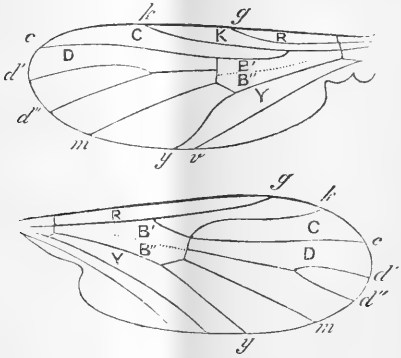
Additional notes on the preceding families, which conclude the series of British Oxyura, are deferred till opportunity occurs of examining in detail the genera and their respective species.

FRANCIS WALKER.

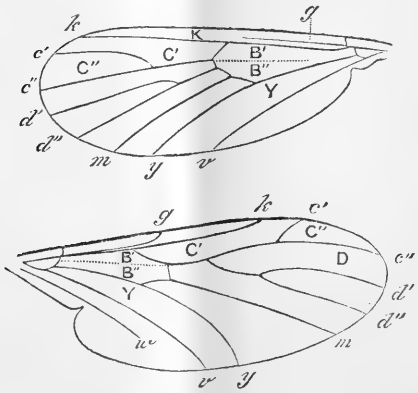
Notes on the Wing-bones of the Two-winged Flies. By Francis Walker, Esq.

Veins.	Areolets.
g Subcostal vein.	R Subcostal areolet.
k Radial vein.	K Radial areolet.
c Cubital vein.	C′ Cubital areolet, 1st.
c′ Cubital vein, 1st branch.	C″ Cubital areolet, 2nd.
c″ Cubital vein, 2nd branch.	B′ Præbrachial areolet.
d′ Præbrachial vein, 1st branch.	B″ Pobrachial areolet.
d″ Præbrachial vein, 2nd branch.	D Subapical areolet.
m Pobrachial vein, 1st branch.	Y Anal areolet.
y Pobrachial vein, 2nd branch.	
v Anal vein.	

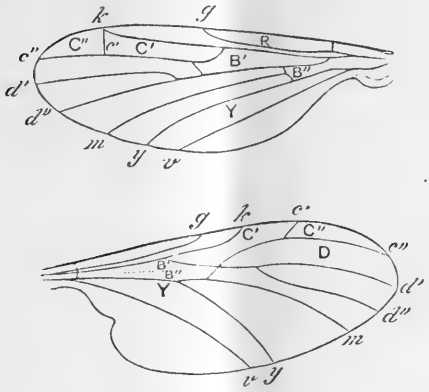
Figs. 1 & 2.—Diadocidia ferruginosa. Mycetobia pallipes.



Figs. 3 & 4.—Ditomyia annulata. Platyura.



Figs. 5 & 6.—Mycetophila. Macrocera.



The above figures, and others which will follow, are from the drawings of A. H. Haliday. The same letter refers to the same parts in all the figures.

One of the chief attractions in noticing the Diptera is the great variety of their manner of flight, and this corresponds with the difference of structure in the wings. These variations will be briefly traced in some notes, which are preceded by the following extract from the MSS. of A. H. Haliday on the same subject.

"The subcostal areolet lies between the costal vein and the first longitudinal vein, usually the mediastinal (but if this vein is effaced, then the subcostal).

"The mediastinal areolet lies next beyond this, between the mediastinal and subcostal veins; and if the mediastinal vein is wanting there is no mediastinal areolet.

"The radial areolet lies between the subcostal and radial veins; if the latter divides into two branches at the end, another radial areolet is enclosed between them; and in either case, if the radial vein is connected with the subcostal by a transverse vein, the radial areolet may be thus divided into more than one. This areolet may become entirely closed without extending to the margin, in case the radial vein rejoins the subcostal before the end, as in Laphria, Volucella, Hirmoneura, and Midas.

"The cubital areolet lies between the radial and cubital veins; if the latter is branched a second cubital areolet is enclosed between its branches, as is ordinary with many families of Diptera, *e.g.* Tabanidæ. In this case, particularly, the cubital and radial veins are not uncommonly joined by a transverse vein, forming a third cubital areolet. When this is the case the direction of the veins may be so modified as to make it doubtful whether the radial or cubital vein be the one that is branched; but analogy to allied genera will generally give a clue, even where the direction of the veins is so far changed as to give the contrary appearance, as in some of the Asilidæ. Rarely the cubital vein also returns to the subcostal, so that the cubital areolets do not extend to the margin; this is the case in Hirmoneura and in Midas.

"Before the præbrachial vein lies the præbrachial areolet, bounded in front by portions of the (subcostal) radial and cubital veins, or some of them, and at the tip by the præbrachial transverse vein. Between the præbrachial and pobrachial veins is the pobrachial areolet, usually bounded at the tip by a more or less evidently oblique or transverse vein (the pobrachial transverse vein), often in connection with a twist or branching of the longitudinal veins. Between the pobrachial and anal veins lies the anal areolet, which is open to the margin when the subanal vein runs on as a continuation of the pobrachial, as in the Tipulidæ generally, and in some other cases, but becomes closed when the subanal vein runs to join the anal; either obliquely, as in Syrphidæ, Conopidæ, Stratiomydæ, Asilidæ, and the neighbouring families in general; or transversely, as in most Muscidæ, many Empidæ, and the Dolichopidæ. These three areolets (the præbrachial, pobrachial, anal), sometimes jointly called the ternate areolets, can in most cases be determined from the manner in which the conjugate axis divides into the three veins,—præbrachial, pobrachial, and anal; and their determination is of prime importance for the determination of the others. A very characteristic areolet, also, when it is present, is the discal, which (generally speaking) lies beyond the præbrachial and pobrachial, commencing in the angle between the tips of these two.

"The veins which run to the margin of the wing from the

præbrachial, or the discal, and the pobrachial areolets, scarcely admitting of any further classification, are comprehended under the general name of externo-medial veins, and the areolets adjacent to them are called externo-medial, and discriminated when necessary by their ordinal number, commencing with that nearest the tip of the wing. This one only, on account of the characters it affords, has received a peculiar name (the subapical areolet); it lies immediately behind the cubital areolet, and is bounded behind by a vein (the first of the externo-medial veins), which is also, when it has to be noticed, called subapical vein, or subapical portion of the præbrachial vein, of which in most of these cases it appears as the continuation. This subapical vein is often (Cyrtoneura, Alophora, Hyalomyia, Conops, Pangonia, and many Syrphidæ, &c.) curved, so as to meet the cubital vein and close the subapical areolet before the margin (many Muscidæ, Tachinini, Syrphidæ), or it is forked, and the anterior branch runs obliquely towards or to the cubital vein, and becomes to all intents a transverse vein (the subapical transverse), closing the subapical areolet as before mentioned.

"Sometimes another of the externo-medial areolets becomes closed before the margin (as in many Asilidæ, Cyrtus, &c.), the last but one of the externo-medial veins running obliquely or transversely to meet the last of them. In Nemestrina, and a few allied forms, the areolets towards the posterior margin and tip of the wing become so subdivided by supernumerary veins that it is only by comparison with simpler forms that we can trace the limits of the cubital area and the two branches of the cubital vein, the externo-medial veins being too complicated for any available denominations. But here, also, the præbrachial, discal, pobrachial and anal areolets being distinct, the boundaries of the externo-medial portion of the wing are still defined. The portion of the wing which lies behind the anal vein and beyond the axillary lobe, or sinus, is divided by the subaxillary vein into two open areolets, the axillary before and the subaxillary behind that vein, or if the vein be wanting the whole space is comprised under the former of these.

"In general, it is easiest to trace out the analogy and apply the nomenclature to the Diptera Brachycera. Among these, having followed out the gradual simplification of the system

of veins and change in their direction, little difficulty arises from such anomalies as an additional transverse vein, such as subdivides the subapical areolet into two in Microdon, or the pobrachial in Idioptera. The Hypocera are hardly to be reduced with certainty to an analogous type, but the simplicity of the veining and the contrast between the strong veins which end in the fore margin, and the faint ones (venulæ) which run to the hind margin, allow of and recommend a different and simple nomenclature.

"The Nemocera have a much greater variety in the veining of the wings, and there is not a little difficulty in accommodating to them the nomenclature used for the Brachycera, partly from the multiplication of longitudinal veins, as in the Psychodini, but yet more from the extreme faintness of the veins in many, as in Simulia, and the ultimate disappearance of all but one or two in the Cecidomyidæ. Still, apart from these extreme cases, we may observe such a degree of gradual modification of the veining in most as to be able to apply an analogous nomenclature to at least some of the principal veins, and by relation to them to denominate the rest; although it may be doubted whether it is not best to employ a different and simpler numerical nomenclature when the veins become few in number, and the closed areolets nearly null or insignificant. Rhyphus has been taken as the type by which to assimilate the nomenclature of the Nemocera to the Brachycera, as it is scarcely possible to overlook the analogy between Rhyphus and the Leptidæ and allied families of the Brachycera. From Rhyphus the transition is not difficult to the Tipulidæ, and thence to the Culicidæ. From the latter probably the Psychodini on the one hand, and the Chironomidæ on the other, may be illustrated with sufficient probability. The transition from the Tipulidæ to the Mycetophilidæ is more abrupt; and these last, in respect to the veining of the wings, not only undergo great diversities, but present two manifest types separated by as abrupt an interval. The first of these, characterized by the more or less complete coalescence of the præbrachial and pobrachial areolets (Bolitophila, Thaumalea, Macrocera, Platyura, Ceroplatus, Ditomyia, Asindulum, Diadocidia, Mycetobia), still preserves most analogy to the preceding family. The second, in which these two areolets are separated by a strong præbrachial vein, but

in which the pobrachial areolet is prolonged open to the hind margin (Sciophila, Tetragoneura, Leia, Gnoriste, Mycetophila, Cordyla): this type extends from Sciara to Zygoneura and Lestremia, and thence to Campylomyza and the Cecidomyiæ, in which the simplicity of the veining least of all admits or needs the application of the complicated nomenclature that may have been retained in the previous families. The Bibionidæ, in general, may perhaps be best illustrated by a comparison with the first type of Mycetophilidæ (as Platyura, &c.); see Rhyphus also; while Scatopse seems not remote from the second type of that family, and Aspistes presents a case almost as hard to the assumed type as is that of the Diptera Hypocera.

"The Culicidæ and Psychodini have the cubital vein simple, the radial forked. The Tipulidæ either have both these veins simple (Limnobia, Rhipidia, Rhamphidia, Symplecta, Idioptera), or the radial forked (Dixa),—Trichocera, Anisomera, Limnephila, Tipula, Ctenophora, Pachyrina, Nephrotoma, Erioptera, &c. In a very few cases (Ptychoptera, Limnophila immaculata, &c.) the veins divide in such a way that we must consider the radial as simple and the cubital forked. In nearly all other cases, when either of these is branched, it is the cubital, and this holds good among the other Macrocera (as Mycetophilidæ of the first section, and some Bibionidæ), as well as in the Brachycera. In Tipula and the allied genera—Pachyrhina, Nephrotoma, Megistocera, Ctenophora—there are five externo-medial areolets, of which two are behind the discal areolet, while in the rest,—Limnobia, Limnophila, Erioptera, Trichocera, Ptychoptera, &c.,—whether the externo-medial areolets be four or five, only one lies behind the discal areolet (which is sometimes wanting). Generally the anal areolet is open to the margin in the Nemocera, though there are a few exceptions (Eriocera nigra, *Macq.*, and Limnobia Trentepohlii, *Wied.*), and closed in the Brachycera, or nearly so; and in the latter families (Muscidæ, &c.), small and distant from the margin. In Cylindrotoma, Macq. Dipt. pl. I. f. 15, the subcostal vein seems to reunite with the radial before the end, the usual termination of the former being probably obliterated, and what is elsewhere a transverse vein connecting the subcostal and radial, here appearing as the termination of the former.

"Of the three areas into which Latreille divides the wing (exclusive of the extreme basilar area), the costal ends with the cubital vein, or its hindmost branch, if branched. The intermediate extends back from this to the anal vein, and the internal occupies the rest behind the anal vein. The first of these areas becomes very narrow in those Nemocera which lead to Cecidomyia, and recedes more and more from the tip of the wing, not the mediastinal alone, but the subcostal vein often disappearing. In other cases, and generally where the veining of the wing is most fully developed (Tabanidæ, Asilidæ), the costal area takes in the whole tip of the wing, though sometimes the intermediate area expands itself by the curvature of veins as it reaches the margin (so in Midas, &c.). The tip of the wing, therefore, may be considered as the medium point of limit at the margin between the costal and intermediate areas. When the costal vein vanishes without being continued round the posterior margin, it most commonly ends at the end of the subapical vein."

FRANCIS WALKER.

Additions to the List of Macro-Lepidoptera inhabiting Guernsey and Sark. By W. A. LUFF.

(See Entom. vi. 375.)

THE following were, with one exception, taken during 1873.

Sesia Philanthiformis.—One specimen. Captured in Guernsey on June 8th.

Nola cristulalis.—One. June 17th, in Guernsey.

Metrocampa margaritaria.—Not uncommon in Guernsey.

Odontopera bidentata.—Mr. Tunley took one in Guernsey, May 27th.

Ennomos angularia.—Bred a specimen on August 20th.

Himera pennaria.—One. Taken at light, in Guernsey, by Dr. Wakefield.

Nemoria viridata.—Beat several out of furze-bushes on the Guernsey cliffs.

Acidalia trigeminata.—Several specimens taken in Guernsey.

Macaria notata.—One specimen. Guernsey.

Eupithecia subumbrata.—Not common in Guernsey.

E. nanata.—Several in Sark.

Anticlea rubidata.—My notice of Berberata (Entom. vi. 356) must apply to this species. Berberata occurs in Guernsey, but I have only seen one specimen.

A. badiata.—Not rare in Guernsey.

Leucania albipuncta.—I find I have included a specimen of this insect amongst my series of Lithargyria. It was captured in 1871, on the flowers of the ragwort, in Guernsey.

Dasypolia Templi.—Mr. Dawson took one at rest in a conservatory, on November 20th, in Guernsey.

Axylia putris.—Common in Guernsey and Sark.

Xylophasia lithoxylea.—Common in Sark. I have taken a specimen in Guernsey.

Trigonophora empyrea.—A crippled specimen emerged in my breeding-cage on September 27th. The larva was found in Guernsey.

W. A. Luff.

Guernsey.

Entomological Notes, Captures, &c.

List of Insects taken at Glenarm, 1873.—Smerinthus Populi: bred. Bombyx Rubi: caterpillar, common on heath, September. Agrotis porphyrea: common on heath, September. Hybernia defoliaria: 9th December, 1873, by light. Cheimatobia brumata: 9th December, 1873, by light. Scotosia dubitata: 23rd November, 1873, hybernated females. Cidaria miata: October, hybernated. Sphinx Convolvuli: I saw a specimen of the above insect at Larne, about twelve miles from here, taken in September, 1873, by a miller, off the wall of the mill; it was showed to me for the death's-head moth.—*T. Brunton; Glenarm Castle, Larne, Ireland.*

Epunda lutulenta at West Wickham.—Referring to the notice in the December number of the 'Entomologist,' wherein Mr. Forbes informs us that he took Epunda lutulenta in his garden in September last, will you allow me to say that in September, 1866, while sugaring in West Wickham Wood with my friend Mr. Miller, we took one specimen of this species.—*J. R. Wellman; 14, Portland Place North, Clapham Road, S.W., December* 18, 1873.

Anticlea sinuata in Hampshire.—The occurrence of a specimen of this local insect—near Winchester, I believe—is recorded in the August number of this journal (Entom. vi. 456). This specimen was taken on the 10th of July, 1873. One evening, on the 30th of the same month, I was collecting on the borders of the New Forest, taking a few of the pretty little A. emarginata,—which, indeed, was about the only species to be met with, for everything has been unusually scarce this season,—and I was somewhat surprised to beat out a very good specimen of A. sinuata from a bush of hawthorn and bramble. I believe it is the first instance of its occurrence in the neighbourhood of the New Forest; and, although I visited the locality several evenings after my capture, I did not see another specimen. The one I caught is the first I ever saw *alive.—G. B. Corbin.*

Chauliodus chærophyllellus bred.—Towards the end of August last I gathered a few larvæ of this species from off the parsnep growing in my garden. The larva may be detected on the under side of the leaf, near the tip, by giving it a ragged appearance; it changes to pupa by making a netted web on the leaf, and the insect appears in a week or two afterwards. The larva is not much unlike that of Xylopoda Fabriciana.—*F. O. Standish;* 402, *High Street, Cheltenham, November* 30, 1873.

Cetonia aurata, or the Rose-beetle.—Not being a Coleopterist I do not know whether it will interest your readers to know that, while digging round an old ash-tree for pupæ of Lepidoptera, I turned out from a decayed part of the tree about a dozen of this beetle, each in a strongly-made earth-cocoon, similar to that of Cucullia Verbasci, except that it was free from web. May I ask if it is usual for this pretty beetle to hybernate in this singular way?—*Id.*

[It had probably fed on the decayed wood of the ash, and had emerged from the pupa state without flying. I do not think it could be said to have hybernated.—*E. Newman.*]

Carabus nitens in the New Forest.—During a day's collecting of Lepidoptera in the New Forest I caught two, and saw several others, of this lovely ground-beetle. They were running about in the *sunshine* on a boggy piece of heath, and seemed to lose much of their activity if the weather became cloudy. Is such a habit common to this species? as

we generally find that its relations, C. hortensis, C. violaceus, &c., are lovers of the night rather than of sunshine, for we often meet with ground-beetles when sugaring for Lepidoptera. Not being a collector of Coleoptera, I need hardly state that I am unacquainted with the habits of the lovely creatures included in that order.—*G. B. Corbin.*

Aphilothrix Radicis.—After Mayr's translated description of the gall of this species, Mr. Walker says, "This insect has not been found in England," &c. This I think must have been an oversight, as Mr. Marshall includes it in his descriptions of British Cynipidæ (Ent. Mo. Mag. vol. iv. p. 7); also Mr. Müller, in his list of British gall-insects (Ent. Ann. 1872, p. 6); and I have myself found it at Shirley, in Surrey, and at Rayleigh, in Essex. I believe it to be generally distributed were it only looked for.—*E. A. Fitch; Down Hall, Rayleigh, Essex, January* 3, 1874.

Hymenoptera reposing.—During the summer I saw what I supposed was some species of wild bee attached to the end of a blade of grass, and as the weather was dull and the wind blowing somewhat briskly it was swayed backwards and forwards, and continually buffetted by the surrounding herbage, yet it held on firmly, without taking any apparent notice of such rough usage, until I attempted to box it, when it immediately flew away. I believe I have seen a record of a similar occurrence in some journal, but I forget where. Is such a habit of general occurrence, and what is the name of the species possessing such a peculiarity, or are there more than one? To all appearance the insect seemed asleep when I first saw it in its peculiar swinging situation, but as soon as I touched the blade of grass with my finger it flew away, although I did not disturb it half so much as the wind had previously done. I did not see the insect settle upon the grass-stem, so I cannot say whether it crawls up, or at once settles at the point, but it does seem a strange situation for an insect to be "rocked to sleep;" but why should I call it strange, when the peculiarities and economy of almost every insect are so wonderfully interesting. Possibly this habit is well known to those who have made the Hymenoptera their especial study,—if, indeed, I am right in referring the insect I saw to that order,—and who will, I hope, give us a fuller account of the insect, or insects, which choose such a position

to rest (?) in, and under what conditions it is chosen?—*G. B. Corbin.*

[This habit is very familiar to Hymenopterists; I have observed it in several species of Nomada, and also in Chelostoma florisomne. These observations have been frequently recorded, and have been styled "roosting by the mandibular process."—*Edward Newman.*]

Lime-galls.—In the 'Fifth Annual Report on Insects of the State of Missouri,' by C. V. Riley, there is a figure (p. 119) of a gall that grows on the vine-leaf, and the author remarks that similar, but distinct, galls grow on the leaves of hickory and hackberry. Each of these vine-galls contains a pale orange larva, made by a Cecidomyia, which has not yet been described. These galls exactly resemble the excrescences which may be seen here and there on lime-leaves in England, but no insects have been found in these excrescences, except an Acarus, as was mentioned in a French publication, which I cited many years ago in a notice on these formations. It is uncertain whether this Acarus, or mite, is identical with one or other of two kinds of mites which often occur under lime-leaves,—the green Tetranychus Tiliarium, which I have before spoken of, and the little white Acarus, which transfers to itself the hollow remnants of the Aphides, whose contents have been already appropriated by Aphidii. The round red gall on the twigs of the lime is of more frequent occurrence than the lanceolate formation before mentioned, and is inhabited by the grub of Sciara tilicola, which leaves them and enters the earth, and there assumes the imago state.—*Francis Walker.*

Extracts from the Proceedings of the Entomological Society of London, November 17 *to December* 1, 1873.

Deilephila Euphorbiæ and Sphinx Pinastri at Harwich.—Mr. Higgins exhibited two bred specimens of Deilephila Euphorbiæ (one a remarkable variety), and a Sphinx Pinastri, taken near Harwich in June, 1872, when several specimens of the former were found in the larva state.

Pachnobia alpina from Braemar, &c.—Mr. Champion exhibited a bred specimen of Pachnobia alpina from Braemar; also Harpalus quadripunctatus from Braemar; Anisotoma

macropus from Claremont; A. pallens from Deal; Liosomus Troglodytes from Faversham; and L. oblongulus from Caterham.

Brachycentrus subnubilus Bred.—Mr. W. C. Boyd exhibited living larvæ of Brachycentrus subnubilus, which had been reared from the eggs. They fed upon Confervæ, and the cases constructed by them were clearly quadrangular (though the angles were not prominent) and very diaphanous, so that the movements of the larvæ could be discerned within.

Pempelia Davisella Bred.—Mr. Vaughan exhibited Pempelia Davisella reared from larvæ, feeding in a web, upon shoots of Ulex.

Biorhiza aptera on Roots of Deodars.—Mr. Müller remarked that at a meeting of the Scientific Committee of the Royal Horticultural Society, on the 12th instant, Dr. Masters had exhibited some galls found at Wimbledon on the roots of Deodars. That gentleman had since submitted to him further specimens of this gall, which he had found to agree, in external and internal structure, with those of Biorhiza aptera, *Fab.*, usually occurring on roots of oak. Mr. Müller stated that he had since bred several specimens of Biorhiza aptera from these Deodar galls, and that he believed it to be the first instance where a true Cynips had been known to transfer its attacks from oak to any species of Conifer.

Hybrid specimen of Clostera.—Mr. Bond exhibited a hybrid specimen between Clostera curtula and C. reclusa, partaking of the characters of both parents.

Congregation of Psen.—Mr. Jenner Weir exhibited specimens of a minute species of Psen, which he had observed in large numbers in June last, on a pear-leaf at Lewes. They had congregated together on the surface of the leaf like a swarm of bees, though it was not apparent what motive brought them together.

Humble-bees wanted for New Zealand.—Mr. Dunning read some portions of a letter which he had received from Mr. Nottidge, enclosing the Eighth Report of the Canterbury (New Zealand) Acclimatization Society, and stating that the red clover had been introduced into the colony, but that they had no humble-bees to fertilize the plant. Also that certain Lepidopterous insects had been accidentally imported into

the islands, and that corresponding ichneumons were wanted to keep down their numbers. He would be glad of any suggestions as to the best mode of introducing such humble-bees and ichneumons into the colony, as might be requisite. It was suggested that by procuring a sufficient number of humble-bees in a dormant condition, and keeping them in this state (by means of ice) during the voyage the result might be attained.

No indigenous Aphides in New Zealand.—Mr. M'Lachlan mentioned that he had received a letter from Capt. Hutton, from New Zealand, stating that indigenous Aphides did not, apparently, exist there, but imported species were becoming very destructive, and he asked if it would be possible to introduce Chrysopa.—*F. G.* [*Selected by E. Newman.*]

Proceedings of the South London Entomological Society, January 1st and 15th, 1874.

Mr. J. Jenner Weir exhibited two cases to illustrate "mimicry," and explained the meaning of the word in its relation to insects. The species included Papilio Merope, a species of Heliconian, another of Pieris, together with the various forms of Danaids, which they resemble (or mimic). Amongst British insects Nemeobius Lucina may be said to be a good representative of mimicry, as it closely resembles Melitæa Athalia, and is very unlike its congeners.

The President exhibited a case of bred specimens of Cidaria russata from various parts of Britain.

Mr. Barrow exhibited two large species of Orthoptera from the Cape of Good Hope.

Donations of the 'Entomologist' and 'Zoologist' for January, 1874, from Mr. Newman, and of a copy of 'The Origin and Metamorphoses of Insects,' from Sir John Lubbock, Bart., M.P., were announced, and votes of thanks passed to the donors.

Mr. Harris exhibited living specimens of Isotoma trifasciata and Macrotoma plumbea.

Mr. Hoey exhibited the larvæ and pupæ of Nonagria geminipuncta, Leucania Phragmitidis, Sesia Tipuliformis, and Tinea tapetzella.—*J. P. B.*

THE ENTOMOLOGIST.

No. 127.] MARCH, MDCCCLXXIV. [Price 6d.

Argynnis Adippe (melanic variety: Upper and Under sides).

Variety of Argynnis Adippe.—I am indebted to Mr. C. S. Gregson for the loan of this beautiful specimen, which he sent me purposely for figuring in the 'Entomologist.' On the upper side the costal margin itself is black, and immediately beneath this is a narrow fulvous stripe extending from the

base of the wing nearly to its apex; the distribution of fulvous and black on the remainder of the wing is clearly indicated in the figure, from which it will immediately be seen that black greatly predominates; the basal portion of the wing is iridescent fulvous, and the colour extends along the inner margin to the anal angle; on the hind wing the disk is almost entirely black, the inner margin being tinged with fulvous iridescence, and the hind margin having a double series of fulvous lunules. On the under side the central portion of the fore wing is almost entirely black; the hind wings have five silver spots about the base, but none on other parts of the wing; the median diagonal series of silver spots is entirely absent, but their position is indicated by a series of obscure markings.—*Edward Newman.*

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.' By Miss Anna Weise.

II. Bark-galls.

The three species next to be described are generally found more or less covered with earth, moss, or dead leaves, on the lowest parts of the stem, or on shoots growing out of the ground; others only occur on that portion of last year's shoots which is above the ground: they are almost invariably in clusters, and in two instances are perceptible only from the unevenness of the bark or the incrassation of the twig.

Fig. 3.

A. Corticis.

Aphilothrix Corticis.—Of this rare gall I have seen only a few clustered specimens. It is of an obconical form, and swells about seven or nine millemetres above the surface of the bark of old oak-stems (probably of Quercus sessiliflora or Q. pedunculata). The aperture at the apex is from three and a half to five millemetres in diameter; more than half of the gall is sunk in the bark, which seems to form a wall round it. It is hard, of a brown colour, and somewhat cylindrical in shape, but more or less compressed: the opening is sharply defined and nearly circular; within the opening, and about a millemetre or a millemetre and a half below the summit, is a convex septum,—thin, hard, and of

a yellowish colour; in the space between them and the margin is a circle of scabrous points. In the interior is a large larva-cell, and a hole in the convex septum shows where the imago has escaped.—*G. L. Mayr.*

Aphilothrix Corticis is accompanied in the gall by Synergus incrassatus, which has already been mentioned as a tenant in the gall of Aphilothrix Radicis, and is one of the winter species, Dr. Mayr having divided the Synergi into winter flies and summer flies according to the time of their appearance. The following note refers to the likeness of oak-galls to organs of the oak. The differences of the parts of an organism, such as the oak, and the means which successively occasion these differences, are of much interest, as the result of one agent,—the circulation in the living form. But the differences between the kinds of oak-galls are more remarkable: they are also the products of the circulation of the oak, and therefore it would seem to be likely that they must resemble the native products of that circulation; and such in some kinds is the case. But two kinds of galls, quite different in structure, may be found in close contiguity, or almost connected, on the oak; and it remains to be ascertained whether this difference is caused by the puncture, by the egg, by the grub, or by the joint influence of these three.—*Francis Walker.*

Aphilothrix Rhizomatis.—This occurs partly under ground and partly on those shoots which are but slightly raised above the ground: a roughness or unevenness in the bark is observable, and a crack or furrow appears, in which the galls are seated in sparse clusters: the visible portion of each gall is conical or hemispherical, or sometimes nearly oval, and of an ochreous colour; at the base of the cone are striæ or furrows, similar to those on the species next to be described, but these vanish towards the summit, where no trace of such striæ is perceptible; the summit itself is rounded, and is pierced in the centre by the imago in making its escape. Each gall contains one large larva-cell, the exposed portion of which is from two to three millemetres in

Fig. 4.

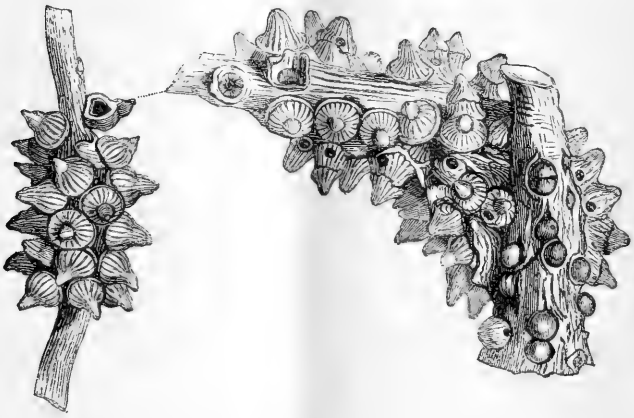
A. Rhizomatis.

height, and 3·5 to 5·5 millemetres in diameter at the base. Of this rare gall I have only one small branch, with a number of galls on it: it seems to be found only on Quercus sessiliflora or Q. pedunculata, as these are the only oaks growing in Nassau, the country from which my specimen was recorded.—*G. L. Mayr.*

No inquiline has been observed in this gall.—*F. Walker.*

When nothing is said of the occurrence of the gall in Britain, it is to be assumed that nothing has been recorded, but we must on no account conclude that it is absent on this ground, but that it has escaped observation. We have scarcely a dozen entomologists who collect oak-galls, and therefore many species will of necessity escape notice.—*Edward Newman.*

Fig. 5.



Aphilothrix Sieboldii.

Aphilothrix Sieboldii.—This red or reddish brown gall is found under or near the surface of the ground, on twigs that are one centimetre or one and a half centimetre in diameter. It seldom occurs alone, but numbers of them are usually found crowded together, and the twig may possibly attain a diameter of three centimetres. The gall itself is conical: it stands from five to six millemetres in height, and its

diameter at the base is about the same, but is sometimes narrower than this, and sometimes even broader; from the base to the apex it is thickly and coarsely striped or furrowed, and its surface is smooth. Single galls, or those not very crowded, are perceptible on the outside on short or uneven space of the bark, which latter, however, can only be regarded as a ring, for the base of the gall penetrates farther into the bark than the periphery, so that half of the spacious larva-cell is below the circumference of the cone. The substance of the gall is composed of two thinnish layers: the outer one, of a reddish colour, is doubtless full of sap; while the inner, which is yellowish, is hard and sharply furrowed, from the circumference of the cone to the apex, in a way that makes the furrows appear deeper at the circumference than nearer the apex; the striæ, or the outer layer, unquestionably result from its adhering so closely to the grooves and furrows of the inner layer during the slow process of drying. In old galls the outer layer is generally cracked, and we then only see the brownish yellow inner layer. In this condition the deeper furrows round the periphery of the cone appears as dots; the aperture through which the imago makes its escape is on the side, and above the periphery of the cone.

M. von Siebold has been so kind as to send me typical specimens, found at Dantzig and Friebourg on Quercus sessiliflora, and from these it appears that Professor Schenck considers this gall to be that of Cynips corticalis of Hartig. Now, as Hartig's description of Corticalis is such that one cannot distinguish it from A. Sieboldii; and, moreover, as Hartig doubtless applies the reference to "Malpighi (*op. omn.* tab. 17, fig. 60"), although the figure of the gall represents that of A. Sieboldii, I think it very probable that C. corticalis and C. Sieboldii are synonyms of the same species, and that Hartig, when describing his Corticalis, had only ill-preserved specimens at his disposal. I therefore feel justified in retaining the later name, since under that name the gall is minutely described, and typical specimens have been submitted to me for examination.—*G. L. Mayr.*

Synergus incrassatus inhabits this gall.—*F. Walker.*

I think it will be impossible for an entomologist to examine attentively the beautiful figures of the bark-galls,

produced by Aphilothrix Sieboldii, without perceiving their very close correspondence with the small aborted acorns we find so commonly on the long peduncles of Quercus pedunculatata. On these peduncles it is not unusual to find *one* normally developed acorn near the base, and one, two, or three aborted acorns beyond it, as though the first had appropriated the sap destined for the nutriment of the others, as well as its own. These aborted acorns are manifestly represented by the galls in question, the stigma in both instances being the only part of the acorn that protrudes beyond the cup.—*Edward Newman.*

The Synergi—or fellow-workers, or inquilines, or lodgers—have been lately mentioned in the 'Entomologist,' and a short abstract of Dr. Mayr's treatise on them may be of use to the observers of galls. He praises Hartig's work as being a good foundation for the history of oak-gall-making flies, but observes that the above author is less successful with regard to the Synergi, which failure, he says, may be owing to the great difficulty in determining the often very variable species. He adds that these difficulties can only be overcome by continual researches, and by complete and plentiful materials brought together and well arranged. He next says that he has particularly studied the lodgers for a series of years, and mentions his examination of Hartig's type specimens, and the help he has received from correspondents, and the division by Foerster of Hartig's genus Synergus into two genera, Synergus and Sapholytus, and notices the characters of these two genera, and also of Ceroptre, Phanacis, Periclistus, and Xenophanes. The genus Ceroptre, he says, is interesting on account of its biology. He has reared from C. arator, *Hart.*, more than six hundred females, but not one male; and of C. Cerri, *Mayr*, ninety-eight females, and only four males, and he supposes that only some few females are impregnated, but that the unfertilized also lay developing eggs. He then defines two kinds of parthenogenesis: the mixed parthenogenesis, of which C. Cerri is an example; and the Thelykotik, or simple female parthenogenesis, represented by C. Arator. He next returns to the difficulty of ascertaining the species of Synergus, owing to their great variableness, of which S. melanopus, that lives in many kinds of galls, is the chief example, and concludes that most

of the hitherto described species of Synergus have not been clearly distinguished from each other. He has many proofs that two certainly different kinds of lodgers live together in one gall; and he gives in short the result of his observations on C. lignicola. He isolated about four hundred galls of this species. From most of these only the Cynips appeared; the rest gave the following results:—sixteen galls produced only Synergus melanopus; two, S. melanopus and a Eurytoma; twenty-eight, only S. Hayneanus; five, S. Hayneanus, with S. melanopus; two, only S. pallidipennis; three, S. pallicornis; one, S. pallicornis and S. melanopus; one, S. vulgaris; two, the Cynips and S. melanopus; one large gall produced the Cynips, seven examples of S. melanopus, and one Eurytoma; four, the Cynips and S. pallicornis; and lastly, two, a Pteromalus. In the galls from which the Cynips and the Synergus appeared the cell of the first was quite closed and normally formed, but the cells of the lodgers were separate in the parenchyma. He mentions a gall of C. cerricola, which afforded him in April nineteen examples of S. thaumacera, and in May two of S. variabilis and three of Eurytoma: these all came from one hole, the passage to which was divided, and led from many chambers. It thus seems that in general the contrivances of the lodgers cause the death of the proprietor, for in sixty galls seven produced the Cynips and the Synergus; the latter only or the parasite proceeded from the rest, and the imprisonment of the Cynips by the Synergus was first observed by Spinola. Life in these kinds of galls may be divided into two parts,—the inner life and the outer life,—the first represented by the Cynips and its parasites, the latter by the Synergus and its attendants; and the multiplying of the Cynips is not only limited by its parasites, but by the Synergi in the outer life; and in case the latter are the victims of other parasites, their habitations are not the less obstacles to the emergence of the Cynips; and the complications of life-forms in a gall are a little epitome of biology generally, with regard to insects. Dr. Mayr observes on the strangeness of the fact, and of its being worthy of close study, that a Synergus lives in one kind of gall three to four months, but in another kind a year or more. The species which appear in winter are more numerous than those which appear in summer, and those which are

disclosed in both seasons use one kind of gall for the winter and another kind for the summer.—*Francis Walker.*

'*The Naturalist in Nicaragua:*' *a Narrative of a Residence at the Gold-mines of Chontales, in the Savannahs, and Forests; with Observations on Animals and Plants in reference to the Theory of Evolution of Living Forms.* By Thomas Belt, F.G.S. London: John Murray, 1874. Post 8vo; 404 pp. letterpress, and 26 Illustrations on stone and wood.

[At Brighton anglers bait for mackerel with a bit of tin: it glitters in the sun, and proves far more attractive to these silly fishes than substantial, wholesome, and natural food. Mr. Belt baits for Natural-History readers with "evolution of of living forms." He evidently aims to capture a shoal of naturalists, and considers this the most "kililng bait." I think he under-rates us; I think he under-values our attainments and our intelligence: we are not, like the mackerel, to be caught by tin or tinsel; and this very announcement on the title-page had well-nigh induced me to close the book unread. Fortunately I did not, for 'The Naturalist in Nicaragua' is a capital book,—brimful of information, and worthy of attentive study by the most profound entomologist. I have no space in this journal for an extended review, but I will make some entomological extracts, which cannot fail both to instruct and delight my readers, and will recommend the book far more than anything I can write in its praise.—*Edward Newman.*]

Ecitons, or Foraging Ants.—"I saw many large armies of this, or a closely allied, species in the forest. My attention was generally first called to them by the twittering of some small birds, belonging to several different species, that follow the ants in the woods. On approaching, a dense body of the ants—three or four yards wide, and so numerous as to blacken the ground—would be seen moving rapidly in one direction, examining every cranny, and underneath every fallen leaf. On the flanks, and in advance of the main body, smaller columns would be pushed out; these smaller columns would generally first flush the cockroaches, grasshoppers, and spiders.

The pursued insects would rapidly make off, but many in their confusion and terror would bound right into the midst of the main body of ants. At first the grasshopper, when it found itself in the midst of its enemies, would give vigorous leaps, with perhaps two or three of the ants clinging to its legs; then it would stop a moment to rest, and that moment would be fatal, for the tiny foes would swarm over the prey; and after a few more ineffectual struggles it would succumb to its fate, and soon be bitten to pieces and carried off to the rear. The greatest catch of the ants was, however, when they got amongst some fallen brushwood: the cockroaches, spiders, and other insects, instead of running right away, would ascend the fallen branches and remain there, whilst the host of ants were occupying all the ground below. By and bye up would come some of the ants, following every branch, and driving before them their prey to the ends of the small twigs, when nothing remained for them but to leap, and they would alight in the very throng of their foes, with the result of being certainly caught and pulled to pieces. Many of the spiders would escape by hanging suspended by a thread of silk from the branches, safe from the foes that swarmed both above and below."—P. 18.

Leaf-cutting Ants.—"Nearly all travellers in tropical America have described the ravages of the leaf-cutting ants (Œcodoma): their crowded, well-worn paths through the forests; their ceaseless pertinacity in the spoliation of the trees, more particularly of introduced species, which are left bare and ragged, with the midribs and a few jagged points of the leaves only left. After travelling for some hundreds of yards, often for more than half a mile, the formicarium is reached. It consists of low, wide mounds of brown, clayey-looking earth, above and immediately around which the bushes have been killed by their buds and leaves having been persistently bitten off as they attempted to grow after their first defoliation. Under high trees in the thick forest the ants do not make their nests, because I believe the ventilation of their under-ground galleries, about which they are very particular, would be interfered with, and perhaps to avoid the drip from the trees. It is on the outskirts of the forest, or around clearings, or near wide roads that let in the sun, that these formicariums are generally found: numerous

round tunnels, varying from half an inch to seven or eight inches in diameter, lead down through the mounds of earth; and many more, from some distance around, also lead underneath them. At some of the holes on the mounds ants will be seen busily at work, bringing up little pellets of earth from below and casting them down on the ever-increasing mounds, so that its surface is nearly always fresh and new-looking. Standing near the mounds one sees from every point of the compass out-paths leading to them, all thronged with the busy workers carrying their leafy burdens. As far as the eye can distinguish their tiny forms troops upon troops of leaves are moving up towards the central point, and disappearing down the numerous tunnelled passages. The out-going, empty-handed hosts are partly concealed amongst the bulky burdens of the in-comers, and can only be distinguished by looking closely amongst them. The ceaseless, toiling hosts impress one with their power, and one asks—What forests can stand before such invaders? how is it that vegetation is not eaten off the face of the earth? Surely nowhere but in the tropics, where the recuperative powers of Nature are immense and ever-active, could such devastation be withstood."—P. 71.

Making Ants Mad.—"Don Francisco Velasquez informed me, in 1870, that he had a powder which made the ants mad, so that they bit and destroyed each other. He gave me a little of it, and it proved to be corrosive sublimate. I made several trials of it, and found it most efficacious in turning a large column of the ants; a little of it sprinkled across one of their paths in dry weather has a most surprising effect: as soon as one of the ants touches the white powder it commences to run about wildly, and to attack any other ant it comes across. In a couple of hours round balls of the ants will be found all biting each other, and numerous individuals will be seen bitten completely in two, whilst others have lost some of their legs or antennæ. News of the commotion is carried to the formicarium, and huge fellows, measuring three-quarters of an inch in length, that only come out of the nest during a migration or an attack on the nest or one of the working columns, are seen stalking down with a determined air, as if they would soon right matters. As soon, however, as they have touched the sublimate all their stateliness leaves them: they rush about, their legs are seized hold of by some

of the smaller ants already affected by the poison, and they themselves begin to bite, and in a short time become the centre of fresh balls of rabid ants. The sublimate can only be used effectively in dry weather. At Colon I found the Americans using coal-tar, which they spread across their paths when any of them led to their gardens. I was also told that the Indians prevent them from ascending young trees by tying thick wisps of grass, with the sharp points downwards, round the stem: the ants cannot pass through the wisp, and do not find out how to surmount it, getting confused amongst the numberless blades, all leading downwards. I mention these different plans of meeting and frustrating the attacks of the ants at some length, as they are one of the greatest scourges of tropical America, and it has been too readily supposed that their attacks cannot be warded off. I myself was enabled, by using some of the means mentioned above, to cultivate successfully trees and vegetables of which the ants were extremely fond."—P. 78.

Spiders.—"Near the river were some fallen-down wooden sheds, partly overgrown with a red-flowered vine: here a large spider (*Nephila*) built strong yellow silken webs, joined one on to the other, so as to make a complete curtain of web, in which were entangled many large butterflies, generally forest species, caught when flying across the clearing. I was at first surprised to find that the kinds that frequent open places were not caught, although they abounded on low, white-flowered shrubs close to the webs; but, on getting behind them and trying to frighten them within the silken curtain, their instinct taught them to avoid it, for, although startled, they threaded their way through open spaces and between the webs with the greatest ease. It was one instance of many I have noticed of the strong instinct implanted in insects to avoid their natural enemies."—P. 108.

Spiders.—* * * * "To return to the spiders. Besides the large owner and manufacturer of each web, who was stationed near its centre, there were on the outskirts several very small ones, belonging, I think, to two different species, one of which was probably the male of a Thomisus, the males in this genus being much smaller than the females. I sometimes threw a fly into one of the webs: the large spider would seize it and commence sucking its blood; the small ones,

attracted by the sight of the prey, would advance cautiously from the circumference, but generally stop short about half-way up the web, evidently afraid to come within reach of the owner, thus having to content themselves with looking at the provisions, like hungry urchins nosing the windows of an eating-house. Sometimes one would advance closer, but the owner would, when it came within reach, quickly lift up one of its feet and strike at it, like a feeding-horse kicking at another that came near its provender, and the little intruder would have to retire discomfited. These little spiders probably feed on minute insects entangled in the web, too small for the consideration of the huge owner, to whom they may be of assistance in clearing the web."—P. 110.

Tiger-beetles and Ants.—"In some parts brown tiger-beetles ran or flew with great swiftness; in others, leaf-cutting ants in endless trains carried along their burdens of foliage, looking, as they marched along with the segments of leaves held up vertically, like green butterflies, or a mimic representation of a moving Birnam Wood. Sometimes the chirping of the ant-thrushes drew attention to where a great body of army-ants were foraging amongst the fallen branches, sending the spiders, cockroaches and grasshoppers fleeing for their lives, only to fall victims to the surrounding birds. On the fallen branches and logs I obtained many longicorn-beetles; the wood-cutters brought me many more; and from this valley were obtained some of the rarest and finest species in my collection. On the myrtle-like flowers of some of the shrubs large green cockchafers were to be found during the dry season, and bright green rosechafers were to be found also common. I was surprised to find on two occasions a green-and-brown bug (Pentatoma punicea) sucking the juices from dead specimens of this species."—P. 127.

Migrating Butterflies.—"As we rode along great numbers of a brown-tailed butterfly (*Timetes Chiron*) were flying over to the south-east: they occurred, as it were, in columns. The air would be comparatively clear of them for a few hundred yards, then we would pass through a band, perhaps fifty yards in width, where hundreds were always in sight, and all travelling one way. I took the direction several times with a pocket-compass, and it was always south-east. Amongst them were a few yellow butterflies, but these were

not so numerous as in former years. In some seasons these migratory swarms of butterflies continue passing over to the south-east for three to five weeks, and must consist of millions upon millions of individuals, comprising many different species and genera. The beautiful tailed green-and-gilded day-flying moth (*Urania Leilus*) also join in this annual movement."—P. 152.

[It is curious that Mr. Belt, who has seen this beautiful butterfly, should accept the strange hypothesis that it is a moth. It is one of the moth-butterflies, or concealers (Celantes), in which the caterpillars hide themselves in a silken follicle, or cocoon, before changing into chrysalids. All the skippers, or Hesperidæ, belong to the same natural division.—*Edward Newman.*]

The Bull's-horn Thorn.—"These thorns are hollow, and are tenanted by ants that make a small hole for their entrance and exit near one end of the thorn, and also burrow through the partition that separates the two horns, so that the one entrance serves for both. Here they rear their young; and in the wet season every one of the thorns is tenanted, and hundreds of ants are be seen running about, especially over the young leaves. If one of these be touched, or a branch shaken, the little ants (*Pseudomyrma bicolor*, Guer.) swarm out from the hollow thorns, and attack the aggressor with jaws and sting. They sting severely, raising a little white lump that does not disappear in less than twenty-four hours."—P. 218.

Mimicry in a Spider.—"On the leaves of the bushes there were many curious species of Buprestidæ, and I struck these and other beetles off with my net as I rode along. After one such capture I observed what appeared to be one of the black stinging-ants on the net: it was a small spider that closely resembled an ant, and so perfect was the imitation that it was not until I killed it that I determined it was a spider, and that I need not be afraid of it stinging me. What added greatly to the resemblance was that, unlike other spiders, it held up its two fore legs like antennæ, and moved them about just like an ant. Other species of spiders closely resemble stinging-ants: in all of them the body is drawn out long like an ant, and in some the maxillary palpi are lengthened and thickened, so as to resemble the head of one."—P. 314.

List of Lepidoptera forwarded to Edward Newman by G. F. Mathew, Esq., R.N.

[The names of the butterflies have been most kindly supplied by Mr. Hewitson; those of the moths by Mr. Walker. —*Edward Newman.*]

No. 22. *Junonia Lavinia.* Rio de Janeiro; Callao; Peru. September, 1872; April, 1873.—Woods at Tijuca, near Rio, and also near Callao and Lima. It is frequently seen alighting in pathways or bare spots, where it rests with its wings widely expanded and pressed close to the ground. I believe I took the larvæ of this species near Lima, but they were not full grown, and all perished on board ship, as I could not procure their proper food in the immediate neighbourhood of Callao.

No. 30. *Anartia Amathea.* Rio de Janeiro. September, 1872.—This pretty species is one of the most common butterflies near Rio, haunting marshy ground in woody places, where dozens of them may be seen flying about together. They are very fond of chasing each other, and usually fly slowly and near the ground, but when frightened they go off at a very respectable pace.

No. 31. *Eudamus Eurycles.* Rio; Callao. September, 1872; April, 1873.—A common species. It flies rapidly, after the manner of all skippers, and is found in woods and waste places, where it delights to fly among long grass and low underwood; consequently the tails soon become damaged. They are very pugnacious, chasing and fighting every other butterfly, no matter its size, that comes within their reach.

No. 58. *Agraulis Vanillæ.* Rio; Callao. September, 1872; April, 1873.—I only saw half a dozen of this species in a marshy piece of ground near Rio, but at Callao it was very plentiful in grassy meadows. There appears to be no difference whatever between the specimens from each country. The one enclosed is from Rio.

No. 92. *Papilio Archemas.* Valparaiso. November, 1872.—The largest butterfly found near Valparaiso, and it is common, though local, in the valleys between the hills, and also in the flat country near Vino del Mar and El Salto. It flies fast, is difficult to catch, and is seldom perfect. I have worked out the life-history of this species. The specimen

forwarded, which is slightly crippled, was bred at sea on the 7th inst., in lat. 35° 4′ N., long. 161° 1′ W., after having been in the chrysalis state since November last.

No. 93. *Pieris Xanthodice.* Valparaiso. November, 1872. —Common. I have partially worked out the life-history of this species, and should have done so had we remained at Valparaiso a few days longer. The larvæ feed on a wild species of cress, and also in gardens on wallflower. Male and female specimens are forwarded.

No. 94. *Colias rutilans* (male). Valparaiso. November, 1872.—Damp meadows at Limache, about thirty miles inland from Valparaiso.

No. 98. *Colias rutilans* (female). Valparaiso. November, 1872.—Rather a scarce butterfly. Is it a variety or female of No. 94? It is frequently found where No. 94 is not.

No. 99. *Hesperia paniscoides.* Valparaiso. November, 1872.—Very common.

No. 100. *Hesperia fulva.* Valparaiso. November, 1872. —Very common.

No. 103. *Thecla* (new species). Valparaiso. November, 1872.—Scarce. Flies round the tops of bushes like a Thecla.

No. 105. *Lycæna chilensis.* Valparaiso. November, 1872. —Common. The female has an orange-coloured blotch in the centre of the fore wings.

No. 106. Same as No. 103. Valparaiso. November, 1872. —Common in dry, grassy spots.

No. 116. *Epinephele* (new species). Valparaiso. November, 1872. Abundant everywhere. Habits similar to those of S. Tithonus.

No. 117. *Satyrus chilensis.* Valparaiso. November, 1872. —Common. Seldom found below an elevation of eight hundred feet. Habits of S. Semele.

No. 118. *Epinephele* (new species). Valparaiso. November, 1872.—Mountain gorges at a considerable elevation, flying among a stunted description of cane.

No. 123. *Satyrus Montrolii.* Valparaiso. November, 1872.—Appeared towards the end of the month in woody mountain gorges. Rather common.

No. 124. *Hesperia fasciolata.* Valparaiso. December, 1872.—El Salto, about seven miles from Valparaiso. Not common.

No. 125. *Euptoieta Claudia.* Valparaiso. December, 1872.—Limache and El Salto. Rare. Flies rather weakly.

No. 127. *Callidryas Eubule* (male and female). Valparaiso. December, 1872.—Tolerably common, but flies fast and is difficult to catch. I have worked out the life-history of this species, and bred several fine specimens.

No. 139. *Epinephele* (new species). Valparaiso. December, 1872.—Appeared towards the end of the month, and was by no means numerous.

No. 140. *Terias Beigitta.* Valparaiso. January, 1873.—Common, but very local, and is a weak flyer.

No. 141. *Syrichthus Americanus.* Valparaiso. January, 1873.—Common, but extremely local. I have another species (but only a single example) from Valparaiso, which comes pretty near this one.

No. 169. *Deilephila Daucus.* Valparaiso. Various dates.—A maritime species, and I have worked out its life-history.

No. 171. *Ctenucha* (new species). Coquimbo. March 1873.—These singular moths were very abundant in the marshes between Coquimbo and La Serena. They fly straight and rather heavily in the bright sunshine, carrying their antennæ aloft at right angles to their bodies, which gives them a peculiar appearance. Their flight somewhat resembles that of Anthrocera, but they are more active. A tall, umbelliferous plant, which was in blossom and grew in patches here and there throughout the marshes, was much frequented by them, and on approaching one of these patches the moths flew off in clouds.

No. 172. New species. Arica; Peru. March, 1873.—Habits and locality, where found, similar to the above; but the insect was rare.

No. 179. New species. Arica; Payta; Peru. March, 1873.—Flies, after the fashion of a Thecla, round the branches of an evergreen prickly and stunted bush growing close to the beach.

No. 180. New species. Arica; Callao. March, 1873.—Very abundant, especially in some lucerne fields, where they occurred in countless thousands.

No. 182. *Hesperia fasciolata.* Arica; Callao. March, 1873.—This species also occurred in prodigious numbers, and I often had a dozen or more in my net at a time.

No. 183. *Pieris Monuste.* Callao. April, 1873.—Common. This species puzzles me, as I fancy there are two or three closely allied, but distinct.

No. 184. *Pieris Monuste.* Callao. April, 1873.—Probably the female of No. 183.

No. 185. *Anartia Jatrophæ.* Callao. April, 1873.—This pretty and delicate butterfly was common close to the town of Callao; but although I caught plenty of them very few were fit to set. I suspect they were just passing. In its habits this species reminded me of V. Urticæ. When disturbed it flies for a short distance, and settles on the road or a wall, and constantly expands and shuts its wings. It is a strong flyer.

No. 187. *Thecla Marsyas.* Callao. April, 1873.—This lovely species was by no means uncommon in the neighbourhoods of Callao and Lima. Its habits are those of a Thecla. Near Callao I obtained it flying round an evergreen shrub growing from eight to ten feet high, possessing ovate-lanceolate and slightly pubescent leaves, and bearing at the tip of each of its branches a conglomerate bunch of mauve-coloured flowers.

No. 189. New genus, new species. Valparaiso. Larvæ taken in December, 1872.—Bred on board. Have worked out the life-history of this species.

No. 193. *Hipparchia?* Valparaiso. Larvæ taken in January, 1873.—Bred on board. Took the larvæ of this species at Limache, and have worked out its history. The specimen forwarded is a small one, as some I have bred are nearly twice the size.

No. 200. *Acræa Alalia.* Callao. April, 1873.—Have worked out the life-history of this species. It is very abundant at Callao, though local.

No. 212. New species. Callao. April, 1873.—This is, I have no doubt, the male of No. 180, as they occurred together.

No. 219. *Hadena?* (new species). Honolulu. June, 1873. —This is the produce of what the Hawaiians term the "army worm," a larva which does great mischief to their pasture lands; and the specimens sent herewith were bred from larvæ taken by myself. These larvæ, which I observed in incredible numbers, and which feed perfectly exposed,

vary slightly in colour. Their general hue is deep olive velvety-green, with alternate stripes of madder-purple and pale yellow; spiracles orange; head, prolegs and claspers varying from madder-purple to sap-green. Some of the larvæ were darker, and some paler than others. They undergo pupation about an inch below the surface, where in a brittle cocoon, composed of the surrounding earth, they change to a bright reddish brown pupa. The perfect insects differ as much as the larvæ, as can be seen by the two examples now forwarded. In some places, where the larvæ had been feeding on the grassy uplands, I observed large patches, which presented a dried and burnt-up appearance, and which was caused by these "army worms" eating the grass right down to the very roots. Sometimes while walking I found it quite unpleasant, as it was impossible to avoid crushing dozens of them at every step.

No. 226. *Botys?* (new species?) Honolulu. June, 1873. —This species also occurs in immense numbers, and is said to commit almost as much damage as the "army worm." They were not confined to any particular locality, but were found everywhere, from the gardens in the town to the summits of the lofty hills behind. The larvæ are of a dirty white colour, with shining, reddish brown heads, and when touched they wriggle themselves backwards vigorously. In their habits they appeared to be semi-subterranean, as I found them feeding on the root of grasses just on the level with the surface of the ground, and they also feed, I was told, on a variety of garden and other plants. Pupæ of this species, which I obtained under stones, were enclosed in a slight silken web, and were of a pale reddish brown, and I bred several of the perfect insects.

GERVASE F. MATHEW.

H.M.S. "Repulse." At sea.
Lat. 46° 39′ N. Long. 140° 18′ W.
July 19, 1873.

Captures of Hymenoptera in 1873. By F. SMITH, Esq.

FOR the information of entomologists who may be interested in the study of the aculeate Hymenoptera of Great Britain, I publish a record of the capture of species made during the

past year; also the localities, and names of the captors. I may also repeat that which I stated a few years ago, and which has been fully corroborated by Mr. John B. Bridgman, of Norwich, that the neighbourhood of that city is one of the richest localities for Hymenoptera in Great Britain, particularly Mousehold Heath, where the gentleman named has captured the species of which a list is appended. This, it should be observed, was the first season of his collecting the order.

*Captures on Mousehold Heath, near Norwich.**—Hedychrum lucidum* (July), Tiphia femorata* (August), Pompilus fuscus (April), Ammophila sabulosa (April), A. viatica (April), A. lutaria* (April), Gorytes mystaceus (June), Crabro cribrarius (June), C. patellatus (June), Oxybelus mucronatus,* O. uniglumis, Diodontus minutus, D. luperus, Passalæcus insignis, P. cornigera, Cemonus unicolor, C. lethifer, Cerceris labiata,* C. ornata, Colletes succincta, C. Daviesana, Prosopis signata, P. hyalinata, Sphecodes gibbus, S. rufescens, S. ephippia, Halictus rubicundus, H. leucozonius, H. cylindricus, H. albipes, H. Tumulorum, H. minutissimus, Andrena cingulata, A. thoracica,* A. vitrea,** A. albicans, A. helvola, A. varians, A. atriceps, A. nigroænea, A. Trimmerana, A. bimaculata,** A. nigriceps,* A. angustior, A. tridentata,* A. minutula, A. Afzeliella, A. convexiuscula, A. xanthura, Cilissa hœmorrhoidalis,* Panurgus Banksianus, Nomada ruficornis, N. furva, N. lineola, N. Solidaginis, N. alternata, N. succincta, Epeolus variegatus, Cœlioxys simplex, Melecta armata, Osmia ænea, Megachile centuncularis, M. maritima,* Anthidium manicatum, Anthophora retusa, A. Acervorum, Bombus Muscorum, B. Derhamellus, B. Pratorum, B. Lucorum, B. terrestris, B. lapidarius, B. Latreillellus, B. subterraneus, Apathus rupestris, A. vestalis, A. campestris, A. Barbutellus.

Another excellent locality is Little Hamptou, in Sussex. I have frequently recorded the capture of rarities at this locality, and I now give a list of species, taken in August last by Mr. Edward Saunders.

Captures at Little Hampton.—Myrmosa melanocephala, Pompilus exaltatus, P. agilis, P. pectinipes, P. plumbeus,* Tachytes pompiliformis, Astata stigma,** Ammophila viatica, Cerceris arenaria, Mimesa bicolor, Pemphredon lugubris,

* Local species marked with a *; rare species, **.

Crabro leucostoma, Stigmus pendulus,* Oxybelus uniglumis, Crabro brevis, Nysson dimidiatus,* Chrysis ignita, Hedychrum ardens, Prosopis hyalinatus, P. annularis, Colletes fodiens, C. Daviesana, Halictus prasinus, H. albipes, H. cylindricus, H. Tumulorum, H. longulus, H. minutissimus, H. rubicundus, H. leucozonius, H. villosulus, H. morio, H. minutus, Andrena labialis, A. Coitana, A. nana, A. fulvicrus, Megachile argentata,* M. centuncularis, Nomada flavoguttata, Cilissa leporina.*

Captures in the Island of Anglesea.—The following list of species of aculeate Hymenoptera will prove to possess some degree of interest, from the fact of its being probably the first of such as inhabit the island of Anglesea. It is certainly a very incomplete record of the Hymenopterous Fauna of the island. During the month of August last I was resident at Garth (Bangor), North Wales, but had few opportunities of collecting, as, with the exception of about four days, rain fell heavily during portions of all the rest. All the species enumerated were captured along the road-side, between Garth Ferry and Beaumaris:—Formica rufa, F. fusca, F. flava, Myrmica ruginodis, M. scabrinodis, Pompilus gibbus, Ammophila sabulosa, Crabro dimidiata, Mimesa bicolor, Harpactus tumidus, Mellinus sabulosus, Vespa germanica, V. rufa, Prosopis hyalinatus, Sphecodes ephippia, Halictus minutus, H. morio, H. rubicundus, Andrena Gwynana, Apathus rupestris, A. campestris, Bombus Muscorum, B. senilis, B. Pratorum, B. Lucorum, B. terrestris, B. Hortorum, B. lapidarius.

FREDERICK SMITH.

British Museum.

Entomological Notes, Captures, &c.

Note on Eupithecia innotaria.—This distinct species, formerly in our list, has been ignored as British by recent writers, but is, nevertheless, a species well known to me, occurring at Wallasey in the larva state on mugwort, in September, along with the larva of E. succenturiata, and being occasionally taken around the sand-hills in June: this is, in my opinion, the Eupithecia egenaria of Mr. Doubleday's Catalogue; it is a variable species, like E. expallidata in form, but, unlike that species, it also varies in markings,

varying from a long, narrow-winged insect, like Fraxinata of Crewe, to the broader form of Egenaria, and varying much in the intensity of its markings from a plain dull dim colour, to a light ashy gray, with well-developed markings. My remembrance of the fine, unique specimen of Egenaria, when in Mr. Buxton's collection, was not vivid enough to warrant me in saying his insect was a large Innotaria, but I often said I thought it was so; but on seeing his specimen again about two years ago, and comparing Cheshire Innotaria with it, all doubt in my mind vanished. I possess German Innotaria, which in no way differ from English specimens in my collection, either in colour, size, or markings; that is, they, the German specimens, differ in size, colour, and markings, as do our own.—*C. S. Gregson; Rose Bank, Fletcher Grove, Edge Lane, Liverpool, January* 1, 1874.

Controlling Sex in Lepidoptera.—As bearing somewhat on the subject of "controlling sex by supply of food" in insects, it may be worth while to give the following:—During last summer I had a few larvæ of Exapate congelatella feeding on privet: as I was greatly occupied with other things they were neglected; the supply of food was very irregularly given, and short in quantity, yet the moths produced from them consisted of four males, full sized, and eleven females, some of these latter being much below the average of the species in size.—*J. E. Fletcher; Pitmaston Road, Worcester, February* 2, 1874.

Thecla Quercus with an Orange Spot.—Last autumn I took, with other specimens of purple hairstreaks, one female, which differs from all the rest, in having a wedge-shaped orange spot above the centre of each upper wing (on the upper side of the wings); the small end of the orange wedge is directed towards the tip of the wing, and the large end towards the base of the wing. Is this an unusual variety? It can hardly be a distinct species. I also took, by beating some oaks, two larvæ of S. Fagi, and from birch two larvæ which were more like D. pudibunda than any other species that I am acquainted with, but they were of a grayish brown colour (instead of a pale greenish yellow), with black incisions, and golden brown tufts on 5th to 8th segments, and a purple tuft on 12th segment. Is this a variety of D. pudibunda?—*Frank Norgate; Sparham, Norwich, December* 29, 1873.

[Mr. Doubleday, to whom I have shown the note, considers

the presence of the orange spot accidental. He does not mention ever having seen such a variety. It may be observed that the late Mr. J. F. Stephens transposed the sexes of this butterfly, describing male for female, and *vice versâ*. The variety of Pudibunda is not very uncommon; such specimens are generally late ones.—*Edward Newman.*]

Variety of Anthocharis Cardamines.—I am indebted to Mr. C. S. Gregson for the loan of this very abnormal specimen. Hemigynous specimens of this pretty species are uncommon, but the sexes are usually separated at a mesial line passing longitudinally down the body. This specimen is much more remarkable: on the upper side the left fore wing is entirely male, the right fore wing entirely female; the hind wings are normal in colour. On the under side the left fore wing is male, a pure white stripe occupying nearly the whole of the costal margin, and a second white stripe passing nearly through the middle of the wing, but being interrupted by the central black spot; the right fore wing is entirely female; the hind wings are normal in markings. The peculiarity to which I particularly wish to invite attention, is that either wing should be male on one side and female on the other. The difficulty of representing the colour induced me to abandon my intention of giving a figure.—*Edward Newman.*

Nest-building Hymenoptera.—Last season, when on an entomological ramble in the New Forest, I found a wasp's-nest suspended from the branch of a beech shrub, about eighteen inches from the ground. It was of a globular form, nearly as large as a man's head, and of a grayish hue in colour. A closer inspection convinced me that the inmates of this "nest" had no notion of my taking away their home, much as I wished to possess it. This took place in July, so I determined to leave it till the end of the summer; but a subsequent visit revealed the fact of its having been torn to pieces by some creature,—possibly a honey buzzard, as I saw one of those noble birds not far from the spot where I first found the "nest." A few days ago I was in the meadows, and in the grass I saw what I at first supposed was a mouse's nest: I took it in my hand, and at the same time I fancied I heard a buzzing inside the ball-like structure. Having pulled it to pieces, a humble bee of a yellowish colour made its escape, and in the centre of the nest—which was chiefly

composed of the cottony flowers of the "spear"—was a single cup-shaped waxen cell, nearly half an inch in diameter. The humble bee, after making its escape from the soft mass of material I held in my hand, circled round my head a few times in the air, and then went directly to the spot in the grass where I had taken the "nest" from, at the same time buzzing loudly, and being apparently in great agitation as it settled, and ran about amongst the blades of grass. Having no net with me I could not capture it. I have before seen similar occurrences to both I have here briefly described, so that the facts are as "old as the hills;" but may I ask what is the name of the respective builders, and did the humble bee construct the nest itself?—*G. B. Corbin.*

[The larger nest, the wasp's, was probably that of Vespa britannica; the smaller one, a bee's, that of Bombus Sylvarum.—*Edward Newman.*]

Note on Megastigmus.—As I believe I have lately made two mistakes in stating that Megastigmus giganteus occurs in England, I wish to take the first opportunity of rectifying them. The first error is in the name, M. giganteus, *Kollar:* it appears to be a synonym of Cleptes stigma, *Fabr.* (Ichneumon stigma, *Fabr.*, olim.). The second error is in the supposition that this species is a parasite of Cynips Kollari: it is a parasite of C. argentea, and differs slightly, though probably specifically, from the Megastigmus of C. Caput-Medusæ, and still more from that of C. Kollari. This last Megastigmus has followed its prey into England, and there are some other undetermined British species of the green-back group of Megastigmus.—*Francis Walker.*

Entomological Pins.—I should be obliged to any readers of the 'Entomologist' who would kindly inform me where I can obtain pins measuring two-thirds of an inch in length, and of the stoutness of No. 10. I have met with several pins of the size, but have failed to find out whence they were obtained.—*J. E. Fletcher; Pitmaston Road, Worcester.*

Proceedings of the South London Entomological Society, January 29th and February 11th, 1874.

Donations announced.

Sir John Lubbock's work on the 'Collembola and Thysanura;' from the author.

Kirby and Spence's 'Introduction to Entomology;' Mr. Newman.

Exhibitions.

By the President, specimens of the rare Eupithecia Irriguata and Consignata.

Mr. C. G. Barrett, some striking varieties of Russata and Immanata.

Mr. O. E. Janson, a specimen of Agestrata orichalcea, from Borneo, with *eight* legs; also five examples of the "learned beetle" Hypothenemus eruditus: this species was described by Professor Westwood forty years ago, and has not been recorded since. Mr. Janson found his specimens in the cover of a book, which was produced at the meeting.

Mr. Champion, specimens of Euryporus picipes, Lathrobium angustatum, Liosomus oblongulus, L. Troglodytes from Faversham; also Cicones variegatus from Loughton; and Melasis buprestoides, Strachia ornata (1), Conurus litoreus, Bolitobius undulata, and other species, captured at Chatham by Mr. J. J. Walker, of Sheerness.

Mr. Bull, Stenus major, and Anchomenus scitulus, taken at Putney.

Paper read.

By Mr. Power, on the "Scales of the genus Phyllobius." He gave a description of the shape and sculpture of the scales when viewed under a microscope, and showed that each species could readily be distinguished by the scales highly magnified figures were exhibited.—*J. P. Barrett.*

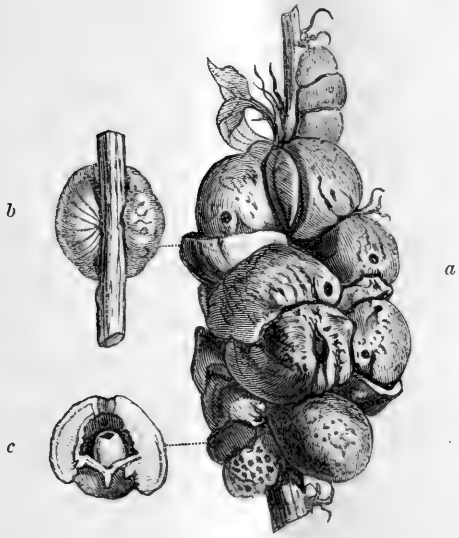
Newcastle-on-Tyne Entomological Society.—The annual meeting was held, on February 3rd, in the museum of the Natural History Society, Mr. J. Hancock in the chair, who exhibited two cases of Lepidoptera in fine preservation, collected by himself in Switzerland during the summer of 1844; also some fine specimens of beetles and moths from Africa and South America. Mr. F. Raine exhibited specimens of V. Antiopa, taken at Durham and Helmsly in 1872; A. melanopa and other species, taken at Rannoch in 1873; also several fine varieties, and a quantity of preserved larvæ. W. Maling, Esq., was re-elected President.—*J. Hamilton, Secretary;* 13, *Union Street, Newcastle, February* 13, 1874.

THE ENTOMOLOGIST.

No. 128.] APRIL, MDCCCLXXIV. [PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

Fig. 6.



CYNIPS CERRICOLA: *a.* CLUSTER OF GALLS. *b.* SINGLE GALL SEEN FROM BEHIND. *c.* SECTION OF THE SAME.

Cynips cerricola.—Notwithstanding the dissimilarity in size and shape which is observable among specimens of this gall, and also that it is sometimes in clusters and sometimes

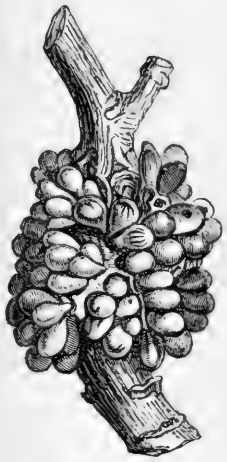
solitary, it may be easily distinguished by always occurring on the bark of the Turkish oak (Quercus Cerris) in the form of knobs, varying in size from a hempseed to a walnut. If a specimen be detached from the twig it may be plainly seen to have been growing on the woody part, seated on a very short pedicle, and to have raised up the bark in its immediate vicinity. It is found singly on the most slender young shoots, in the form of a spherical knob, or occasionally it has so enclosed the twig that its protruding sides meet exactly opposite the point of its attachment. On the larger twigs we find a great number of these galls so crowded together that each becomes flattened at the point of contact, and the mass thus formed surrounds the twig in the form of an irregular band, that sometimes extends to three centimeters in length and thickness. The longitudinal fissure in the bark, through which these galls have forced their way, may be readily perceived if one of the size of a hempseed or a pea has happened to remain undeveloped, and to grow separately on a thicker twig. The galls appear at midsummer, and are of a light green colour, and more or less clothed with a short tomentum; later in the autumn they assume a brownish yellow hue, and lose their tomentum, more especially the larger ones, whilst the immature specimens often retain it. The interior of the gall consists of a rather loose parenchyma: it is hollow in the centre, and contains a moderately large, oval, inner gall, which is seated at or near the base of the outer one; sometimes this is quite detached, at others it is loosely adherent to the substance. In the smaller specimens, which only contain parasites, this inner cell is not developed, and we frequently find, as in several other species of galls, little oval cavities, arranged in a radiating manner in the parenchyma, and these serve as homes for the parasites. This gall is not deciduous, and specimens two or three years old, and partly destroyed, may be often met with on twigs. The perfect insect emerges in December of its first year.—*G. L. Mayr.*

Cynips cerricola is accompanied by four inquilines, and the distinctive characters of these, and of others of their tribe, may be noticed on another occasion:—(1) Synergus variabilis of Mayr—it appears from March to July in the second year; (2) Synergus thaumacera of Dalman—April, second year; (3) Sapholytus undulatus of Mayr—it appears in May and

June, second year; (4) Ceroptus Cerri of Mayr—it appears from April to June, second year.—*Francis Walker.*

Dryocosmus cerriphilus.—This rare gall is also found on the young twigs of the Turkish oak (Quercus Cerris). The galls are about the size of a hempseed, and are attached to one spot in the twig, quite surrounding it, and more or less densely crowded. Each gall, by means of a short pedicle, is inserted in the bark of the twig, which, in consequence, is thickened: sometimes the pedicle becomes gradually lengthened, and the gall terminates in a spherical head, thus assuming a clavate form; the interior is occupied by a rather large larva-cell. As I have never seen the gall in a recent state, but only on a two-year-old twig, in company with similar old galls on an oak that was about eighty years of age, I should recommend the reader to seek farther information from Dr. Giraud's 'Signalements, &c., Ver. zool. bot. Ges. 1859,' p. 354.—*G. L. Mayr.*

Fig. 7.



Dryocosmus cerriphilus.

Dryocosmus cerriphilus has one inquiline, Synergus variabilis of Mayr; it appears from April to June of the second year.—*Francis Walker.*

Geographical Distribution of Continental Rhopalocera.

By the Rev. F. A. Walker, M.A., F.L.S.

In compiling the following catalogue it must be understood that I have only set down such species as fell under my own personal observation. The statistics accordingly of each locality, though greatly defective, may be relied on as far as they go.

Bellagio and its environs.—1. Papilio Machaon: gardens of Hotel Grande Bretagne, Villa Serbelloni, Villa Julia,

Villa Melzi, Villa Vigoni, and at Gorla. 2. P. Podalirius: gardens of Hotel Grande Bretagne, Villa Julia, Villa Melzi, Villa Vigoni. 3. Pieris Brassicæ: Villa Vigoni, &c. 4. P. Rapæ: Villa Vigoni, &c. 5. P. Napi: Villa Vigoni, &c. 6. Leucophasia Sinapis: at Gorla. 7. Gonepteryx Rhamni: Villa Julia. 8. Colias Edusa: gardens of Villa Serbelloni, Villa Julia, Villa Vigoni, and at Gorla. 9. C. Hyale: gardens of Villa Serbelloni, Villa Julia, Villa Vigoni, and at Gorla. 10. Limenitis Camilla: Villa Julia, on ivy blossoms. 11. Vanessa Io: Villa Julia. 12. V. Antiopa: just outside Villa Vigoni. 13. V. Cardui: Villa Serbelloni. 14. V. C-Album: lane leading to Villa Julia. 15. Argynnis Lathonia: Villa Serbelloni, and at Gorla. 16. A. Paphia: Villa Julia. 17. Melitæa Athalia: Villa Julia. 18. M. Didyma: Villa Julia. 19. Arge Galatea: at Gorla. 20. Satyrus Semele: at Gorla. 21. S. Mæra: at Gorla. 22. S. Megæra: at Gorla. 23. S. Ægeria: outside of Villa Melzi. 24. Minois Phædra: at Gorla. 25. M. Hermione: at Gorla. 26. Erebia Medea? at Gorla. 27. Chrysophanus Phlæas: Villa Julia. 28. C. ——: Villa Julia. 29. Pamphila Sao? Gorla.

Neighbourhood of Geneva.—1. Papilio Machaon: fields outside Geneva. 2. Colias Edusa: meadows adjoining the meeting of the waters. 3. C. Hyale: meadows adjoining the meeting of the waters. 4. Vanessa Atalanta: meadows adjoining the meeting of the waters. 5. V. C-Album: meadows adjoining the meeting of the waters. 6. V. Cardui: waste ground to left of Hotel des Bergues. 7. Argynnis Lathonia: waste ground in the outskirts. 8. Melitæa Athalia: waste ground to left of Hotel des Bergues. 9. M. Euphrosyne: meadows adjoining meeting of waters, and waste ground to left of Hotel des Bergues. 10. Satyrus Janira: meadows adjoining meeting of waters.

Montreux.—1. Papilio Machaon: bank at landing-place. 2. Colias Hyale: bank at landing-place. 3. Leucophasia Sinapis: bank at landing-place.

Villeneuve.—Cœnonympha Arcanius: upland meadows. 2. Arge Galatea: upland meadows. 3. Limenitis Sibylla: upland meadows.

Neighbourhood of Brussels.—1. Papilio Machaon: Sion Mount, Waterloo. 2. Argynnis Lathonia: Abbey of Villers la Ville.

Forest of Fontainbleau.—1. Argynnis Paphia. 2. A. Niobe. 3. A. Aglaia: extremely abundant along sunny drives. 4. Melitæa Athalia. 5. Limenitis Sibylla. 6. Satyrus Mæra. 7. S. Hyperanthus. 8. Cœnonympha Arcanius: extremely abundant along sunny drives. 9. Arge Galatea. 10. Thecla W-Album: extremely abundant along sunny drives. 11. Aporia Cratægi. 12. Pamphila Sylvanus.

Black Forest, Baden Baden.—1. Papilio Machaon. 2. Colias Edusa. 3. C. Hyale. 4. Vanessa Antiopa. 5. V. Prorsa (autumn type). 6. Argynnis Paphia. 7. A. Aglaia. 8. Melitæa Athalia. 9. Minois Proserpina. 10. Satyrus Ægeria. 11. S. Janira. 12. S. Mæra. 13. Polyommatus Arion. 14. P. Corydon. 15. P. Adonis. 16. P. Alexis. 17. Chrysophanus Xanthe. 18. Vanessa C-Album.

Cologne.—Colias Hyale: abundant in meadows close to suburb of Dentz.

Tiefenhasten.—1. Colias Edusa. 2. C. Hyale. 3. Satyrus Semele.

Julier Pass.—1. Colias Hyale. 2. Melitæa. 3. Erebia Pirene.

Schyn Pass.—1. Papilio Machaon. 2. Parnassius Apollo. 3. Satyrus Semele. 4. Minois Hermione(?). 5. Erebia Pirene.

Pontresina.—1. Parnassius Apollo: Piz Languard, Bernina Pass, road to Roseg glacier, and stony slopes above Pontresina. 2. Colias Edusa: stony slopes above Pontresina. 3. C. Hyale: stony slopes above Pontresina. 4. C. Phiconome: stony slopes above Pontresina, and Piz Languard. 5. Pieris Callidice(?): stony slopes above Pontresina, Piz Languard, and Bernina Pass, above Lago Rianco. 6. Argynnis Lathonia: Pontresina. 7. A. Adippe: road to Roseg glacier. 8. A. Aglaia: road to Roseg glacier. 9. Melitæa Didyma: road to Roseg glacier. 10. M. Euphrosyne: road to Roseg glacier. 11. M. Dia: Bernina Pass, and stony slopes above Pontresina. 12. Polyommatus Corydon: road to Roseg glacier. 13. P. Damon: road to Roseg glacier. 14. Chrysophanus Virgaureæ: stony slopes above Pontresina, and road to Roseg glacier. 15. Cœnonympha Philea: Piz Languard, and stony slopes above Pontresina. 16. Erebia Pirene: road leading to Roseg glacier. 17. E. Euryale: road leading to Roseg glacier. 18. E. Clio(?): road leading

to Roseg glacier. 19. E. Melampus: road leading to Roseg glacier, and road leading to Morteratsch glacier.

Chamounix.—1. Parnassius Apollo. 2. Aporia Cratægi: road by Geneva to Chamounix. 3. Cœnonympha Philea: Col de Voza. 4. Erebia Pirene. 5. E. Euryale. 6. E. Melampus. 7. E. Manto: Col de Voza and Montauvert. 8. E. ——? Jardin, Mer de Glace. 9. Satyrus Mæra: neighbourhood of Chamounix. 10. Polyommatus Corydon: road by Geneva to Chamounix. 11. P. Damon: road by Geneva to Chamounix. 12. Chrysophanus Dorilis: Chamounix. 13. C. Virgaureæ: Chamounix. 14. C. Chryseis: Chamounix. 15. Thecla Betulæ: Chamounix. 16. Pamphila Comma: Chamounix. 17. Argynnis Niobe: Chamounix.

Martigny.—1. Papilio Machaon: road between Martigny and Great St. Bernard. 2. P. Podalirius: road between Martigny and Sion, hovering over muddy puddles. 3. Parnassius Apollo: road between Martigny and Great St. Bernard. 4. Colias Edusa: road between Martigny and Great St. Bernard. 5. C. Hyale: road between Martigny and Great St. Bernard. 6. Leucophasia Sinapis: osier beds, near Martigny. 7. Limenitis Camilla: road between Martigny and Great St. Bernard. 8. Minois Actæa: road between Martigny and Great St. Bernard. 9. M. Hermione: cliffs near Martigny, and road between Martigny and Great St. Bernard. 10. Erebia Euryale: road between Martigny and Great St. Bernard. 11. E. Pirene: ditto. 12. E. Stygne: ditto. 13. E. Goante: ditto. 14. E. Melampus: ditto. 15. E. Neleus: ditto. 16. E. Mnestra: ditto. 17. E. Clio (?): ditto. 18. E. Gorge (?): ditto. 19. Satyrus Hiera: ditto. 20. S. Lycaon: ditto. 21. S. Mæra: ditto. 22. S. Semele: ditto. 23. Polyommatus Corydon: road between Martigny and Great St. Bernard, abundant hovering over muddy puddles. 24. P. Damon: road between Martigny and Great St. Bernard. 25. Chrysophanus Virgaureæ: road between Martigny and Great St. Bernard, frequent on wild thyme. 26. C. Chryseis: road between Martigny and Great St. Bernard. 27. Erebia Manto. 28. Melitæa Didyma. 29. M. Amathusia. 30. M. Phœbe. And 31. M. ——? ditto. 32. Vanessa C-Album: road between Martigny and Great St. Bernard, and near railway station, Martigny. 33. Pamphilus Comma: road between Martigny and Great St. Bernard.

34. Argynnis Niobe: road between Martigny and Great St. Bernard.

Sion.—1. Papilio Podalirius: steep rocks by Castle of Sion. 2. Pieris Daplidice: steep rocks by Castle of Sion. 3. Minois Actæa: steep rocks by Castle of Sion.

Jersey.—1. Pieris Daplidice: St. Ouen's Bay. 2. Argynnis Lathonia: St. Ouen's Bay. 3. Satyrus Mæra.

Wiesbaden.—1. Gonepteryx Rhamni: Russian cemetery.

Venice.—1. Colias Edusa: Botanical Gardens. 2. Vanessa Cardui: Botanical Gardens.

St. Malo.—1. Papilio Machaon.

Lucerne.—1. Argynnis Lathonia. 2. Vanessa Cardui.

It remains for me merely to supplement the above very fragmentary data by stating that, as far as my own success in collecting is concerned, I decidedly give the preference to the Vallais over any other district. The foregoing facts stand for what they are worth. My knowledge is too imperfect, and my stay was too limited, in the localities mentioned, for me to attempt an elaborate generalization, as regards the widespread range of certain species, and the local occurrence or total absence of others.

F. A. Walker.

Entomological Notes, Captures, &c.

Notes on the Red and Blue Varieties of Œdipoda Germanica.—So far as my very imperfect knowledge of this insect extends, its red and blue varieties are about equally common, occurring, however, by no means in the same proportion in each place, as while travelling on the Continent I have observed the red alone almost exclusively in one spot, and similarly the blue in another; while in a third locality I have noticed both forms, though not in equal plenty. But as mine are necessarily hurried notes of a passer through the different countries where I remarked the said grasshopper, as, for example, Germany, Switzerland, Italy, and Corsica, it is not at all improbable but that a longer investigation, as well as a more careful and further extended search, would succeed in discovering the red, where I only found the blue, and *vice versâ*. The fact that both varieties are undoubtedly found in one and the same place, would seem to preclude

altogether the idea which I once entertained, that their respective tints were adapted, for the purpose of self-protection and disguise, to the particular colour of the soil that they inhabited. Notwithstanding, there is no ground, I should imagine, for supposing that the discrepancy of their hues constitutes them two distinct species, inasmuch as we possess a similar instance of various colouring in the Heliconius Doris, of the Amazon region, where *var.* A has the stripes on the lower wings of a bright brick-red, and *var.* B of a slaty blue. I may remark that the upper wings of both varieties are of very different shades, in the case of several specimens that I observed and captured, being sometimes of a uniform dark hue, occasionally variously mottled, and others, again, indistinguishable in colour from the dust of the road on which they were settled: a familiar instance in point, I may observe, is furnished by the numerous tints of the upper wings of our own common yellow underwing (Pronuba). O. Germanica presents the same number of different tints of upper wing, as far as I am aware, in red and blue varieties alike, nor is there any mark in the said wings whereby one may determine which of the two it is, until the insect is disturbed, and flies upwards from its resting-place. However, it may be noteworthy to add, with regard to the specimens in my own collection, that a uniform dark tint is the most frequent form of the upper wing of the red variety, whereas that of the blue is more often variously mottled. I myself possess two specimens of the red variety having the upper wings mottled, but none of the blue that, in this respect, are dark. But it is very likely that a series of this same insect in another cabinet may tell a widely different tale, in reference to the above particulars. I have now only one more point to notice, namely, that in all my specimens of the red variety the black band, which borders the red in the lower wings, extends to the extreme margin of the same, whereas in the blue, without exception, beyond the same black band, there is always "a transparent piece of network." I subjoin a list of localities, where I have noticed both varieties of this insect:—Black Forest, Baden Baden, August, 1857, only blue variety. Mount Pilate, October, 1865, only red variety. Pontresina, September, 1872, only red variety. Road to Roseg Glacier, August, 1872, only red variety. Geneva, August, 1872, a few

of blue variety. Gorta (near Bellaggio), September, 1872, a few red; mostly blue. Villa Julia, Bellaggio, September, 1872, only blue variety. Julier Pass, August, 1872, red and blue varieties. Thusis, September, 1272, red and blue varieties; red if anything more abundant. Lido, Venice, October, 1872, only blue variety. Pineta, Ravenna, October, 1872, only blue variety. Bastia, October, 1872, red and blue varieties. Ajaccio, October and November, 1872, red and blue varieties; the red with only partially-developed wings, notwithstanding the lateness of the season.—[*Rev.*] *F. Augustus Walker, M.A.; Dry Drayton Rectory, Cambridge.*

Cnethocampa pityocampa said to occur in Kent.—You will doubtless recollect a communication I made to you some months ago respecting some strange pupæ which I found, and the fritillary butterflies which I caught. I regretted that I could not submit them to you at the time, as I had such a number of applicants, and such tempting offers, that I had exchanged them away before I saw them announced in your magazine, as I did not get the 'Entomologist' for that month until the 14th, through a blunder, which the bookseller, who supplies me with it, made: he got me the 'Entomologist's Monthly Magazine,' which, though perhaps more scientific, is not nearly so suitable as yours for a young beginner in my position. I have now found a number of some gregarious larvæ, which appear to be of the same kind as the pupæ were, as their cast skins resembled these, and they were in the same clump of trees, and in pine trees in two other spots in this neighbourhood, and I herewith send a few for your examination: some of them are much larger than these, but these are the only ones at present outside of the silk nests they spin for themselves. I shall be extremely obliged if you can inform me if they really are B. processionea. Last summer I found a number of strange pupæ in an old magpie's nest (Entom. vi. 487), which I showed to an acquaintance, then living at Tunbridge Wells, who had several fine cases of moths, and he told me that he thought my pupæ were B. processionea, and showed me a moth which he called by that name. Some time afterwards one of my pupæ emerged, and the moth was like it, but smaller and paler. On the 15th of this month, last Sunday, I found some strange gregarious larvæ, inhabiting

large silken nests, on the same pine tree as I found the pupæ, and they are just like the cast skins that were with the above pupæ; and I took some more, in a fresh spot, on the 17th: they are the most curious and eccentric creatures I ever saw. I keep them in an open box, which they do not seem inclined to leave; and whenever they move about they arrange themselves in the most perfect lines or processions, generally singly; but this morning a large number of them were moving about, four abreast, with the most perfect regularity over the pine branches I have given them to feed upon, and which they have already enveloped in a mass of very tough white silk. They are of a grayish black ground colour, with pale rings, arranged something like the rings on the larvæ of Carpini: these rings are clothed thinly along the sides with long white hairs, and along the back they are thickly set with tufts of short hair of a bright orange colour; the head is large, black, round, and rather oily-looking. This is the description of the largest, but they vary in appearance, as well as in size. They are most voracious eaters, and consume large quantities of pine or Scotch fir.—*T. Batchelor; Yew Tree Farm, Southborough, Kent, February* 18, 1874.

PS. *March* 14.—The places where I find these larvæ are some distance along the Penshurst Road: their head-quarters is a wood of pine trees, called Ashew Wood, on a farm in the occupation of my uncle; the firs are now being cut down, and I find these larvæ on the top and upper branches of the fallen trees.—*T. B.*

Cnethocampa pityocampa said to occur in Kent.—I shall be greatly obliged if you will tell me the name of the enclosed larva. I cannot find any description which at all accords with them in your 'British Moths.' I found them on the 4th, feeding in batches, under cover of a white web, on some fir trees, on Seal Chart, about three miles from Sevenoaks.—*W. Peyton; Seal, near Sevenoaks, Kent, March* 6, 1874.

[I have printed these letters without altering a single word, because I desire not to prejudice the case by any opinion of mine. Mr. Doubleday has kindly given me the name of the larvæ. Both instalments are of the same species: it is Cnethocampa pityocampa. It assumes the pupa state singly, on or just below the surface of the earth, in a cocoon resembling that of the Cucullia. Mr. Doubleday

adds that C. processionea spins up gregariously, in the web previously inhabited by the caterpillar. I think it may be interesting to add a few references to the history of Cnethocampa pityocampa. 1. Pliny, (C.S.) 'Historia mundi naturalis,' lib. xxxviii. c. 9. 2. Mouffet, 'Theatrum,' p. 185. 3. Amoreux (P. J.), 'Notice des Insectes de la France reputé Venimeux,' p. 158. 4. Kirby and Spence, 'Introduction to Entomology,' vol. i. p. 131: "Of this nature also is the famous Pityocampa of the ancients, the moth of the fir Lasiocampa pityocampa, the hairs of which are said to occasion a very intense degree of pain, fever, heat, itching and restlessness. It was accounted by the Romans a very deleterious poison, as is evident from the circumstance of the Cornelian law, 'de Sicariis,' being extended to persons who administer Pityocampa." Again, Kirby and Spence, 'I. E.' vol. ii. p. 22: "Equally amusing is the progress of another moth, the Pityocampa, before noticed. They march together from their common citadel, consisting of pine leaves united and interwoven with silk which they spin, in a single line, thus forming a series of living wreaths, which change their shape every moment: all move with a uniform pace, no one pressing too forward, or loitering behind; when one stops, all stop, each defiling in exact military order." And Réaumur suggests that the singular anal patch of scales, resembling those of the wings, but considerably larger, which is found in the female of Cnethocampa pityocampa, is destined for the purpose of covering her eggs. 5. Stephens, in his 'Illustrations of British Entomology, Haustellata,' vol. ii. p. 48, has described Cnethocampa pityocampa as a British insect, on the authority of a stunted specimen in the British Museum, said to have been taken in Devonshire by the late Dr. Leach. I ought to add that the account given by Mouffet in 1634, to which I have referred above, is well worth an attentive perusal, not only as a specimen of minute and accurate description, but also as showing how ably and elegantly the Latin language was employed in Natural History a century before the invention of what is called the "language of Science."—*Edward Newman.*]

Swarming of a Brood of Winged Ants.—On the afternoon of October 6th, at about 4 P.M., we were attracted to a part of the large yard surrounding our home by a multitude of

large-sized insects that filled the air, and appeared to be some unusual form of insect-life, judging of them from a distance. On closer inspection these creatures proved to be a brood of red ants (Formica) that had just emerged from their under-ground home, and were now for the first time using their delicate wings. The sky, at the time, was wholly overcast; the wind strong, south-east; thermometer 66° Fahr. Taking a favourable position near the mass, as they slowly crawled from the ground up the blades of grass and stems of clover and small weeds, we noticed, first, that they seemed dazed, without any method in their movements, save an ill-defined impression that they must go somewhere. Again, they were pushed forward usually by those coming on after them, which seemed to add to their confusion. As a brood or colony of insects their every movement indicated that they were wholly ill at ease. Once at the end of a blade of grass, they seemed even more puzzled as to what to do. If not followed by a fellow ant, as was usually the case, they would invariably crawl down again to the earth, and sometimes repeat this movement until a new comer followed in the ascent, when the *uncertain* individual would be forced to use his wings. This flight would be inaugurated by a very rapid buzzing of the wings, as though to dry them, or prove their owner's power over them; but which, it is difficult to say. After a short rest the violent movement of the wings would recommence, and finally losing fear, as it were, the ant would let go his hold upon the blade of grass and rise slowly upwards. It could, in fact, scarcely be called flight. The steady vibration of the wings simply bore them upwards, ten, twenty, or thirty feet, until they were caught by a breeze, or by the steadier wind that was moving at an elevation equal to the height of the surrounding pine and spruce trees. So far as we were able to discover, their wings were of the same use to them, in transporting them from their former home, that the "wings" of many seeds are,—in scattering them; both are wholly at the mercy of the winds. Mr. Bates, in describing the habits of the Saüba ants (Œcodoma cephalotes), says ('Naturalist on the River Amazons,' vol. i. p. 32):—"The successful *début* of the winged males and females depends likewise on the workers. It is amusing to see the activity and excitement which reign in an ant's nest when the

exodus of the winged individuals is taking place. The workers clear the roads of exit, and show the most lively interest in their departure, although it is highly improbable that any of them will return to the same colony. The swarming or exodus of the winged males and females of the Saüba ant takes place in January and February, that is, at the commencement of the rainy season. They come out in the evening in vast numbers, causing quite a commotion in the streets and lanes." We have quoted this passage from Mr. Bates' fascinating book because of the great similarity and dissimilarity in the movements of the two species at this period of their existence. Remembering, at the time, the above remarks concerning the South American species, we looked carefully for the workers, in this instance, and failed to discover above a dozen wingless ants above ground, and these were plodding about very indifferent, as it appeared to us, to the fate or welfare of their winged brothers. On digging down a few inches we could find but comparatively few individuals in the nest, and could detect no movements on their parts that referred to the exodus of winged individuals then going on. On the other hand, the time of day agrees with the remarks of Mr. Bates. When we first noticed them, about 4 P.M., they had probably just commenced their "flight." It continued until nearly 7 P.M., or a considerable time after sundown. The next morning there was not an individual, winged or wingless, to be seen above ground; the nest itself was comparatively empty; and what few occupants there were seemed to be in a semi-torpid condition. Were they simply resting after the fatigue and excitement of yesterday? It was not possible for us to calculate what proportion of these winged ants were carried by the wind too far to return to their old home; but certainly a large proportion were caught by the surrounding trees; and we found, on search, some of these crawling down the trunks of the trees with their wings in a damaged condition. How near the trees must be for them to reach their old home we should like to learn; and what tells them "which road to take?" Dr. Duncan states ('Transformations of Insects,' p. 205):—"It was formerly supposed that the females which alighted at a great distance from their old nests returned again, but Huber, having great doubts upon this subject

found that some of them, after having left the males, fell on to the ground in out-of-the-way places, whence they could not possibly return to the original nest!" We unfortunately did not note the sex of those individuals that we intercepted in their return (?) trip; but we cannot help expressing our belief that, at least, in this case, there was scarcely an appreciable amount of "returning" on the part of those whose exodus we have just described, although so many were caught by the nearer trees and shrubbery. Is it probable that these insects could find their way to a small under-ground nest, where there was no "travel" in the vicinity, other than the steady departure of individuals, who, like themselves, were terribly bothered with the wings they were carrying about with them?—*C. C. Abbott; from the 'American Naturalist.'*

Hints on Breeding Tæniocampa opima, &c.—As very many have failed to breed this species from the egg, possibly a short account of the method I have found very successful may be interesting to some: from a batch of eggs, kindly sent by Mr. Owen, of Liverpool, April, 1873, about a hundred larvæ hatched on May 15th. They were placed in a three-ounce wide-mouth bottle, with sprigs of broad-leaved willow: tie over the mouth of the bottle with fine muslin, and then place it mouth downwards on a shelf; this keeps the food fresh, and allows a little air to enter. I found that a bottle loosely filled with suitable sprigs kept perfectly fresh for a week; now, as the young larvæ spin a quantity of silken galleries, in which they rest and change their skins, it is rather difficult to change their food without disturbing them, and to avoid this, having filled a second bottle of the same size and character with food, untie and remove the muslin from the neck of the first bottle, and place the two bottles neck to neck. Securing them in this position, by binding a strip of muslin two inches wide tightly round the rims of them, the larvæ can now crawl from the stale to the fresh food, without injuring or disturbing those that may be changing their skins. After two or three days remove the first bottle, and clean it out carefully, for repeating the process when required. After the second change of skin it was necessary to divide my family into two separate bottles, and work as before. After the third change, procure a large

earthen shallow pan, such as is used to stand flower-pots in, and a horticultural glass to fit on it,—*a bee glass is best;* half-fill the shallow pan with tolerably dry earth, on which to rest the glass cover, and prevent escape of larvæ. The food is plunged into wet sand contained in one of the smallest-sized flower-pots, and pressed into the mould of the pan to keep it steady, and introduce a layer of loose dry moss over the mould inside the glass: this is important, as after the fourth change the larvæ leave the food during the day, and hide under the moss. By having a duplicate small flower-pot of wet sand stuck full of fresh *mature* willow sprigs (I found young succulent twigs droop directly), removing your glass, and introducing the fresh pot of food, the change is done quickly, without irritation to the caterpillars. By following this process I succeeded in getting over ninety fine pupæ, not losing more than eight or ten from the egg. Owing possibly to my want of care in not baking the earth I had placed for their pupation, the chrysalids were attacked by a fungus, a species of Sphæria, which destroyed a great many before I discovered it; but, by carefully washing them under running water, I have now the satisfaction of breeding some beautiful specimens for my pains. The quantity of leaves my family ate was extraordinary; I never fed so voracious a lot before. I had to walk two miles *out* to get good food for them, making four miles each time, and had to repeat my walk ten times: they gave me altogether a forty miles journey. The introducing moss with the food-plant of Noctuæ larvæ I find generally very successful. I bred Agrotis agathina so, last August, getting a fine series. There may be no novelty in the plan of breeding sketched out, but I can say that it answers well. *Mem.*—Never place either larvæ or pupæ, when under the bee or horticultural glass, in the direct ray of the sun, as too much heat is collected. This I proved to my cost, killing one hundred or more pupæ of Geminipuncta by so doing.—*W. H. Tugwell;* 3, *Lewisham Road, Greenwich, S.E.*

Eupithecia innotata and E. egenaria (Entom. vii. 68).—Although too unwell to pay much attention to Entomology at the present time, I will pen a short reply to Mr. Gregson's note upon Eupithecia innotata and E. egenaria. I introduced Innotata into our lists on the authority of worn specimens

given to me by the late Mr. Paget, of Yarmouth. The late M. Becker saw these specimens the first time he paid me a visit, and said they were Innotata. He promised to send me German specimens, which he did soon after his return home, and they appeared to agree with those captured by Mr. Paget. Some years afterwards my friend, the Rev. H. Harpur Crewe, bred a closely-allied species from larvæ found on ash, which he named Fraxinata. I then thought it possible that Mr. Paget's insects were this species, but I still entertained a suspicion that M. Becker was right, and mentioned this to some of my friends, and I think to Mr. Gregson some years ago. I also said that the larvæ should be looked for on Artemisia campestris, which grows abundantly on the sandy heaths of Norfolk and Suffolk. I have bred Innotata from larvæ sent me, from Cannes, by M. Millière. If Mr. Gregson has known for years that this species is found in Norfolk, I am rather surprised that he has withheld the information so long from his friends. I am quite certain that the Eupithecia which Mr. Buxton sent me was not Innotata: it was not a "fine" specimen, one of the superior wings being considerably damaged. I looked over Herrich-Schæffer's figures of Eupithecia, and it appeared to me to agree better with that of Egenaria than any other species. I then sent it to my friend M. Guenée, who said that as far as he could judge from a single specimen it was new to him, and that he had never seen Egenaria. I then sent it to Herrich-Schæffer himself, and he said it was his Egenaria, an insect of which very little is known, as Dr. Staudinger doubtingly gives it as a variety of Arceuthata.—*Henry Doubleday; Epping, March* 18, 1874.

Argynnis Niobe.—Mr. Doubleday has called my attention to a statement at p. 154 of the 'Entomologist's Annual' for 1874, to the effect that as yet there is no evidence of the female of Argynnis Niobe occurring in this country, whereas *all* the reputed British specimens of Niobe are females: the sexes are very different, and do not assimilate like the sexes of Adippe. I believe all the reputed specimens of Niobe have passed through my hands, some of them while still living, and certainly they were females.—*Edward Newman.*

Syntomis Phegea as a British Insect.—The writer of an article in the 'Entomologist's Annual' for 1874, p. 155, has

erroneously assumed the Mr. J. G. Batchelor, jun., who captured S. Phegea, near Folkestone, in 1872, to be the same gentleman as Mr. T. Batchelor, of Yew Tree Farm, Southborough, Kent, who last year reported A. Dia and B. processionea from his locality, and the writer *implies* a doubt as to the genuineness of his statement. As I have personally known Mr. J. G. Batchelor, of Reigate, for some twenty years, I can fully vouch for the fact of S. Phegea being actually taken as reported below, in his own words, in answer to a letter of mine, asking details of his capture. He writes me:—"I took it (Phegea) on the coast, between Folkestone and Dover, on the wing, about half-past twelve o'clock, July 24, 1872, weather bright and hot; if it had not been for the yellow band on the insect, I do not suppose I should have taken any notice of it, as only butterflies and the larger moths attract any attention from me." Although this may be a unique and unlooked-for capture in England, there is not the slightest doubt as to the fact as reported.—*W. H. Tugwell; Greenwich, March* 23, 1874.

Butterflies in Newfoundland at Christmas.—Twelve months since I chronicled in the 'Field' newspaper four species of butterflies, namely, V. Io, V. Polychloros, V. Urticæ, and G. Rhamni, on wing here, on December 26th. A short time since I heard from one of the settlers at Cow Head, Newfoundland, who incidentally mentioned that "last Christmas Day (1872) a shower of white butterflies fell" there! This, therefore, is the day preceding that on which the butterflies were observed on wing in this neighbourhood. My informant unfortunately neglected to note the temperature, although I left a thermometer there expressly for that purpose. Of course the weather must have been remarkably mild. The mean temperature of that part of Newfoundland at Christmas would average about 15° above zero.—*Henry Reeks.*

Vanessa Polychloros in Northumberland.—I have the pleasure to report the occurrence of the large tortoiseshell butterfly (Vanessa Polychloros) in this county. A specimen was found yesterday (March 20th) by Mr. M. Henderson, of this town, on the floor of the chapel in All Saints' Cemetery, near the town. When I saw it to-day it was in a semi-dormant state, and had no doubt hybernated among the rafters in the roof of the chapel. I believe this is the only really authentic capture of this butterfly in the county of

Northumberland; and the neighbouring county of Durham can only boast of two instances in which it has been met with, namely, at Whitburn, by Mr. John Hancock, on July 23rd, 1858, and by Mr. J. Sang, at Darlington.—*W. Maling; 22, Jesmond Road, Newcastle-on-Tyne, March* 21, 1874.

Description of the Larva of Zygæna Trifolii.—Early in July last I received a number of cocoons and three larvæ of this species from the Rev. A. C. Hervey, of Pokesdown. The latter were of the usual Zygæna shape; when at rest about five-eighths, but when crawling nearly an inch in length. Ground colour yellowish green; the head black and shining, with a streak of gray above the mandibles. There are two longitudinal rows of black marks on the dorsal area, each segment containing four of these marks; there is another row of similar, but smaller, marks between the subdorsal and spiracular regions; and an interrupted smoky stripe along the region of the spiracles. The segmental divisions are yellow, and expand into conspicuous yellow marks along the sides, these marks being on the posterior [part] of each segment, between the two rows of black marks. The ventral surface is dingy, yellowish green, with smoky central line. Skin soft, and clothed sparingly with very short gray hairs. Moths emerged during the latter part of July.—*Geo. T. Porritt; Huddersfield, January* 9, 1874.

[Will Mr. Porritt kindly inform the readers of the 'Entomologist' how these larvæ may be preserved through the winter? I have often hatched the eggs of a five-spot burnet, and have watched their entrance into this world, and found they will immediately distribute themselves over the leaves of any leguminous plant provided for them; this lasts for a few days only: if you hold up the food on which they are feeding and give it a sharp tap, the infant larvæ fall about five or six inches, but always secure themselves by a thread, and thus swing suspended like a family of recently-hatched spiders. They soon regain their standing, and nibble little holes in the leaves; but I have always lost them in the winter.—*Edward Newman.*]

Halonota Grandævana at Hartlepool.—A few months ago Mr. Gardner, of Hartlepool, sent a box of Micro-Lepidoptera for my acceptance: among them was a specimen of Grandævana; it appears rather an old one, and no doubt it has been in existence before the species was

added to our list. I had placed it among my Pœcilochroma as a new species, until I sent it to Mr. Stainton, and he returned it as H. Grandævana.—*J. B. Hodgkinson;* 15, *Spring Bank, Preston, March* 7, 1874.

Phigalia pilosaria.—One emerged on the 7th and another on the 14th inst. Mr. Newman says the larva feeds upon the oak, but what I have taken in pupæ have been dug up from under the elm, as I keep them all in separate boxes. I believe the larvæ are pinkish brown, but of that I am not quite certain at present.—*S. Bradbury; Uttoxeter.*

[I have received specimens of Phigalia pilosaria at rather unusual dates during the past winter: one in November, three in December, two in January, and several in February. —*Edward Newman.*]

Testaceous Specimen of Hylurgus piniperda.—On the 5th September, 1873, I found an entirely testaceous specimen of (apparently) Hylurgus or Dendroctonus. What species is it? We find about here a species of Dendroctonus, answering exactly to Dendroctonus piniperda. What species is it? We also find another species of the same genus (apparently), but with the elytra and part of the thorax ferruginous on the top, looking as if it had been rubbed. What species is it? The last two are common; of the first only one was found, and that by myself.—*John Grubb; Newtown School, Waterford, February* 24, 1874.

[The testaceous insect is probably an immature specimen of Hylurgus piniperda. I cannot venture to name the others. —*Edward Newman.*]

Eriogaster lanestris Five Winters in the Pupa State.—I bred out a pair of this insect on March 18th, 1874, the same having gone into pupa on July 8th, 1869, thus passing five winters in the pupa state. I have a few more pupæ, which still show no signs of coming out.—[*Rev.*] *A. C. Hervey; Pokesdown, Bournemouth.*

Ichneumonideous Parasite on a Boarmia Larva.—Will you kindly inform me what the enclosed is caused by? I find some of them every year on my Clematis. Last year I had a larva, which I supposed to be that of Rhomboidaria: it grew enormously for a time, but eventually died; and I found two of these combs protruding from the skin, as though caused by an Ichneumon.—[*Rev.*] *E. H. Eyles; Enfield.*

[The curious objects which accompanied this are the

elegant combs of a minute Ichneumon, Microgaster alvearius, the specific name being given in allusion to their wonderful resemblance to pieces of honeycomb: each cell contains a parasite, either in the state of larva, pupa, or imago.—*Edward Newman.*]

On Oak-leaf Insects.—The strength of the oak is proportioned to its trials or sufferings, and they are many and great, and the last, though not the least, of them in this country is the fly that deprives it of its offspring, and substitutes a changeling for a babe,—for acorns may be observed to be few or none where Devon-galls are many. One of the oak's little trials is the Phylloxera, of which at this season there are indications beneath one oak-leaf of the former presence of a thousand individuals, and a large Hemerobid larva, under the same leaf, accounted for their absence, and would have probably soon gleaned up the little remnant, about ten in number, that was left. In addition to the three species of insects before mentioned, a little Callimome at this season takes part in the economy of the spangle by committing to it an egg, and seems to be very rare as compared with the spangles; these are very variable as to their occurrence: some leaves are quite unspangled, others have only a few rosy spangles; other leaves are covered beneath with two hundred or three hundred beginning-spangles, not so large as the head of a very small pin. The full-grown spangles increase the beauty of the foliage at this time by adding to the diversity of its tints, sometimes by yellow marks; in other cases, when they are in excessive abundance, by causing the leaf to curl up and to display the under side, which is wholly rusty red by means of the spangles. The immense profusion of these is balanced by the fall of the leaf, which is previous to the swelling of the spangle and to the consequent growth of the enclosed grubs, and their increase is probably promoted by the destruction of birds and of other agents by which they are consumed. The little oak-button, formed by Neuroterus Numismatis, is sometimes thinly or thickly intermingled with the spangle, and sometimes has the whole of the under surface of the leaf to itself. The slug-like glutinous green grub of Blennocampa stramineipes is at this season stripping off by its jaws the covering of the oak-leaf with exceeding neatness, and leaving the skeleton quite transparent, with all the veins untouched.—*Francis Walker.*

Goureau's Observations on Parasitism.—A few more extracts from Goureau's observations on parasitism may be added as an indication of what is likely to be remarked in England with regard to the same insects. Platygaster scutellaris, *Nees* (male = muticus, *Nees* fem.), is parasitic on Cecidomyia Tritici; also a species of Coleocentrus lays its eggs outside those of the Cecidomyia, and its larva devours twenty larvæ of the latter. From the three Micro-Lepidoptera, Yponomeuta Padella, Y. Malinella, and Y. Evonymella, Goureau obtained Pimpla scanica, Ichneumon brunnicornis, Campoplex sordidus, Anomalon tenuicorne, Mesochorus splendidulus, Encyrtus fuscicollis (which comes by hundreds out of a single caterpillar or pupa), and Eurygaster (Erythræus) pomariorum; the grub of the latter lives in the nest, and devours successively larvæ and pupæ. He also mentions one specimen of Eulophus Cervus, which he does not describe.—*Francis Walker.*

Acanthocinus Ædilis.—Acanthocinus Ædilis is the name of the beetle sent by Mr. Sclater, of Castle Eden. I am obliged for it.—*Edward Newman.*

Aphilothrix Sieboldii in England.—I send for your acceptance a few galls, which I think you will find to be one of the species mentioned in the 'Entomologist' for March,—most likely A. Sieboldii. I also enclose the three imagos that I reared from them. Early in January, 1873, I found the above on the small twigs of an oak, which had been repeatedly cut down, and was growing in a hedge-bank. They were near the bank, covered with dead leaves, but not under the mould. The galls were quite new to me, and most of them were empty; but finding a few of them unbroken, I took them home, corked them up in a glass, and, I think, in May the three imagos emerged. The empty galls may have been old ones, but I at the time thought that most of the flies had escaped during the autumn of 1872. You will observe that the galls are very sparingly distributed over the branch, and not clustered. If they turn out to be one of the species of Aphilothrix, I will hunt them up, and perhaps I may find better specimens.—*Henry Moncreaff; High Street, Portsmouth, March* 2, 1874.

[There can be no doubt that these galls are those of Aphilothrix Sieboldii, and Mr. Moncreaff's communication is particularly interesting as showing, first, that the range of

this species extends to Britain, and, secondly, as positively connecting the gall with the gall-maker; probably, however, the name of A. Corticis, which has the claim of priority, will supersede that of A. Sieboldii. The species appear to be identical.—*Edward Newman.*]

Rose-galls.—I have by me an American rose-gall, of which the English rose-gall, about to be mentioned, is a little representative. The latter is inhabited by Rhodites Rosarum of Giraud, and, like the former, which nourishes Rhodites bicolor of Harris, is distinguished by its elegance, and it has generally the shape of a little spine-set ball, and its spines are red like the spines of the briar, and sometimes it has not a pea-shape, but is merely a swelling of the basal part of the spine. In this state it is with other spines, but in its round form it occurs on the surface or on the edge of a leaf, and is only indicative of the spines, which, like other spines and thorns, are said to be merely rolled-up leaves. With this gall there is another little one without spines; it is made by Rhodites Eglanteriæ of Hartig, and much resembles the Rosa spinosissima gall, in which Rhodites spinosissimæ of Giraud is reared; but more may be said on this matter in a future note on rose-galls.—*Francis Walker.*

Correction of an Error.—I am sorry I have to contradict my notice of the capture of Plusia Interrogationis (Entom. vii. 23). It proved to be P. Pulchrina, a species I had never seen. Mr. N. F. Dobrée, upon seeing it, instantly discovered my mistake; and I should not like knowingly to add one to the long lists of "rarities," whose history is, to say the least of it, doubtful.—*Geo. R. Dawson; Poundsworth, Driffield, March* 20, 1874.

Extracts from the Proceedings of the Entomological Society of London, January 5 *to February* 3, 1874.

Photographs of Insects taken with Camera Obscura.—Mr. Mendola exhibited some photographs of minute insects taken with the camera obscura and microscope.

A Bombyx with Aquatic Larva.—Mr. M'Lachlan called attention to a paper in the last part of the 'Annales de la Société Entomologique de France,' by M. Bar and Dr. Laboulbène, on a species of a Bombycidæ closely related to the tiger-moths described and figured by M. Bar as Palustra

Laboulbenei, and of very extraordinary habits, the larva being aquatic, living in the canals of the sugar plantations in Cayenne, and feeding upon an aquatic plant. The hairy larva had all the form usual for the group, and breathed by means of small spiracles,—a supply of air being apparently entangled in its hairs. The cocoons were joined together in little masses floating on the surface of the water.

Olivierian Collection.—Mr. M'Lachlan read a letter that he had received from M. Ernest Olivier, stating that the collection of insects formed by his grandfather had been purchased some years after his death by MM. Chevrolat and Jousselin. A great part of the collection had been suffered to fall into decay; but recently a portion, comprising the Curculionidæ, Heteromera, Lamellicornes, Sternoxi, Chrysomelidæ, Clavicornes and Hydrocantharidæ had come into his possession, and he would be happy to show them to any English entomologist who might desire to examine any of the numerous types. Unfortunately the Carabidæ and Longicornes were almost entirely lost.

Election of Officers.—The following gentlemen were elected Members of Council for 1874:—Sir Sidney Smith Saunders, Messrs. W. C. Boyd, Dunning, Grut, Meldola, Moore, M'Lachlan, F. Smith, Stainton, Stevens, Verrall, Jenner Weir, and Professor Westwood. The following officers were subsequently elected, *viz.*:—Sir Sidney Smith Saunders, President; Mr. M'Lachlan, Treasurer; Messrs. Grut and Verrall, Secretaries; and Mr. Janson, Librarian. The President then read an Address on the progress of Entomology during the past year.

Insects in Limestone Caves.—Mr. Müller exhibited the following specimens, which he had found on a recent visit to some limestone caves in the Jurassian Mountains. 1. A blind Myriapod, found on decayed trunks of trees carried into the cave by floods. 2. A minute Podura, which had, however, become quite shrivelled. 3. A species of Hæmalastor, *Koch* (a genus of Schusselzecken), mentioned by Kolenati in 'Die Parasiten d. Chiroptera' (Dresden, 1857). Mr. Müller did not observe any bats in the cave, but the insect was creeping on one of the stalactites, from which it dropped into his hand. He believed it was the first time that any blind specimens had been found in the caves of Switzerland.

Longicorn destructive to Coffee Plantations at Natal.—The Secretary read extracts from a letter from Mr. W. D.

Gooch, of Spring Vale, Natal, on the destruction of the coffee plantations there by a Longicorn beetle. He stated that they were splitting up the diseased stumps, and that only about two per cent were unaffected. The larvæ bored into the tree between the forks of the root, working into the heart and feeding on the wood, as high up as nine or twelve inches above ground. A specimen of the insect was exhibited, which proved to be Anthores leuconotus, *Pascoe*. In the bottle with the larvæ were also specimens of Ceroplesis caffra, but the former insect was stated to be the cause of the evil. They had split up some five thousand trees, which were diseased, and the only remedy which they had, as yet, tried, was to apply Stockholm tar to the roots: he would be glad to be advised as to the best mode of exterminating the insects. Mr. M'Lachlan remarked that it was very important to ascertain if the insect was really the original cause, or whether, as he believed, the trees were previously diseased. Mr. Müller was of opinion that the eggs were laid on sound trees, and he added that the maximum time for the appearance of the perfect insect was only about two weeks, and suggested hand-picking as they came out, a practice frequently adopted on the continent of Europe, with regard to Melolontha: it was also very desirable to avoid shooting the various species of insectivorous birds, which were frequently destroyed for the sake of their plumage.

[I entirely agree with Mr. Müller in supposing the eggs were laid on sound wood. During fifty years attention to this subject, I have never found the larvæ of Longicorn beetles in decayed wood, or those of Lamellicorn beetles in sound wood.—*Edward Newman.*]

The West London Entomological Society.—The first exhibition of the above Society took place December 2nd and 3rd, 1873. The principal rarities were a specimen of Bolitobia fuliginaria, taken in the Blackfriars Station of the London, Chatham and Dover Railway, exhibited by Mr. Dow; some varieties of Cidaria suffumata, by Mr. Seabrook; a series illustrating the life-history of Orgyia gonostigma, and a hermaphrodite specimen of Anthocharis Cardamines, by Mr. Wyatt; specimens of Cerura bicuspis and Notodonta Carmelita, from Tilgate Forest, by Mr. Cooke.—*E. W. Timmins.*

THE ENTOMOLOGIST.

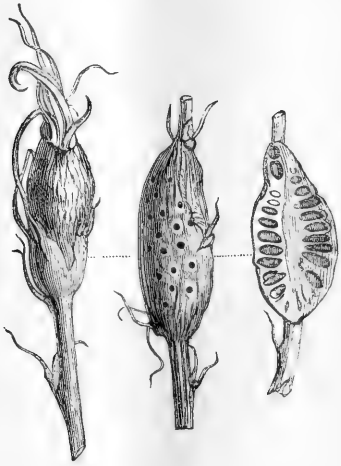
No. 129.] MAY, MDCCCLXXIV. [Price 6d.

Melitæa Selene ? variety.

Melitæa Selene ? variety.—This singular specimen, which is in the rich collection of Mr. Stevens, almost defies every attempt to fix its specific name. The colour on the upper side is fulvous, or raw-sienna brown marked with black, in the manner which the clever drawing by Mr. Willis so well indicates: the fore wings have three amorphous blotches in a longitudinal series beneath the costa and above the middle of the wing; the wing-rays are incrassated by black margins, and each intervening area is divided by a short transverse bar; on the left-hand wing four of these areas have each an oblong narrow spot near the middle; the hind wings are dark, almost black, but not without paler spaces and reflections in the basal portion; each has also a submarginal series of six oblong fulvous spots. The under side can scarcely be described, the black, brown, fulvous, and silver, are so mixed up, and so entirely without distinguishing specific characters. *-Edward Newman.*

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

Fig. 8.



a. *b.* *c.*

DRYOPHANTA MACROPTERA.

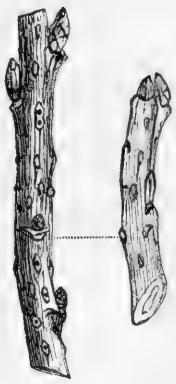
a. WITH THE GALL-MAKER STILL PRESENT. *b.* THE GALL AFTER THE ESCAPE OF THE GALL-MAKER. *c.* A SECTION.

Dryophanta macroptera.—On the young twigs of the Turkish oak, Quercus Cerris, this species produces swellings, which vary considerably in size and form; sometimes they are small and of an elongate-oval form, and, like cocoons, contain a larva, and in this case they produce merely a slight incrassation of the twig. Sometimes the cells are densely crowded, and arranged in a radiating fashion under the rind, causing a manifest thickening of the twig. The perfect insect emerges in October of the same year.—*G. L. Mayr.*

Dryophanta macroptera has four inquilines; one of them occurs also in the two preceding galls. (1) Synergus flavipes, *Hart.:* June; second year. (2) S. variabilis, *Mayr:* May to July; second year. (3) S. rotundiventris, *Mayr:* May; second year. (4) Ceroptres Cerri, *Mayr:* May; second year.—*F. Walker.*

Andricus noduli.—This little gall, like the preceding, is invisible from the exterior, being embedded in the bark of Quercus pedunculata and Q. pubescens. A small spherical or oval swelling is observable on the young shoots of the Quercus pedunculata, raising the bark or rind from 1·5 millemetres to 2 millemetres in diameter, and beneath this swelling is situated the gall. On Quercus pubescens the swelling occasioned by this gall is still less perceptible, on account of the tomentum on the surface, and sometimes it is entirely absent. It is best to look for these galls at the end of September, when the perfect insect emerges: after some have escaped, and have left little circular holes in the rind, it is easier to watch the remainder, as they usually follow in the course of a few days. The circular aperture, made by the perfect insect on its escape, is scarcely half a millemetre in diameter. The oval gall, only 1·3 millemetre in length, is situated either between the bark and the wood, or in the wood itself, and is placed longitudinally with the twig: it is white, and closely surrounded by wood and bark; it has a thin covering, and contains one larva cell. On the twigs of Quercus pedunculata the externally-visible swelling subsides after the escape of the perfect insect, and becomes a blackish coloured speck, with a circular aperture in its middle. In Quercus pubescens you are frequently unable to detect the swelling at all, and if any unevenness has existed it remains after the perfect insect has made its escape, and the surface of the bark does not change colour. This gall is occasionally on leaf-pods and on petioles. It is probable that the gall named C. Turionum, with which I am unacquainted, belongs to this species.—*G. L. Mayr.*

Fig. 9.



a. *b.*

a. Andricus noduli.
b. A section.

Mayr mentions three inquilines inhabiting the galls of Andricus noduli: Ceroptres arator, *Hart.*, Sapholytus connatus, *Hart.*, and Synergus apicalis, *Hart.* The first appears in May and June of the second year; the third in May of the second year.—*Francis Walker.*

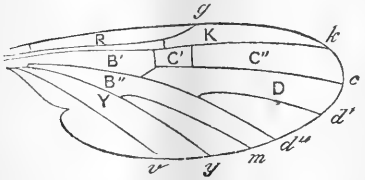
Notes on the Wing-bones of the Two-winged Flies.

By Francis Walker, Esq.

(Continued from p. 42.)

Bones.	Areolets.
g Subcostal.	R Subcostal.
k Radial.	K Radial.
c Cubital.	C′ Cubital, 1st.
c′ Cubital, 1st branch.	C″ Cubital, 2nd.
c″ Cubital, 2nd branch.	B′ Præbrachial.
d′ Præbrachial, 1st branch.	B″ Pobrachial.
d″ Præbrachial, 2nd branch.	D Subapical.
m Pobrachial, 1st branch.	Y Anal.
y Pobrachial, 2nd branch.	
v Anal.	

Fig. 7.—Sciophila.



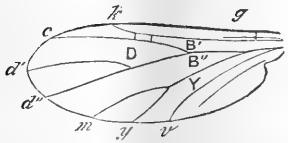
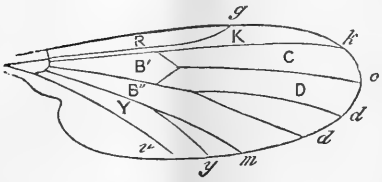


Fig. 8. –Tetragoneura sylvatica.

Fig. 9.—Gnoriste.



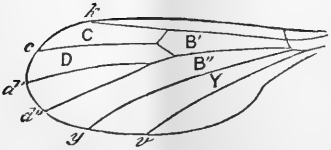
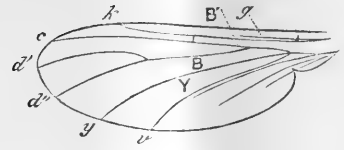


Fig. 10.—Mycetophila, sp.

Fig. 11.—Sciara.



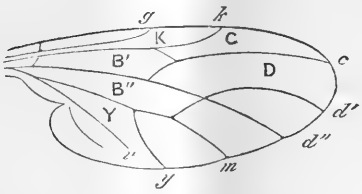


Fig. 12.—Bibio.

THE inspection of the wing of a fly is generally sufficient to ascertain the genus of the individual to which it was attached, and there is much interest in tracing the great variation of the wing-bones of Diptera, and in observing how many changes are effected by the modifications of a few parts of the structure. Strength and swiftness of flight is generally accompanied by many wing-bones, but in numerous cases the bones are many, and the flight is very feeble. In a few groups some of the bones are very slender, so as to be termed secondary. This is more conspicuous in some Hymenoptera, such as Chalcidiæ, when the fore wing has generally only one bone near the costa, but in the largest species one or two diffuse veins or incipient bones in the disk may be indistinctly traced. The return of mild or warm weather and the morning sun impart much vivacity to the wings by means of electric currents through the bones, and recal the Diptera from a torpid state, like as comets become developed and move more rapidly when they approach the sun.

Five of these six figures, and the preceding six in the 'Entomologist,' pp. 36, 37, represent the wing-bones of Mycetophilidæ: this family forms two divisions, Mycetophilini and Sciarini, of which the first includes seven sub-families,—Diadocidinæ, Mycetobinæ, Boletophilinæ,

Macrocerinæ, Ceratoplatinæ, Sciophilinæ, and Mycetophilinæ. Mycetobia (sub-fam. 2) differs especially from Diadocidia (sub-fam. 1) in the much greater length of the subcostal, and in the nearer approach of the radial to the tip of the wing. Ditomyia (sub-fam. 2) differs from Mycetobia in the incomplete and very short subcostal, in the forked cubital, and in the much longer fork of the præbrachial. In Platyura (sub-fam. 5) the subcostal is complete but short, the radial is much shorter than that of the Ditomyia, and the fore fork of the cubital is very short. In Bolitophila (sub-fam. 3) the subcostal is elongated, the fore fork of the cubital is as short as that of Platyura, but joins the radial near the tip of the latter; the first pobrachial is much longer than in any of the preceding genera. In Macrocera (sub-fam. 4) the subcostal and the radial are shorter, and the very short fore fork of the cubital is beyond the tip of the radial; the curve of the cubital also distinguishes this from all the preceding genera. In Sciophila (sub-fam. 6) a greater change occurs in the structure of the bones; the cubital has two short approximate directly transverse forks, which join the radial. In Tetragoneura, belonging to the same sub-family, the structure is still more altered; the subcostal is incomplete, and very short; the radial and the cubital are gathered closer to the costa, and the two forks of the radial are shorter and more approximate than in Sciophila, and the two branches of the pobrachial are much nearer to the tip of the wing. In Gnorista and in Mycetophila (sub-fam. 7) the cubital is simple, and the arrangement is much like that of Diadocidia and of Mycetobia, excepting the peculiar curved radial of the latter. In the Mycetophila, here figured, there is no subcostal, and the præbrachial does not form two branches. In Sciara (div. Sciarini) the resemblance to Tetragoneura is apparent; the radial and the cubital are curved near the costa; the other veins are slight or secondary, and the præbrachial does not form two branches. There is a transition from Sciara to Cecidomyia when the veins are very few; but these notes are limited to the figures which they accompany. The flight of all the preceding genera is feeble, short, and flitting; that of Bibio (fam. Bibionidæ) is hovering, and of long continuance, and there is another plan in the construction of the wing-bones.

Francis Walker.

Notes on some Amurland European Diptera.

By Francis Walker, Esq.

Mycetophilidæ.

There are probably many undescribed European species of this family, notwithstanding the extent of Winnertz's monograph: very few have been recorded from South Europe.

Div. 1. *Micetophilini.* Subfam. *Macrocerinæ.*

Genus *Macrocera.*—M. vittata occurs near Rome.

Subfam. *Ceratoplinæ.*

Genus *Platyura.*—P. nemoralis and P. discoloria were observed near Rome, P. basalis at Florence, and there appear to be two undescribed British species, one found in North Wales, the other in the Isle of Man. The large British species, P. vitripennis, is not recorded by Winnertz; it mimics P. atrata, which belongs to another division of the genus.

Subfam. *Sciophilinæ.*

Genus *Sciophila.*—Two species not recorded by Winnertz: one found in the Isle of man, the other at Florence.

Genus *Polylepta.*—One undescribed species found in North Wales.

Subfam. *Mycetophilinæ.*

Genus *Syntemma.*—One new species found in North Wales.

Genus *Trichonia.*—One new species in the Scilly Isles.

Genus *Allodia.*—One new species in North Wales.

Genus *Phronia.*—One new British species, and one found in Switzerland. S. nitidiventris occurs in the Scilly Isles.

Genus *Exechia.*—One new species in North Wales, another found near Pisa.

Genus *Sceptonia.*—S. nigra inhabits Amurland.

Genus *Mycetophila.*—M. punctata and M. gibba in Amurland.

Div. 2. *Sciarinæ.*

Genus *Sciara.*—S. Thomæ occurs near Rome and in Amurland, where there are some other species which are not sufficiently well preserved to be recorded. Two apparently

undescribed species occur in Italy; one in Switzerland; and I have found S. alpicola on the Col de Voga, near Chamouni.

BLEPHARICIDÆ.

I have found species of this family near Martigny, in Switzerland, and near Florence, in Italy, and remarked its peculiar characters and manner of flight, and have placed it between the Cecidomyidæ and the Bibionidæ. A. H. Haliday wrote to me about the localities in which he saw them, and about the genera and species of the family, and remarked that "the analogy in the development of the eyes (male) to a Baetis is very striking, and the secondary net-work of delicate veins of the wings is also remarkable. I have been able to observe its carriage when alive, and find little to justify the comparison with Chironomus that has been made. It seems always to alight on the under surfaces, so hanging back downwards, the wings divaricated and a little deflected from the horizontal plane, the abdomen above their level, while the head is stooped."

FRANCIS WALKER.

Entomological Notes, Captures, &c.

Cnethocampa pityocampa and another, as observed at Nice.—With reference to the captures of larvæ of C. Pityocampa, recorded in the 'Entomologist' for April (Entom. vii. p. 81), it may interest you to know that I made a little acquaintance with them during my stay at Nice this winter. I first observed their nests on the fir trees, about a fortnight before Christmas, 1873, and upon examining one of these webs I found some hundred or hundred and twenty larvæ, about half an inch long, very closely packed,—I suppose for warmth: when I handled them I did not feel any effects from their urticating quality, which perhaps they did not then possess; and to save myself the trouble of feeding them up, and besides having no convenience at hand for doing so, I left them on the tree where I found them, and did not again look at them until the middle of March, 1874, when I observed that they began to descend the tree by ones and twos, and toward the end of the month they commenced forming their

processions across the garden-path: unfortunately, I never counted how many there were in these processions, but I think I shall be within the mark when I say that they ranged from twenty to one hundred, all marching in admirable order. I have also seen them walking three and four abreast, but not often. I then discovered that their small hairs came off when they were handled, and occasioned me severe irritation, which in the course of a few hours became very painful, producing something like the effects of a stinging-nettle, namely, small white spots on the skin, which continued for about forty-eight hours afterwards. In addition to C. pityocampa I found one specimen of another larva, which also possessed this irritating power: it is about two and a half inches long, of a mahogany colour, sprinkled rather sparingly with grayish blue fine hairs all along the back; on the 3rd and 4th segments it has crests of deep blue hairs, longer than the others, extending on either side almost to the spiracles; partly on the 8th and partly on the 9th segments it has the figure of a minute butterfly of the swallow-tail type, also of grayish blue, and measuring a quarter of an inch across; it has legs on the 2nd, 3rd and 4th segments, and claspers on the 7th, 8th, 9th, 10th and last segments. After preserving this larva my wrists and round the lower part of my eyes were covered with minute blisters, which caused me great irritation; I took the precaution to wear gloves, so that my hands did not suffer.—*H. Wittich;* 6, *Lansdown Cottages, Dalston, April* 20, 1874.

The Colorado Potato Bug.—Panic is a cherished "Institution" among us dauntless Britons,—"Hearts of Oak," as we call ourselves. This bugbear takes a variety of forms: sometimes it is a Napoleon, then a ghost, then, *presto!* it is a comet, anon an invisible fungus, Peronospora infestans; then a second Napoleon, then a bottle-nosed whale, then a coal famine, and now a potato bug. A few, a very few, incline to investigate: they exclaim, "We must look into this matter;" but their "lookings into" are confined to the penny-a-lining columns of the 'Telegraph' and 'Times,' and the penny-a-liners adopt a florid and fluent, but vague, style, in order to extend the panic: if they succeed in getting up a deputation to a President of the Board of Trade, or to a Chancellor of the Exchequer, so much the better; it hurts no one, and brings grist to their mill. Under great pressure,

and throughout all the correspondence about the potato bug, I have been silent; I have not cried "Wolf," simply because I do not believe the wolf is coming. The editor of the 'American Entomologist' informs us that there are "at least a dozen different species of potato bug:" these are principally of the genera Lytta and Epicauta, beetles very nearly related to the familiar blister-beetle, Lytta vesicatoria. The more destructive, or more noticed, are Epicauta marginata, E. lineata, E. strigosa, E. murina, and especially, E. atrata. The Count Dejean, with his usual fertility of name-giving, has multiplied these names, but whether he has discovered new species I will not venture to say. All these beetles, when in the perfect state, devour the potato-haulm with a rapidity and voracity that appears almost incredible, leaving the bare stalks standing up like stag's-horns. Next in importance are the various species of Chrysomela, or bloody-nosed beetle, and entomologists incline to place the Chrysomela decemlineata of Thomas Say at the head of them for mischief; the larva is even more voracious than the perfect insect: both devour the haulm, and the haulm only. The third family of potato-beetle comprises the genera Cassida, Cryptocycla, and Chelomorpha (tortoise beetles), the larvæ of which are beset with prickles in a very curious fashion: all these beetles are leaf-eaters, and if I may take the statement of our friends in America they are *potato*-leaf eaters. It will be hardly necessary to state that I have no practical acquaintance with any of these beetles, except as preserved in cabinets, or that I see small prospect of their crossing the Atlantic; but still when I recollect that Pieris Rapæ has already crossed in a contrary direction, I can by no means deny the possibility of such an event; and, therefore, I will give my English readers an opportunity of studying the remedies which our transatlantic friends think they have found most efficacious.—*Edward Newman.*

"*Artificial Remedies: Paris-green.*—The many entomologists and agriculturists who have experimented on this insect—with various poisons and other substances, in those portions of the United States where it has been so destructive for some years past—concur in recommending the use of Paris-green diluted with flour, ashes, or air-slacked lime, as the best remedy known for destroying the insect both in its

larva and beetle state, without injuring the plant. The results of our experiments and investigations confirm this opinion, and this remedy is, no doubt, a reliable one, provided the Paris-green be of good quality. Our experience has also satisfied us that flour is a much better substance to mix the green with than either ashes or lime, as the insects eat it more readily, and, at the same time, it adheres more tenaciously to the surface of the plant, and hence is not so easily washed off by rain. We found good effects from a mixture of one part by weight of Paris-green, with ten or twelve parts of flour, dusted lightly on the vines early in the morning, when the dew is on the foliage.

"*Quantities Required, and Probable Cost per Acre.*—After a careful estimate, we consider that three pounds of the Paris-green, economically used, will be found sufficient for one acre of potatoes. Assuming fifty cents to be the ordinary retail price per pound of Paris-green, every application of the mixture would cost from two to three dollars per acre, exclusive of the labour. If the insect is very abundant, two or more applications may be required, as exposure to wind and rain will eventually remove the powder entirely from the leaves, rendering them liable to further attacks. Some discretion should be exercised in selecting a suitable time for using the mixture, which should not be applied during high winds, or immediately before a rain storm.

"*Other Remedies Tried.*—We did not content ourselves with the use of Paris-green only, but experimented with as many other substances as the limited time at our disposal would admit of; and, although we would not have the results here given to be considered as final in reference to the materials used, we trust they will be of value as indicating the most promising remedies for further trial.

"*Arsenious Acid* (*Arsenic*).—This chemical being much cheaper than Paris-green, and more uniform in its composition, we hoped it would have proved a practical and sound remedy. We tried it in the proportions of half-ounce, one ounce, and two ounces, to a pound of flour; and while we are not prepared, from the few trials we have made, to entirely disapprove of its use, the results we have obtained point to the conclusion that where it has been used in sufficiently large proportions to destroy the insect, it has caused

more or less injury to the leaves. In cases where Paris-green is not obtainable this might be used as a substitute, in the proportion of one ounce to a pound of a flour, which should always be coloured with some black powder, such as charcoal or black antimony, so as to lessen the risk of accident from its use.

"*Powdered Cobalt or Fly-poison.*—Another arsenical compound was also tested, known in commerce as powdered cobalt, or fly-poison. This was used in the same proportions as the last mentioned, and with similar results, but, owing to its higher price, we do not recommend it for general use.

"*Sulphate of Copper* (*Blue-stone*).—A strong solution of this salt was tried in the proportion of two ounces to one gallon of water, and showered on the vines with a watering-pot, without damage to either the insect or the plant.

"*Bichromate of Potash.*—This is a poisonous substance largely used in dyeing, and one which has attracted some attention in France of late, as a remedy for insects. We used it dissolved in water, in the proportion of two ounces to three gallons of water. This killed the insects effectually, but, at the same time, destroyed the plants. Whether, in a more diluted form, this remedy could be effectively used without injury to the foliage, we are unable at present to say, but shall experiment further with it.

"*Powdered Hellebore.*—This powerful irritant, which is so effectual as a remedy for the currant-worm, we tried without perceptible effect, both in powder and also mixed with water. Several other poisonous substances were also used with like results.

"*Carbonate of Lime.*—There are several preparations sold under this name, which we found to vary much in composition and character, and equally so in effect. We tried an article known as Dougall's, without any good result, but succeeded better with one prepared by Lynam Brothers, of Toronto,—a black powder, manufactured, we understand, from coal-tar. This destroyed a large proportion of the larvæ, but we doubt whether it would kill the perfect insect; it is, moreover, used in an undiluted form, which would render its cost greater than that of the Paris-green mixture. Some see no advantage in using it, although the fact of its being less poisonous may induce some to try it who are prejudiced against Paris-green.

"*Ashes and Air-slacked Lime.*—This, we found, had been extensively used by many of the farmers on the frontier districts, but, as far as we could see or learn, without any perceptible results.

"*Suggestions.*—Paris-green, which we regard as the most practical and efficient remedy for this insect-pest is, unfortunately, as found in commerce, a substance most variable in its composition. It is an arsenite of copper, and the best qualities contain about sixty per cent. of arsenic, on which its activity depends, but the inferior grades contain a much smaller percentage, and are proportionately less effective, and sometimes almost worthless for this purpose. It is highly important that the public be supplied with a good quality of this useful material, and at as low a price as possible, as an encouragement to its use; and we would strongly urge on the Department the expediency of making such arrangements with the wholesale dealers in Toronto as will enable farmers and others to obtain a reliable preparation at a stated uniform price. We would further suggest that, for convenience sake, the Paris-green be made up in packages containing one pound each, with printed directions for its use, and cautions regarding its poisonous qualities. We would also recommend the Department to strongly urge upon farmers to plant in future only such quantities of potatoes as they can well look after: one acre, carefully cultivated and watched over, will probably yield more gross results than four or five acres if neglected; indeed, wherever the beetle is numerous, negligence is sure to be repaid by the utter destruction of the crop."

Breeding Zygæna Loniceræ.—In reply to the editor's note to my paper on the larva of Zygæna Trifolii, in the April number of the 'Entomologist' (Entom. vii. p. 90), I have on only two occasions attempted to rear the larva of a Zygæna through the winter, and on both occasions the species was Loniceræ. No difficulty was experienced in keeping them alive. In the first brood I kept, some years ago, the larvæ were confined in an ordinary breeding-cage, and, as Mr. Newman says, ceased feeding in the autumn very early, and when very small, and attached themselves to the sides and roof of the cage, though some of them occasionally wandered about a little throughout the winter. A great difficulty

presented itself in the spring, however: though apparently quite healthy, they absolutely refused to *grow*, and this sort of thing continued until the end of the summer, and long after the imagos should have been out, the larvæ being even then little more than a quarter of an inch in length. Indeed, as it appeared evident they would hybernate a second time, I got thoroughly tired of them, and either turned them out or gave them away, I do not remember which. The other brood is from a few eggs I obtained last summer, and the larvæ thus far have acted in precisely the same manner as did the former ones: when examined yesterday many of them seemed quite healthy, but show no disposition to feed, though there has been food growing in the cage throughout the winter, and now looks beautifully fresh. The cage has been kept during the winter in a greenhouse (no artificial heat) in the garden. Larvæ of various Acidalia and other species, kept under precisely the same conditions, have been feeding several weeks.—*Geo. T. Porritt; Huddersfield, April* 2, 1874.

Breeding Tæniocampa opima.—I have read your correspondent Mr. W. H. Tugwell's account of the way in which he successfully reared the larvæ of Tæniocampa opima last year (Entom. vii. p. 86). I was equally successful with my brood of that species, though with a totally different kind of treatment. The previous year I had lost every caterpillar, I supposed through having kept them rather closely confined (the plan which has succeeded in Mr. Tugwell's case), so last year I kept them in a roomy cage, which was placed close to a small, constantly-open window; this kept the larvæ nearly always in a *draught*, sometimes a strong one. The brood was a large one, and fed up fast on willow, and a healthier or finer lot I think I never saw; scarcely one seemed to be lost. Has not the season something to do with it? Opima seems to have been much easier to rear last year than it was the previous one. Willow, too, seems decidedly the most satisfactory food.—*Id.*

Migration of Butterflies.—Mr. Belt, in his interesting work, 'The Naturalist in Nicaragua,' pp. 152—154, speaking of this curious fact, says that the butterflies (Timetes Chiron) were all flying in a south-easterly direction, and that the beautiful day-flying moth (Urania Leilus) also joins in this annual movement. Many other travellers have observed

similar migrations in South America, Ceylon, &c., but none seem to give any satisfactory explanation of why these migrations should annually take place. Mr. Belt, I think, nearly hits on the probable solution when he says: "I thought that some of the earlier flights in April might be caused by the vegetation of the Pacific side of the Continent being still parched up, whilst on the Atlantic slope the forests were green and moist; but in June* there had been abundant rains on the Pacific side, and vegetation was everywhere growing luxuriantly; neither would their direction from the north-west bring them from the Pacific, but from the interior of Honduras and Guatemala: the difficulty is that there are no return swarms." If this be correct—and I believe Mr. Darwin, Mr. Bates, Mr. Holdsworth, and a host of other eminent authorities, incline to this view—we can advance so far on the stage of enquiry as to set down for certain that the migration takes place *after* the eggs have been deposited on, or near, the food-plant, otherwise the species would become extinct in the north-west quarter, from which it started in two or three years at the most. Is anything known of the food-plant of either of the migratory species of butterflies? If so, does it occur in patches widely separated, or is it generally distributed along the whole route of migration? Cannot Mr. Bates or Mr. Holdsworth give us some information on this point? I fancy, although not observed by Mr. Belt, that there must be an autumn, as well as a spring, migration, otherwise how are the insects provided for the next spring flight, except the eggs be deposited before the insects leave the immediate neighbourhood where they were hatched? I take it, that if there is no hybernation of insects in tropical countries, there can be little necessity for this provision of Nature during an almost perpetual summer. It would certainly be helping us in the enquiry if we knew (1) whether the migratory flights consist of both sexes, and (2) whether the larvæ are found feeding in the districts vacated by the imagos? This would probably give a clew to the cause of migration: it would tend to show whether sportive or of necessity. I am no believer at present in the sportive theory;

*I am unable to see how rain in June would influence the growth of vegetation in April, especially where so much rain falls annually as in Nicaragua.—*H. R.*

there must I fancy be a necessity—a movement, in fact—in search of a locality where the food-plant in spring is earlier, as suggested by Mr. Belt. At any rate, with entomologists living on the spot, especially in Ceylon, we ought soon to have more reliable data on the economy of migratory butterflies.—*Henry Reeks; Manor House, Thruxton, April* 9, 1874.

Tortrix ribeana and T. cerasana.—"Mr. Barrett asked me whether I thought Tortrix ribeana and T. cerasana were species, or only varieties. Dr. Knaggs quotes a portion of my reply, and appears to infer that I had only once seen the two forms in copulation. I have seen them so repeatedly, and, as the larvæ are similar, I have no doubt of their being varieties of one species.—*Henry Doubleday; Epping, March* 14, 1874." ('*Entomologist's Monthly Magazine*' *for April*, p. 253.)

[When, as in this instance, two shades of colour in imago are produced from similar larvæ, and the two shades habitually intercopulate, we must not suppose them species, otherwise the species of some Tortricidæ would be endless. —*Edward Newman.*]

Phycis Davisellus, Newman.—I sent a pair of this species to my kind friend Professor Zeller, who informs me that it is new to him, and he believes it is unknown on the Continent. It bears no resemblance whatever to Albariella, and does not belong to the same genus.—*Henry Doubleday; Epping.*

Polydrusus sericeus.—In May of last year (1873) I had the good fortune to secure, near Crabbe Wood, Winchester, a single example of the beautiful green weevil, Polydrusus sericeus, *Schonherr*, a species which, as I am informed by Mr. Janson, "though taken in some numbers many years ago by the late Rev. G. T. Rudd, in a wood at Kimpton, near Ringwood, Hants, has not, to my knowledge, occurred since." —*W. A. Forbes.*

Cryptocephalus bipustulatus.—With regard to Cryptocephalus bipustulatus, which I have noticed in the January number of the 'Entomologist' (Entom. vii. p. 23) as occurring on St. Catherine's Hill, Winchester, it may be of interest to know that C. lineola, of which C. bipustulatus is regarded by some as a variety, has also occurred during the past summer in exactly the same locality, so that this, as far as it goes, seems to show that the above view is the correct one. I may

add that no heather, on which C. bipustulatus is taken, grows nearer than about half a mile off, and there only in a small patch on the top of another hill.—*W. A. Forbes.*

Dasypolia Templi.—I am advised to keep Templi larvæ out of doors in an open box planted with Heracleum sphondylium. Is this wise, when they are so likely to be attacked with ichneumons? Would it not be better to cover the box with tarlatan?—*Owen Wilson; Cwmffrwd, Carmarthen, April* 13, 1874.

[I would, nevertheless, recommend the larvæ being kept in the open air; the chance of the ichneumon of Dasypolia Templi finding the larva of that insect in a state of captivity, as it may be called, is very small.—*Edward Newman.*]

Rose-galls.—In the beginning of April the gall, mentioned in the 'Entomologist' (Entom. vii. p. 94), produced one female specimen of Rhodites Rosarum and two males of a Callimome.—*Francis Walker.*

Humble Bees Fertilizing Gentians.—The closed gentian (Gentiana Andrewsii) has flowers an inch and a quarter or more in length. These inflated, bright blue flowers of late autumn appear to be always in the bud, as they never open. The corolla is twisted up, so as to leave no opening at the top. The flowers are all nearly erect, with two stigmas considerably above the five anthers. I see but one way in which it can be fertilized, that is by insects. Several of my students, as well as myself more than two years ago, have often seen humble-bees entering these flowers. They pry into or untwist the opening with their mouth-organs and legs, and then pop into the barrel-shaped cavity, which they just fill.—'*American Naturalist*,' vol. viii. p. 180.

Organs of Hearing in Insects.—At the last meeting of the National Academy of Sciences, Professor A. M. Mayer exhibited experimental confirmation of the theorem of Fourier, as applied by him in his propositions relating to the nature of a simple sound, and to the analysis by the ear of a composite sound into its elementary pendulum-vibrations; and to show experiments elucidating the hypothesis of audition of Helmholtz. Placing a male mosquito under the microscope, and sounding various notes of tuning-forks in the range of a sound given by the female mosquito, the various fibres of the antennæ of the male mosquito vibrated sympathetically to

these sounds. The longest fibres vibrated sympathetically to the grave notes, and the short fibres vibrated sympathetically to the higher notes. The fact that the nocturnal insects have highly organized antennæ, while the diurnal ones have not, and also the fact that the anatomy of these parts of insects shows a highly developed nervous organization, lead to the highly probable inference that Prof. Mayer has here given facts which form the first sure basis of reasoning in reference to the nature of the auditory apparatus of insects. These experiments were also extended in a direction which added new facts to the physiology of the senses. If a sonorous impulse strike a fibre so that the direction of the impulse is in the direction of the fibre, then the fibre remains stationary. But if the direction of the sound is at right angles to the fibre, the fibre vibrates with its maximum intensity. Thus, when a sound strikes the fibrils of an insect, those on one antenna are vibrated more powerfully than the fibrils on the other, and the insect naturally turns in the direction of that antenna which is most strongly shaken. The fibrils on the other antenna are now shaken with more and more intensity, until, having turned his body so that both antennæ vibrate with equal intensity, he has placed the axis of his body in the direction of the sound. Experiments under the microscope show that the mosquito can thus detect to within five degrees the position of the sonorous centre. To render assurance doubly sure, Prof. Mayer, having found two fibrils of the antennæ of a mosquito which vibrated powerfully to two different notes, measured these fibrils very accurately under the microscope. He then constructed some fibrils out of pine wood, which, though two or three feet long and of the thickness of small picture-cord, had exactly the same proportion of length to thickness as the fibrils of the antennæ of the mosquito. He found that these slender pine rods or fibrils had to each other the same ratio of vibration as the fibrils of the mosquito.—'*American Naturalist*,' vol. viii. p. 236.

British Aphides requested.—For the last two years I have been engaged in describing and drawing from life all the British Aphides that have come under my notice. May I ask, through your pages, such co-operation from our entomologists as they may have it in their power to give? I shall

much appreciate help in obtaining the following Aphides; their food-plants are fairly indicated by the specific names of the insects. Winged and wingless forms can be safely transmitted by post in quills, the ends of which are simply plugged with cotton. If the quills are rolled in a green ivy or cabbage leaf the Aphides will live three or more days. Autumn specimens are particularly valuable, since at that season the males and the oviparous females often occur. *Desiderata.*—Siphonophora Artemisiæ, S. Absinthii, S. Tussilaginis (female), S. Tanaceticola, Phorodon Inulæ, Rhopalosiphum Berberidis (female), Myzus Lythri, M. Asclepiadis, M. tetrarhoda, Aphis Nasturtii, A. Ballotæ, A. subterranea (female), A. Symphiti, A. Plantaginis, A. Capsellæ, A. Euonymi, A. Viburni, A. Craccæ, A. Serpylli, A. Euphorbiæ, A. Origani, A. Beccabungæ, A. terricola (parsnep roots), Cladobium populeus, Atheroides Serratulæ, A. Glyceriæ, Lachnus pinicola (female), L. agilis (female), L. Juniperi, L. Quercus, L. longirostris, Schizoneura lanigera (female), S. vagans (female), Pemphigus (not Bursarius), Vacuna Alni, *Passerini*, Phylloxera Quercus, Dryobius Roboris, *Koch*, Monaphis antennata, *Kalt.*—*G. B. Buckton; Weycombe, Haslemere, Surrey.*

Correction of an Error.—In my reply to Mr. Gregson's note upon Eupithecia innotata and E. egenaria, I inadvertently wrote "Norfolk" instead of Cheshire.—*Henry Doubleday; Epping, April* 16, 1874.

Extracts from the Proceedings of the Entomological Society of London, February 16 *to March* 16, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Insects Injurious to Wheat.—Mr. Weir exhibited a sample of wheat from Australia which was infested with the weevil, Sitophilus Oryzæ, the cargo being so much damaged that about two tons were utterly useless. The weevil was accompanied by Læmophlœus ferrugineus. He also showed specimens of Sitophilus granarius and Rhizopertha pusilla infesting wheat from Japan.

Hermaphrodite Ant and Coluocera Attæ.—Mr. F. Smith

exhibited (1) a hermaphrodite ant, Myrmica lævinodis, captured by Mr. J. Chappel, at Dunham Park, Cheshire: this insect combines characters of male, female, and worker. (2) Specimens of Coluocera Attæ, *Kraatz*, described in 'Berliner Entomologische Zeitschrift, 1858,' found by Mr. J. Traherne Moggridge, at Mentone, in the seed-magazines of Aphænogaster (Atta) Structor. With reference to the latter Mr. Moggridge writes as follows:—"I have lately been exploring a very large and far-spreading nest of Atta Structor, and I find in the abundantly-filled granaries great numbers of the small beetle which I enclose. Platyarthrus is also very common in the nests. I have never observed this beetle elsewhere, and I do not think it would have escaped me if it had been at all abundant in the nests of Atta barbara. I have opened but few nests of A. Structor, owing to their being usually placed either in terrace-walls or in garden-ground. I spend a great deal of my time now in digging for seeds in ants'-nests, as I want these seeds for the experiments I am making, in the hope of learning the secret method by which the ants can at will render their seeds dormant in damp soil. I am much struck by the frequent occurrence of the nests of trap-door spiders in the very soil of the ants'-nests, the spider's tubes often running quite close to, and in the midst of, the galleries of the ants. Ants certainly form a large part of the food of trap-door spiders, and this helps me to understand how it comes that the spiders can get a living without leaving their nests. The spider sits watching at the mouth of her tube, with the door raised very slightly, and then snatches in any insect that may chance to pass within reach."

Colorado Potato-Beetle.—The Secretary read some remarks taken from the 'Times' and 'Gardener's Magazine' on the rapid progress of the Colorado potato-beetle (Doryphora decemlineata) through the United States and Canada, and the remedy of Paris green, which was stated to have been used with success by the farmers in Canada. The fifteen-spotted ladybird was mentioned as a powerful enemy to the potato-beetle, devouring it in the larva-state. The writer in the 'Times' suggested the encouragement of small birds as the best security against the pest; but, as it had been stated that the insects when crushed produced blisters on the skin,

whenever they came in contact, and if they touched a wound caused severe inflammation and painful ulcers, Mr. Bates expressed a doubt as to whether the small birds would care to meddle with them.

[The beetles here spoken of as producing inflammation and ulcers are in all probability species of Lytta and Epicauta, and not members of the family Chrysomelidæ, to which Doryphora 10-lineata belongs.—*Edward Newman.*]

Musical Orthoptera.—Mr. M'Lachlan exhibited two male examples of an Orthopterous insect, belonging to the family Locustidæ, which had been placed in his hands by Mr. Daniel Hanbury, who received them some years since from his brother at Shanghai. It appeared from Mr. Hanbury's statements that these insects were sold in the streets of Shanghai, confined in little ornamental wicker-cages, and bought for the sound they produced. The species appeared to be undescribed, and to pertain to a new genus, somewhat allied to Xiphidium. The President remarked that in Turkey a kind of cricket was kept in a similar manner in paper cages, and fed upon lettuce-leaves.

Oniscigaster Wakefieldi.—Mr. M'Lachlan also exhibited a series of examples illustrating the natural history of Oniscigaster Wakefieldi from New Zealand. He had recently received from Mr. Wakefield a second series of specimens, including the male imago, female sub-imago, adult nymph, and larva. The lateral wing-like horny expansions of the terminal segments of the abdomen in the imago and sub-imago are continued in the aquatic conditions on each segment of the abdomen, and in addition there are similar formations along the back of the abdomen placed longitudinally and vertically.

Aquatic Arctia Larva.—Mr. M'Lachlan further remarked that in the Bulletin of the Proceedings of the French Entomological Society, at the Séance of the 28th January last, M. Guenée avowed himself much puzzled concerning the supposed aquatic larva producing a species of moth, described by M. Bar as Palustra Laboulbenei, which he considered was allied to the genus Cnethocampa. He thought further information very desirable, for all the characters of the insect were opposed to aquatic habits in any stage; and he suggested that the bubbles of air entangled in the hairs might be only expired air.

Spitsbergen Insects.—The Rev. A. E. Eaton exhibited a few Arctic insects which he had brought from Spitsbergen. Amongst others were a Trichopterous insect, probably Goniotaulius arcticus, *Boheman*, and also some Lepidoptera, Plutella Cruciferarum, the larva of which feeds on a species of Draba and a species of Phycita, near to Sub-ornatella. They were mostly collected on the higher parts of the hills, where there was a very small amount of vegetation. He also exhibited several excellent photographs, illustrative of the scenery of those desolate regions, and pointed out some depressions in the ground where patches of stunted willows grew, from which he obtained specimens of a kind of sawfly.

Cassida vittata.—Mr. Champion exhibited a specimen of Cassida vittata, taken by Mr. Walker near Chatham. The red colour was of peculiar brilliancy when alive, though its brightness had since somewhat faded.

Insects Injurious to the Coffee Trees.—A further communication was received from Mr. J. V. Gooch respecting the injury to the coffee trees, in Natal, from the Longicorn beetle, Anthores leuconotus, *Pascoe*. Mr. Gooch remarked that he was disposed to think that the plants were suffering from fungus before they were attacked by the insect, and stated that the ground into which the coffee-plants had been put contained a large number of decaying roots of the trees which formerly stood there for ages, and that when cleared for planting with coffee these roots were carelessly left in the ground, though, at the time, there was no idea in the minds of the planters as to any injury being likely to arise from them. He had drawn his son's attention to this point, and he hoped before long to obtain some information which might prove of interest to the Society, and which he would not fail to communicate to them.

New Parts of 'Transactions.'—Part V. of the 'Transactions' for 1873, concluding the volume, was on the table; and also Part I. of the 'Transactions' for 1874.

Euryporus picipes.—Mr. Champion exhibited specimens of Euryporus picipes taken near Chatham, by Mr. Walker.

Locusts devouring Woollen Materials and Leather.—Mr. Smith directed attention to an article in 'Household Words' of 30th December, 1855, in which a description was given of the ravages of locusts, and stating that the locusts devoured

woollen materials and leather, a fact of which he was not hitherto aware.

Zoological Nomenclature.—At the request of Dr. Sharp the Secretary read the following note:—"I find that in his Address, at the recent Anniversary Meeting of the Society, the late President noticed a pamphlet recently published on the subject of Zoological Nomenclature. In this notice the President states that Dr. Sharp proposes to have 'three names for each species.' This statement, however, not only does not represent what I propose, but is calculated to convey such a misconception about my propositions that I do not think it would be right to allow it to pass without observation from me. So far from having 'three names for each species,' it is my object to have but one name for each species. I do not consider it desirable that the classificatory name shall be used at all as a part of the name of a species. And the main object of the pamphlet, noted by the learned President, is to facilitate the complete separation of species nomenclature from classification nomenclature. Till this object be attained there can be no solution of the nomenclature question; and the only way of obtaining it is either to establish a separate mononymic system of species names, or to adopt the compromise proposed by me."

Death of Mr. Deane.—On Saturday, the 4th of April, Henry Deane, of Clapham Common, a most painstaking entomologist, but unknown as a collector of insects, died suddenly of heart disease, in his sixty-seventh year, at Dover, whence he was about to embark for the Continent. I can scarcely over-rate the ardour or thoroughness with which Mr. Deane investigated subjects of natural Science: as an instance of this I may mention that when in 1872 the question of the food of Syrphidæ was agitated, and it was discovered that these flies fed on dry pollen granules, Mr. Deane was the only naturalist in the kingdom who condescended to consider the question. He possessed one of those rarely candid minds which aims simply at the discovery and promulgation of truth, entirely careless how it may interfere with hypothesis. He saw almost at the first glance that it was simple pollen granules that distended the abdomens of these flies; and then he traced the reception of these granules into the

mouth, and their passage through the long, leathery haustellum, or promuscis, into the œsophagus and stomach, there to constitute the support of these flower-loving flies. I have before me a most interesting autobiography of this excellent naturalist and kind man, and from this I have made the following brief extract:—"I was born at Stratford, in the parish of West Ham, Essex, near London, on the 11th of August, 1807. My parents, Moses and Elizabeth Deane, being members of the Society of Friends, I was brought up in that persuasion, and continued a member thereof until my marriage in 1843. For nearly the first eleven years the only sound instruction I received was from my beloved parents. Although I was sent to what was considered a good day-school, in the immediate neighbourhood, I have a most distinct recollection of its utter inefficiency as a place for communicating even the merest rudiments of knowledge, and it was not until my father sent me to a school at Epping that I had the slightest idea of what it was to be systematically taught, and to know the value and pleasure of learning. Amongst my schoolfellows were Henry and Edward Doubleday, who have since attained a world-wide notoriety as entomologists. I was occasionally favoured with an invitation to go home with them to tea, occasions which were highly prized, as affording opportunities for seeing their collections and illustrated books of Natural History. From collecting insects, collecting plants and drying them—without regard to names, but for their intrinsic beauty—seemed naturally to follow. Thus habits of observing the beauties of creative wisdom were early fixed in my heart, and I often look back with thankfulness to that now far distant day when my friends the Doubledays sowed that seed which was to keep out many temptations to evil, and prove such a lasting source of pure enjoyment." When sixteen years of age Mr. Deane attended a series of lectures on Natural and Experimental Philosophy, at the Mathematical Society's Rooms in Crispin Street. These were so admirably delivered, and made so deep an impression on his ardent mind then thirsting for knowledge, that they constituted, as he himself tells us, a turning-point in his life; and although afterwards for many years assiduous at his business of chemist and druggist, he never lost his intense love for natural Science up to the hour of his death.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 130.] JUNE, MDCCCLXXIV. [Price 6d.

Gortyna flavago and its Householding. By Edwin Birchall, Esq.

Truly there is nothing new under the sun. We look for knowledge, but what we mostly find is our own ignorance. Every collector is familiar with the larvæ of Gortyna flavago: in many parts of England it is difficult to cut open a thistle-stem in July or August without finding its traces. The moth emerges from the pupa in September, quickly deposits its eggs, and dies; and there, until lately, my knowledge ended. None of the published histories of the insect, that I have seen, carry the matter further, or state in what condition, or where, the insect exists from September to June. The egg is said to be laid on the stems of burdock, thistle, &c. ('British Moths,' *Newman*, p. 280); but as the old thistle-stem dies down in the autumn, and a new one does not appear for many months, there is an evident want of continuity in the chain of circumstances, and it is left open to conjecture whether the female moth hybernates, or if the egg is deposited in the autumn, when the larva hatches, and what becomes of it, till thistles and June come round again. I have been able this spring to fill the gap in the history of the insect; but a kind friend having given me a copy of the works of Christian Sepp, and finding that he knew all about it one hundred years ago, I prefer that he should tell the story in his own quaint way, and hope that your readers will find pleasure in perusing the account of a "Morning's Collecting in the Last Century." Unfortunately, Dutch is a language with which few Englishmen are familiar, so I venture to offer a translation. The work is entitled 'A Description of God's

Wonders in the Least-noticed Creatures; or, Netherland Insects in their Remarkable Householding, Wonderful Transformations, and other Peculiarities worth Knowing.' Described from own observations, pictured after life, done in copper, and coloured by Christian Sepp: printed at Amsterdam, 1762.

"No. 1.—*The Gold-cloth Night-flyer* (De Goudlakens nacht-vlinder).—The name of gold-cloth has been given to this beautiful insect, because it seems at first sight to have some similarity to the so-called gold-cloth hen. Possibly many collectors may not yet know this insect, at least not its derivation; I doubt not then that it will be agreeable to them for me to try to give its history as a topic of the present treatise. In the following manner I have got at the whole householding of this insect. In the latter part of June, 1760, I was busy with my son, outside the town a little, seeking insects, when he found in the stalk or stem of a burdock-bush (klisse-struick) some round holes, which we guessed were made by some insects, and that these might possibly still be hid therein: he cut the stalk off,—but how unlucky, and yet lucky, was this cut, for it went right through the body of a caterpillar! and this grieved us certainly not a little; the joy, however, over this new discovery soon caused us to forget the loss, and to strive so much harder after more of such-like 'hermits' (or shall I call them pith-eaters?); consequently we found that day other five of these caterpillars in the burr-stems: they were all well grown; we took care not to disturb them in their dwellings, and we brought them safe home; but of these five, only one of them pleased us by turning itself into a pupa and by becoming a fly. That same summer the other four died. Thus far, then, we had discovered this insect, but that year there was no chance of learning to know it from the egg, so we were forced to wait till next year.

"No. 2.—June having come round again we again got some of these caterpillars, which were not yet full grown; we did not delay to give them always fresh burr-stems, and had the pleasure of seeing enough of them changed into pupæ, and then into flies. Consequently it happened that in the month of September a male and female fly one day happened to appear at the same time, and we put them by themselves into

a box to pair, and that this happened appeared by the issue. The female laid on the 20th of the month one hundred and twenty-one little eggs; further, other thirty: they were set here and there by heaps, and fastened with a shining humour or glue, appearing in their natural size and colour like *a*, fig. 1, table iii.; to the naked eye they seemed smooth and shining, but through the microscope they looked a little rough. At the elapse of eight days they changed colour and became somewhat darker, but at the same time they became crumpled and withered, a proof that they were not wind-eggs, but fruitful: they remained thus all winter.

"No. 3.—April 18, 1762, the caterpillars came out of the eggs; the day before, the eggs were blacklead-coloured (potloot kleurig), and to the last as transparent as glass, so that I could see the grubs in them with a microscope of two lines focus: at '*c*' I picture an egg of this sort thus magnified. The grubs when hatched were very nimble and cheerful, and of the size like '*d*.' They stretched themselves also (ze spanden toen noch), that is, they used only twelve feet in walking, but I could see with a good magnifying-glass that they had already sixteen feet. At first sight they seemed to be of a brown colour, but when I looked at them through the microscope (with an armed-eye) they seemed yellowish with brown rings, black head, and horny shields (dierge lyke schildjes) behind the head or on the first ring. They did not eat up the empty shells of their eggs. I gave them at first burr-leaves, for there were no burr-stalks grown yet, but they let the leaves lie untouched; on the contrary, they made themselves holes in the stems of them, and thus made ready a way to the inside, where they found their food, with which also they helped themselves until we could give them stalks. But since these grubs, according to their way of living, always kept themselves hid in the aforesaid stalks, it was hard to observe how often they sloughed, and I have only been able to note with certainty that the first sloughing happened when they were eight days old. After this sloughing they walked on fourteen feet, and stretched thus still a little; but it was not long before they used sixteen feet in walking,—that is all their feet.

"No. 4.—Their food, as proved above, is the pith only of the burr-stems, and to get at it the caterpillar makes with its

mouth outside the stem a round hole, continually throwing the chewed stuff away till it gets to the pith, and like as the same goes in the middle of the stem, right up and down, so also the caterpillar must take its way along this channel, and, always going forwards, he makes thus a canal in it of the same width as his body: it does not turn itself round, but only creeps forwards, or it can move itself out afterwards, as I have figured at fig. 4. After the caterpillar, through continually eating away of the pith that continually stands before its mouth, lengthens the channel before it, it fills it behind with its filth, or excrement; and whenever it has thus eaten the stem empty up to the top, or other circumstances cause it to begin another, it leaves the former in the same way as it entered it, for it makes again another round hole, but now from the inside to the outside, and goes through the same elsewhere.

"No. 5.—The grub undergoes the above changes inside the burr-stem; but when it is about to become a pupa it does not creep into the earth like many other grubs of this kind (bende), but remains in its beloved cell: it has also the prudence to make the place where the change is to take place a little wider, or somewhat hollower, for as caterpillar they can stretch themselves out, and thus place themselves in a new channel, but that does not occur when they have become pupæ; besides, these are also somewhat thicker than the grub. Indeed, this is a wonderful idea in so small and contemptible a beast, and which it truly never found out for itself, but must draw our attention to the highest Wisdom and Might with feelings of reverence and awe. At fig. 5 I have pictured the pupa in a burr-stalk, and at fig. 6 a pupa out of the stalk in his natural form and colour: most are of this size, seldom greater, sometimes much smaller. They usually remain lying three or four months in the pupal state, and the longer they remain the darker they become. At last, when it has become quite ripe and is to come out as a fly, the wings begin to appear through the pupa-membrane one or two days before, and the rings of the pupa are visibly stretched out.

"No. 6.—The birth of the fly happens on the same wise, as I have more than once described it in the former part of this work. According to my observation the gold-cloth moths appear in the month of August, sometimes also, but seldom,

in September. At fig. 7 I picture a female at rest with outstretched antennæ, which, however, when quite at rest, they place close to their body. At fig. 8 we see a flying male. There is not a sufficient difference between their antennæ to distinguish in this case the male from the female (though this is in many sorts the best sign of sex), but the tail-end of the former runs out somewhat broader than that of the latter; the male has also a slenderer body than the female. Besides there is a remarkable difference between these moths in the liveliness of their colours, some being very strongly, others only paler, coloured; the marking of them is always the same, so that one does not observe the least trifles; they are not larger. I have chosen the largest for my drawing.

"Lastly.—I must append here a few remarks. (1) It does not follow that you can always see the holes in the burr-stalk through which the insect has entered, as the grub may have entered quite young, and consequently through an almost imperceptible hole. (2) In one stalk you sometimes find more than one grub, not side by side, but above one another. (3) For the safety of the pupæ, whenever you wish to allow them to remain in the burr-stalk till they come out winged, you must split the stalks at one end and stick a little wedge in, otherwise through the shrinking of the stalk the channel, or lane, in which the pupa lies, will be narrowed, and consequently press it to death; you may also take them out of the stalks, and put them on cotton or other soft stuff."

EDWIN BIRCHALL.

Kirkstall Grove, May 15, 1874.

The Goat-moth Larva Underground.—The larva sent by P. E. is that of the goat-moth (Xyleutes Cossus); the smell has often been noticed as resembling that of a he-goat, and doubtless the name has reference to this peculiarity. This caterpillar has on several previous occasions been found in the ground, having buried itself to undergo its transformation. It is occasionally turned up by the gardener in his spring diggings, and is generally in a slight cocoon composed of earth and a small portion of silk. A life-history of the species, extending to sixteen pages, will be found at page 333 of the fourth volume of the 'Entomologist.'—*Edward Newman.*

Notes on the Wing-bones of the Two-winged Flies.

By Francis Walker, Esq.

(Continued from p. 102.)

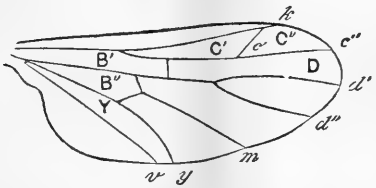
Bones.

j Mediastinal.
g Subcostal.
k Radial.
c Cubital.
c′ Cubital, 1st branch.
c″ Cubital, 2nd branch.
d′ Præbrachial, 1st branch.
d″ Præbrachial, 2nd branch.
m Pobrachial, 1st branch.
y Pobrachial, 2nd branch.
v Anal.
w Subaxillary.

Areolets.

R Subcostal.
K Radial.
C′ Cubital, 1st.
C″ Cubital, 2nd.
B′ Præbrachial.
B″ Pobrachial.
D Subapical.
Y Anal.

Fig. 13.—Plecia.



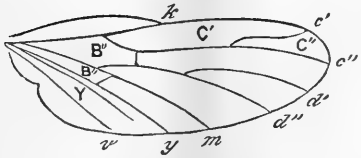


Fig. 14.—Penthetria.

Fig. 15.—Scatopse transversalis.

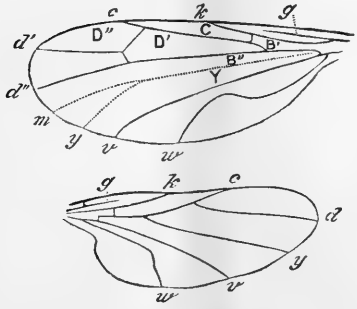


Fig. 16.—Aspistes.

Fig. 17.—Chironomus.

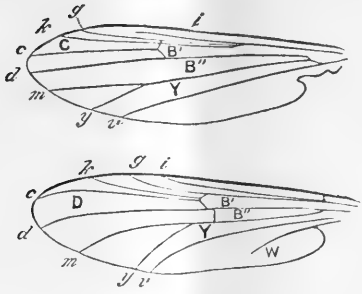


Fig. 18.—Tanypus.

Fig. 19.—Culex.

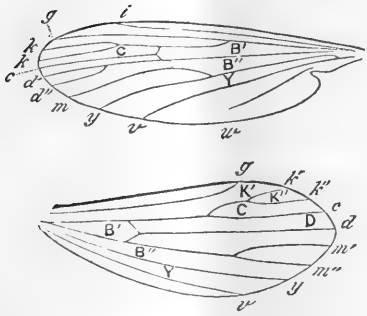


Fig. 20.—Phlebotomus.

Fig. 21.—Sycorax.

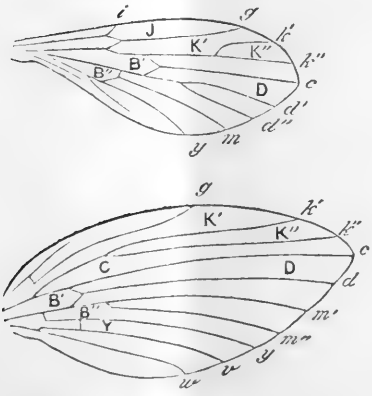
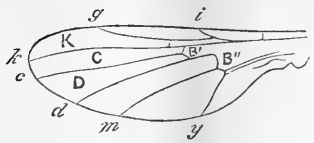


Fig. 22.—Psychoda (Pericoma).

Fig. 23.—Orphnephila.



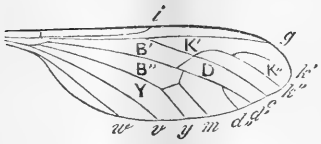


Fig. 24.—Dixa.

In Sciara the nearness of the cubital bone to the costa is apparent, and there is a transition through some intermediate forms between this genus and Cecidomyia, where the bones mostly disappear. In Bibio the arrangement of the bones is quite changed, and the new pattern is continued in the two following genera, Plecia and Penthetria (figs. 13, 14), where the cubital is forked. Penthetria differs chiefly from Plecia in the shortness of the radial, and in the junction of the first branch of the cubital with the costa, and not with the radial. In Scatopse (fig. 15), which is the type of the second division of the Bibionidæ, the cubital is again near to the costa, and is joined by a transverse bone to the first branch of the præbrachial, and there is an undulating subaxillary. In Aspistes (fig. 16) the structure is much more simple, and A. H. Haliday remarks that its analogy to that of Scatopse is very doubtful. In the Chironomidæ (figs. 17, 18) there is another plan in the formation of the bones: neither the cubital nor the præbrachial is forked, and the anal extends to a greater distance from the base of the wing; the hovering flight and the great swarms of some kinds of this family are well known. In Culex (fig. 19) another change occurs: the longitudinal bones are more numerous, and the passage from it by Phlebotomus (= Hæmasson, fig. 20) to the little moth-like flies (figs. 21, 22), whose abundance and feeble flight are well known in this country. I have placed Orphnephila (fig. 23) with the Chironomidæ, and Dixa (fig. 24) next to the Tipulidæ, as the formation of the wings agrees generally with that of Limnobia and of the neighbouring genera.

Francis Walker.

Entomological Notes, Captures, &c.

Pyrarga Egeria, &c.—Yesterday at St. Osyth I took five specimens of Pyrarga Egeria. This species is quite rare in this part of the country now. It was more frequently to be met with formerly, but I have never found it common, and none of my numerous correspondents seem to obtain it in any numbers. In most of the books on butterflies it is stated to be quite a common species, and I have often wondered whether this is one of the numerous errors which one author has been in the habit of copying from another, or whether—so far as the country generally is concerned—it is an actual fact. Perhaps Egeria is one of the species which has become scarce of late years, for, hereabouts, it seems wholly to have disappeared from several localities where it was formerly to be met with, and in the few places where it still lingers it is so seldom to be seen that I cannot help regarding the traditions of its former abundance with some amount of scepticism. I also took T. punctulata yesterday; and this morning, to my surprise, found a fine pair of N. trepida out in one of my breeding-cages. Considering that my pupæ are kept out of doors, this seems very early. I am now breeding some lovely specimens of N. Carmelita and S. certata, and have recently bred a considerable number of A. prodromarius, S. opima, and other species. Hybernated Polychloros are very abundant this season, and the same may be said of other hybernating species.—*William Harwood; Colchester, April* 22, 1874.

Liparis auriflua, &c.—I wrote you (Entom. vii. 22) relative to nests of L. chrysorrhœa (or, as I then thought, Auriflua), enclosing a specimen. Since then Mr. Doubleday has received some from me, and he concurs in the identification, and adds, in a note to me, that he believes Auriflua is not social throughout the larval life, as a rule. The colonies of Chrysorrhœa do not, I find, breed up in the spring, but a new abode is formed of enlarged size. Apparently they separate after the last ecdysis, as might be expected. There is a great difference of size noticeable, some broods being now only half grown, or hardly that; others past the final ecdysis. A question of interest occurs to me with regard to this insect, and one you can better pronounce upon than I can venture to do. How far are the published accounts reliable, as regards the details they profess to give, of the injury done by the

brown-tail to fruit-trees in other days? My own impression has been always that these are exaggerated, both in the case of England and the Continent. Now here, at Gravesend, we are encompassed by fruit-producing districts,—at Higham, Singlewell, Southfleet, and Green Street Green, are large orchards of pear, apple, plum, and cherry. The increase of L. chrysorrhœa, to be injurious to these trees, would be serious. At present, I find no signs of them on fruit-trees; these nests described to you are all on three lines of hedge, running near each other, about a mile from Gravesend. The larvæ are evidently most inclined to feed on hawthorn, though some have colonized the blackthorn, and even the bramble. It would probably be an easy matter to collect and burn two hundred nests, which, at the moderate average of thirty to a nest, might represent six thousand larvæ; yet, for my own part, looking at the thing with a naturalist's eye, I should not like to suggest it, unless it really ought to be done. I can hardly see that the insect is one that calls for such interference.—*J. R. S. Clifford;* 120, *Windmill Street Gravesend, May* 11, 1874.

[I have often thought the accounts of the brown-tail moth, as given in that most choice of all Natural Histories, Kirby and Spence, rather surprising: "The oaks, elms, and whitethorn hedges, looked as if some burning wind had passed over them and dried up the leaves." Now I have seen something of this appearance produced on the oak by Tortrix viridana, and on the whitethorn hedges by Yponomeuta padella, but never by Liparis chrysorrhœa. Then again it is said, as regards leaves, these larvæ "ate only the upper surface," and "they devoured the fruit," both of which statements are contrary to the usual habits of the larvæ in question. Then it is stated that "churchwardens and overseers burnt the caterpillars by bushels." It would puzzle these gentlemen, even when assisted by the most energetic of beadles, to collect a single bushel of caterpillars. All things considered, I quite agree with Mr. Clifford that these statements may fairly be challenged.—*Edward Newman.*]

Dianthœcia albimacula Bred: Description of the Larva. —I send you a short description of the larva of Dianthœcia albimacula, which I captured off Silene nutans last summer. The above plant formerly grew in abundance in this locality,

but as its habitat had been destroyed I had given up, after several years' search, all hope of again seeing it. However, accident revealed what careful search had failed to discover. In the autumn of 1872 I had rambled several miles from home, and was sitting down boiling my tea with the help of a spirit-lamp, when at my feet and around me I discovered the dried capsules of my old friend in a new locality, and many of them bore unmistakable signs of having been eaten out by some Lepidopterous larva. After I had enjoyed my tea I set to work pupa-digging, but without success, so was reluctantly obliged to abandon the search until last summer (1873), when I again made a pilgrimage to the locality, and then had the good fortune to find the plants in flower, and to collect from them several larvæ, some of which I knew to be the larvæ of Dianthœcia carpophaga; the others were unknown to me. I succeeded in rearing from them several healthy pupæ late in the year: these I have kept in a warm room, and last autumn one specimen of D. carpophaga emerged, and two others the beginning of April, and on the 28th of the same month a fine specimen of D. albimacula made its appearance. This morning I had the pleasure of seeing the second specimen drying its wings. I do not care to make the locality public until I find how its food-plant is distributed, as an eager collector might, so far as I can see at present, clear the whole of the plants in the course of one visit, and I should not like to see it served as some of my hunting-grounds have been by ruthless hands. When young the caterpillar conceals itself in the seed-capsule, and, as it grows older, at the root of the plant, crawling up after the sun has set, to feed on the unripe seeds. When full-fed it is about one inch and a quarter, long, tapering slightly towards each end. The head is smaller than the 2nd segment, pale brown in colour, with four darker lines down the face; the colour of the body is pale ochreous-yellow, inclining to brownish yellow on the anterior segments. The points of a series of dark brown triangular marks form the dorsal line, and the legs of each triangle pass diagonally through two black dots on each segment, and reach almost to the spiracular line, which is waved, and dark brown in colour. The spiracles are pink, surrounded by a black ring, and over each is a black dot; the legs, claspers, and body beneath,

are yellowish white, and in some specimens the markings are very indistinct, and only indicated by a series of cloudy spots. It feeds on Silene nutans, on which plant I captured the larva last summer in this district. It will eat S. inflata and S. maritima, but does not appear to like either. When full-fed it descends beneath the surface of the ground, and spins a slight cocoon of silk mingled with grains of sand, &c., and in this changes to a pale brown pupa. The imago emerges in June; but a precocious individual has just put in an appearance (April 28) in my breeding-cage, the first British *bred* specimen of Dianthœcia albimacula.—*H. Moncreaff; High Street, Portsmouth, May* 6, 1874.

Economy of Phycis Davisellus.—A description of the full-grown larva of Phycis Davisellus has been already published, but as its earlier state has not been noticed the following information may be acceptable. The eggs of P. Davisellus are laid in July and August on young shoots of Ulex campestris, and as soon as the larvæ emerge they spin a thick net-work of silk round the branch, and under this feed until the approach of winter, when each forms for itself a close cocoon or tunnel of silk in which to hybernate. In early spring the larvæ lengthen these cases, and extend, as they increase in size, the silken web, feeding on the young buds and blossoms beneath it. On fine days they may be seen sunning themselves on the outer part of the web, but they retreat into their tunnels on the least alarm. The little companies of larvæ are very abundant in this district in winter and spring, and as the summer advances form conspicuous objects on the furze bushes. The larvæ cannot be dislodged by beating, and it is only by pulling their nests to pieces that their presence can be detected. The imago is figured in 'Morris's British Moths' as P. Palumbella, and under that name I have had it in my collection for several years.—*H. Moncreaff.*

The Dor-beetle at Work.—In the afternoon of Easter Monday I was rambling over the extensive heaths in this neighbourhood seeking specimens or information; the cold winds and frequent showers put the collecting of Lepidoptera out of the question, and the numberless footprints around the bog were an intimation that a search for lapwing's eggs would not be a very successful venture. As I stood upon a

grassy plot watching at some distance the headlong, tumble-down, dashing flight of the birds in question, I was surprised at the number of dead dor-beetles lying about at my feet, scattered here and there. On closer examination each of these defunct beetles proved to be but a shell—so to speak—of its former self, the soft parts of the body having all disappeared most probably in the ants'-nest at no great distance, many members of which association formed a foraging party amongst the grass-stems, notwithstanding the inclemency of the weather. I furthermore observed that this small, sandy greensward was a regular nursery for the beetle above named, and that its soft spongy surface was tunnelled in many places, and in the choice of such a site the beetles had exercised no small amount of wisdom, for not only was the nature of the ground peculiarly adapted for their "borings," but the droppings of the rabbits, which came to feed upon the grass at night, made such a situation doubly convenient, for here was food for their future offspring close at hand, and, more than that, the pellets were ready made. Several beetles were busy collecting these pellets; one of these I watched more closely than the rest, and its mode of procedure was as follows:—the tunnel at which the creature was working was surrounded with a small, sandy mound, caused no doubt by the throwings out during the excavation; at the base of this mound several pellets of dung were lying, as the beetle did not dispose of them down the tunnel as it brought them, but collected several before they were drawn up the side of the so-called mound to be rolled into the tunnel. Whether these pellets were discovered by scent or sight I could not satisfactorily prove,—possibly by a combination of both,—but most of us are aware that the olfactory organs of these creatures are very acute. In searching for these pellets the beetle invariably went in the same direction, and on finding one it seemed to be recognized by an application of the palpi: the pellet was then seized by the two fore legs, the hooks and pointed projections—of which the use was very apparent—holding it firmly, whilst the pellet was further steadied by the head of the operator. In this position it was dragged, the beetle going backwards in exactly the same track as it had come in its search, and it was surprising to see how tenaciously it held on to its prize, for in returning it often

fell backwards over some impediment or other, but the pellet in most cases was held firmly, although sometimes the beetle and pellet went tumbling over each other. If the beetle chanced to lose its burden it seldom searched for it again, but went off on the look out for another. Having accomplished the task of pulling some three or four pellets to the base of the mound around the tunnel, the next thing was to find the tunnel itself, which seemed to perplex the poor insect very much, for with the labour of collecting these pellets it apparently had lost the knowledge of the exact position of the tunnel, but after a longer or shorter search it was sure to find the desired aperture, when, thrusting its head and thorax therein, it would remain motionless for a few seconds, as if making sure that all things were right. It then proceeded to drag the pellets, one by one, up the side of the mound, and almost invariably the beetle fell backwards into the mouth of the tunnel with its load, which, being released, rolled instantly down the oblique gallery: this having been accomplished, the beetle would return to the mouth of its subterranean nursery and remain very quiet, as if resting from the fatigue of its previous exertions, before entering upon the labour of pulling up another pellet. I thus saw the creature dispose of eight or nine of these pellets, and at last left it resting in the mouth of its retreat; but whether the work of provision had thus been completed, or but partly fulfilled, I did not learn, but I believe I saw the commencement of the work, for when I first observed the tunnel I saw that just below its surface two galleries were excavated opposite each other and in divergent directions, but one of them was very shallow,—not more than an inch and a half deep,—as I could see its end; possibly this was commenced before the larger and deeper one, but some obstacle prevented its completion, and so the second had to be bored. I inspected several other borings, but each had only a single shaft, as it were; and one thing I wish to notice, with regard to the one upon which my chief observations are founded, namely, that the beetle seemed to be actuated by a sort of blind instinct throughout its proceedings, as the first three or four pellets in the tunnel rolled into the shallow chamber, which they almost filled, and yet the beetle never took the least notice of them there, but always entered the deeper burrow for a short

distance whenever a pellet was disposed of, regardless of its destination and position, thus reminding one of the story of the owl who laid its eggs in a nest with a hole in it, each egg falling through as it was produced. Another thing that struck me was the immense amount of muscular power the beetle possessed, for it often hoisted the pellet quite off the surface of the ground over which it was pulling the treasure, especially when any more than common obstacle stood in its way.—*G. B. Corbin.*

[I wish Mr. Corbin had informed us the name of the beetle. Was it Typhœus, Stercorarius, or Sylvaticus? Again, I wish Mr. Corbin had given more precise information as to the cause of death: the presence of ants is not sufficient to account for the mortality. In walking over Woking Common I once took the pains to count the specimens of Typhœus which I found on the turf, and these were in the proportion of fifteen dead ones to one live one. Another common heath-species is often in the same disproportion. Did Mr. Corbin ascertain whether the beetles confined themselves to collecting pellets of rabbits'-dung? because this would be an interesting fact, and perhaps assist in determining the species. —*Edward Newman.*]

Pollen-eating Insects.—Entomologists who consider that a complete knowledge of insects consists in an acquaintance with their external form, doubt whether it is possible for insects, and especially for those which, like the Diptera, are not furnished with mandibles, to eat pollen. Indeed, I have been assured, by a well-known professor at one of our great seats of learning, that the thing is impossible, and therefore absurd. Nature, however, is of a different opinion from that of the learned professor as to its impossibility. Having satisfied myself long ago that Diptera are great consumers of pollen, I was pleased to find a full confirmation of the fact in the writings of the German botanist and entomologist Hermann Müller, of Lippstadt, who has paid more attention to the mode of fertilization of different kinds of flowers than any other living naturalist. In his book, 'Die Befruchtung der Blumen durch Insekten,' will be found, by anyone who can read German, a full description, accompanied by admirable drawings, of the various contrivances by which this is effected. The pollen-eating propensities of the

Diptera I have found at present almost confined to the Syrphidæ. In my own little garden, and in the gardens of the Royal Botanic Society, in the Regent's Park, I have been in the habit, during the last few summers, of capturing specimens of the two most common species, Eristalis tenax and Syrphus clypeata, eviscerating them, and examining the contents of the abdomen under the microscope, which I found to be coloured a bright orange, by the presence of enormous quantities of the peculiar spined pollen-grains characteristic of Compositæ, and evidently obtained from the various species of Aster, over which such numbers may be seen hovering. That they are not accidentally taken up, but form an actual article of food for the flies, is sufficiently proved by finding them in every stage of digestion, the fluid contents of the pollen-grains being apparently the nutritive substance, and the skins being ultimately excreted. Specimens of several species of Muscidæ, captured on the flowers of the Aster, when examined in the same manner furnished only a very few grains of pollen, apparently sucked up accidentally through the proboscis with the fluid food. During the present spring I captured, on the flowers of the sloe, Eristalis tenax and Andrena fulvicrus (male and female). The abdomen of the former was full of pollen-grains, belonging to at least three kinds of plants,—the sloe, the dandelion, and some large triangular pollen-grains, apparently those of Fuchsia. The tubes of the latter species contained only a very few grains, as was also the case with the honey-bee, the pollen belonging in the latter case apparently to the dandelion. I was interested at the same time in watching the constancy with which insects visit only the same species of flowers on the same visit. In the case of a bank covered with the white dead-nettle, red dead-nettle, and ground-ivy, the white dead-nettle was visited only by one species of humble-bee, Bombus Pratorum and Anthophora retusa; the ground-ivy only by the hive-bee, except on two solitary occasions by the Anthophora; while the red dead-nettle was entirely neglected by both, the only insect observed to visit it being a butterfly, Vanessa Urticæ. An examination of the pollen carried away on the thighs of the hive- and humble-bees confirmed this observation, the pollen-grains of the three species named being particularly easy to distinguish by their colour:

that of the white dead-nettle being yellow; of the red dead-nettle, red; and of the ground ivy, white. Similar observations, as to the constancy of insects in confining their visits to the same species during the same journey, have been made by that accurate observer, Mr. Traherne Moggridge, in respect of a species of fumitory in the South of France.—*Alfred W. Bennett;* 6, *Park Village East, Regent's Park.*

[At page 60 of the first volume of the 'Entomological Magazine' is a review of Professor Rennie's "Alphabet of Insects," from which it seems evident the writer did not think professors infallible. I believe the fault then, as now, is to be found in the fact that professors and teachers of all kinds trust too much to books, and too little to observation. On the other hand, I think there may be an error in relying too exclusively on observation. Book-knowledge often serves to test and to rectify observations too hastily made, and is therefore of infinite value.—*Edward Newman.*]

A Parasite.—The different species of pheasants have some most remarkable parasites infesting them, and indeed there are few, if any, members of the vast creation which are free from the attacks of parasites in some form or another. I recollect finding one of extraordinary size upon a kestrel, and I may enumerate others, as the tiny brown creatures taken from a hen harrier, or the white elongated forms of those found on a sheldrake; however, I have no wish to generalize in such a way, unless I knew what the various parasites were, but I may mention one whose occurrence interested me more than usual. In the autumn of 1873 I had a long-eared owl sent me, and whilst inspecting it I fancied I saw some insect make a hurried appearance upon the breast of the bird, and as quickly shuffle out of sight amongst the feathers. I searched most carefully, but without success, and I had caught only a glimpse of the creature, which from its movements I thought was not an Acarus, even had its size not forbidden the belief, so I determined to secure it if possible, and the following day, after another close scrutiny, I found it under one of the bird's wings. It proved to be a Dipterous fly, with body of a greenish hue, and is, I suspect, one of the Hippobosca genus, for in its side-long movements, its tenacious hold, and general outline, it seemed to proclaim itself a relation of the "forest-fly." I subsequently obtained two

more specimens of the same fly from a longeared owl, which I preserved for a friend, in March. I may state that the green tint of the body soon disappears when the fly is immersed in spirits of wine. I never detected it on any species of bird except the owl above named, but I am informed by a friend that a fly somewhat similar, if not identical, abounds on grouse in the Highlands.—*G. B. Corbin.*

[I do not much hesitate in expressing an opinion that this parasite was Ornithomyia avicularia, but I shall at all times feel greatly obliged for specimens of any of this remarkable order of insects: they are certainly allied to Hippobosca, but as certainly not of that genus.—*Edward Newman.*]

Captures in the New Forest during parts of April, June, July, and August, 1873.—I paid four visits to Lyndhurst last season: on the first two occasions the weather was simply villanous, more especially at Whitsuntide, when a drenching rain, combined with a rather high and not very mild wind, rendered butterfly-hunting far from profitable, and larva-hunting by no means pleasant, owing to the saturated state of the bushes and trees: in spite of very favourable weather during my other excursions I did not do as well as I had hoped to do, and can quite endorse Mr. Tugwell's remarks as to the general scarcity of insects. As will be seen, however, I did not find sugar quite so unprofitable as he appears to have done, though it was not nearly so attractive as in 1871. I am indebted to Mr. George Tate, of Pondhead, for a knowledge of the locality where all my captures by means of sugar were made, and also for a great deal of other valuable information respecting the forest. The following is a list of my best captures. L. Sinapis was common in May and June, but owing to bad weather at the time of my visit I only succeeded in capturing a series. L. Sibylla, common. T. Rubi, one. L. Ægon, very common. N. Lucina, four. L. Testudo, one, beaten out of a beech tree. N. strigula, one very bad specimen, at sugar. C. miniata and L. mesomella, not rare. L. aureola, one, bred from larva. L. helveola, one. L. quadra, larvæ not uncommon in June, imago very rare; I only know of five having been captured, two of which fell to my share. E. cribrum, one. E. russula, one. L. monacha, very common the only day I was able to go after it. A. pro-

dromaria, one larva. B. roboraria, three (one at sugar). P. cytisaria, not common. H. auroraria, one. A. immutata, not rare. C. taminata, one. M. liturata, two. T. plumaria, abundant. L. sexalata, one. M. albicillata, not uncommon. P. cassinea, larvæ rare. N. chaonia and N. dodonæa, larvæ. T. derasa and batis, common. D. Orion, one, in fine condition, July 17th: Is not this rather late? L. turca, next to M. strigilis, by far the most common insect at sugar. C. Cytherea, just coming out when I left. A. caliginosa, very common. T. fimbria, a few larvæ; I did not see the imago. T. miniosa, larvæ not rare. H. contigua, four. H. dipsacea; I was too late for this species, and only took one. E. fuscula, one. C. promissa, just coming out when I left. Besides the above I took several common species not worth mentioning.—*Bernard Lockyer;* 179, *Camden Road, London, April* 27, 1874.

Zeuzera Æsculi.—In the garden here, on the stem of a small Siberian crab-tree is an orifice, from which the frass of some larva is thrown continually: the tree is but about four inches in circumference, the orifice about the size of a cedar-pencil. Will you or some of your correspondents be good enough to say if the insect is likely to be Æsculi, and if its capture in the imago state may be expected to appear this season?—*J. A. Tawell;* 30, *Compton Street, Islington, April* 23, 1874.

[The larva was certainly that of Zeuzera Æsculi; the moth will come out in June or July.—*Edward Newman.*]

Is Saturnia Carpini ever Double-brooded?—I write to you in reference to S. Carpini to ask you if that species is ever double-brooded, and if so whether it is unusual. I find, on referring to Newman's 'British Moths,' it is stated that the caterpillar feeds in August and September, the moth appearing the following April. I had some moths of this species last month, from which I obtained eggs about three weeks ago, and some of which have hatched to-day. I may mention that the eggs have been in a room in which a fire has been burning.—*G. W. Oldfield; Wadham College, Oxford, May* 15, 1874.

[Will correspondents kindly give their experience in this matter?—*Edward Newman.*]

Gortyna flavago at Horsham in October.—On the 15th of

last October I took two good specimens of this insect off the gas-lamps: they were flying with Xanthia Cerago, &c. I see that Newman gives the month of June in his 'British Moths,' p. 280. I also took one on October 7th, 1872. Would you kindly inform me if this is of frequent occurrence, or whether the moth is double-brooded? All three seemed fresh from the chrysalis; and I have never seen a June specimen.—*D. Price; West Street, Horsham, May* 7, 1874.

[Mr. Price will find a paper on this subject at p. 121 of the present number.—*Edward Newman.*]

Scotosia Certata.—I netted a specimen of this insect here, on May 11th, when the weather was raw and cold.—*W. Macmillan; Castle Cary, Somerset, May* 14, 1874.

Variety of Pieris Rapæ.—On the 15th of March, in the present year, a good specimen of Pieris Rapæ was found in-doors, at Billingford Rectory, East Dereham, Norfolk, at about half-past ten o'clock at night. It is one inch seven lines in the expansion of the wings; it has the markings of the ordinary Rapæ, but the wings on the upper side are of a dull yellowish tint, more so than I have ever seen in this species, whereas all the wings on the under side are of a yellow, very nearly as bright as that of the male Rhamni. Can you give me any information about this?—*E. S. Dashwood; Billingford Rectory, East Dereham, Norfolk, May* 2, 1874.

[I can hardly express an opinion from this description. The under side of Pieris Rapæ is yellower than the upper side; but a variety of this species is occasionally found of an intensely bright yellow on the upper side. The late Mr. Curtis possessed such a specimen.—*Edward Newman.*]

Supposed Death-watch.—The beetle sent is Dermestes murinus. It is not known to me as the author of that ticking which is called the "death-watch." If, therefore, the statement made by "A Good Observer" can be authenticated by a real name and address, it will be interesting and acceptable. Without such authentication I cannot publish it.—*Edward Newman.*

Gall of Andricus quadrilineatus (H.) *in Essex.*—This gall was first noticed as British by Mr. Traill last year (Ent. Mo. Mag. x. 39), who met with it at Aberdeen. I am now finding

it commonly here on the male flowers of the oak. Its occurrence first in a northern locality, and in a southern one when looked for, must tend to show that it is widely distributed over the country, and would no doubt be found to be so, were the Cynipidæ more studied by British entomologists. Dr. Mayr's description and figures of the gall will no doubt appear in a later number of the 'Entomologist.' I hope the reproduction of the excellent figures in his work will call entomologist's attention to the study of British galls, their makers, and parasites.—*Edward A. Fitch; Down Hall, Raleigh, Essex, May* 9, 1874.

Correction of an Error.—May I ask you to state that all the Aphides marked "females" in my list of desiderata, inserted in your May number, are required to be "winged females," except Schizoneura vagans, unless they should be oviparous females. Your readers are doubtless aware that Aphides occur under five forms, namely, as larvæ, pupæ, winged females, winged males, and wingless oviparous females. The three first are oviparous, and have incomplete sexual characters; the two last are to be regarded as the mature individuals of the series.—*G. B. Buckton; Weycombe, Haslemere, May* 5, 1874.

Extract from the Proceedings of the Linnean Society of London, March 19, 1874.

Dr. G. J. Allman, F.R.S., in the chair.

Economy of Bees and Wasps.—Sir John Lubbock read some "Observations on Bees and Wasps." The paper commenced by pointing out, with reference to the power of communication with one another, said to be possessed by Hymenoptera, that the observations on record scarcely justify the conclusions which have been drawn from them. In support of the opinion that ants, bees, and wasps, possess a true language, it is usually stated that if one bee discovers a store of honey, the others are soon aware of the fact. This, however, does not necessarily imply the possession of any power of describing localities, or anything which could correctly be called a language. If the bees or wasps merely follow their fortunate companions, the matter is simple

enough. If, on the contrary, the others are sent, the case will be very different. To test this, Sir John kept honey in a given place for some time, in order to satisfy himself that it would not readily be found by the bees, and then brought a bee to the honey, marking it so that he could ascertain whether it brought others or sent them, the latter, of course, implying a much higher order of intelligence and power of communication. After trying the experiment several times with single bees and obtaining only negative results, Sir John Lubbock procured one of Marriott's observatory-hives, which he placed in his sitting-room. The bees had free access to the open air; but there was also a small side or postern door, which could be opened at pleasure, and which led into the room. This enabled him to feed and mark any particular bees; and he recounted a number of experiments, from which it appeared that comparatively few bees found their own way through the postern, while of those which did so the great majority flew to the window, and scarcely any found the honey for themselves. Those, on the contrary, which were taken to the honey, passed backwards and forwards between it and the hive, making, on an average, five journeys in the hour. Sir John had also in a similar manner watched a number of marked wasps, with very similar results. These, and other observations of the same tendency, appear to show that, even if bees and wasps have the power of informing one another when they discover a store of good food, at any rate they do not habitually do so; and this seemed to him a strong reason for concluding that they are not in the habit of communicating facts. When once wasps had made themselves thoroughly acquainted with their way, their movements were most regular. They spent three minutes supplying themselves with honey, and then flew straight to the nest, returning after an interval of about ten minutes, and thus making, like the bees, about five journeys an hour. During September they began in the morning at about six o'clock, and later when the mornings began to get cold, and continued to work without intermission till dusk. They made, therefore, rather more than fifty journeys in the day. Sir John had also made some experiments on the behaviour of bees introduced into strange hives, which seemed to contradict the ordinary statement that strange bees are always recognized and attacked. Another

point, as to which very different opinions have been propounded, is the use of the antennæ. Some entomologists have regarded them as olfactory organs, some as ears, the weight of authority being perhaps in favour of the latter opinion. In experimenting on his wasps and bees, Sir John, to his surprise, could obtain no evidence that they heard at all. He tried them with a shrill pipe, with a whistle, with a violin, with all the sounds of which his voice was capable, doing so, moreover, within a few inches of their head; but they continued to feed without the slightest appearance of consciousness. Lastly, he recounted some observations showing that bees have the power of distinguishing colours. The relations of insects to flowers imply that the former can distinguish colour; but there had been as yet but few direct observations on the point.

Extracts from the Proceedings of the Entomological Society of London, April 6, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Andrena tibialis and Stylops.—Mr. Frederick Smith communicated to the Society the fact of his having captured seven specimens of Andrena tibialis, on Hampstead Heath, on the previous Friday, April 3rd, two being females and five males. One of the females had the exuviæ of two males of Stylops remaining in the abdomen, the other female had had one male of Stylops, and also a female which of course remained in the abdomen of the bee. Of the male Andrenæ, one contained two females, a second having one of the same sex remaining in its abdomen. Mr. Smith mentioned this circumstance to give collectors of Coleoptera an opportunity of capturing the rare Stylops; and recommended searching for Stylopized bees between the hours of nine and twelve in the morning, as, according to his experience, the Stylops always emerged from the body of the bee on the day on which the latter first quitted its nest, should the day be bright and sunny; and he also mentioned the fact of his never having captured a bee which had a male Stylops remaining in its abdomen at a later hour of the day than

twelve o'clock. He had himself bred Stylops five or six times, and had never done so later than the month of April, always having captured the attacked, or infested, bees early in the day. On one occasion he bred a Stylops on the same day on which he had captured the infested Andrena, conveying the bee home, shut up in a pill-box; then, on arriving at home, he had placed the bee in the sun, enclosed in a wooden box having a glass lid; when, in the course of half an hour, the Stylops quitted the body of the bee. On other occasions he had kept Stylopized bees in pill-boxes the whole of the day of capture, but on placing them in a good-sized glass-topped box, and supplying the bee with a few fresh flowers, the Stylops had emerged early the following morning. The President remarked that he had once found a large number of bees in the afternoon at dusk, some of which contained male Stylops, but on that occasion the morning had been wet and dull, and therefore the bees had probably only just made their appearance. Some further discussion ensued, during which the President stated that during flight the males do not move the rudimentary anterior wings (or "elytra").

Insects Destructive to Coffee Plantations.—Some further remarks were communicated by Mr. Gooch, of Natal, respecting the ravages of a Longicorn beetle in the coffee plantations there, which gave rise to a discussion as to whether the larvæ of Longicorn beetles attack healthy wood or not, a remark having been made by Mr. Newman in the 'Entomologist' that, according to his experience of fifty years, he had never found the larvæ of Longicorn beetles in decayed wood, or those of Lamellicorn beetles in sound wood. Mr. M'Lachlan stated that from his own observations healthy wood was not attacked by British species of the family, though there were exceptions, such as Saperda populnea. Mr. Smith remarked that he once attempted to sit upon a rail, which broke under him, when it was found to be infested with Rhagium bifasciatum, and was completely rotten; and the President had experienced the same thing in Turkey with regard to a chair, which was destroyed by Longicorn larvæ. Mr. Janson thought that the larvæ of Longicorns do not attack wood rotten from other causes; but Mr. M'Lachlan understood Mr. Newman's observation to refer to living and healthy trees.

THE ENTOMOLOGIST.

No. 131.] JULY, MDCCCLXXIV. [Price 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. Hubert Herkomer *née* Weise.

III. Bud-galls.

(On twigs that are two years old or more, or on the trunks.)

Cynips Hartigi.—This beautifully-shaped gall is developed from growing buds on the branches and stem of Quercus sessiliflora, chiefly on their under side: it appears as a half or three-quarter sphere of three centimetres in diameter; it is of a dark brown colour, tinged with bluish white; it has numerous short conical projections, and is firmly attached to the branch at the base by a very short foot-stalk. On detaching this gall from the twig the bud-scales are always found. A section of this gall exhibits in the centre a hard, white, spherical, inner gall, about the size of a pea, which is attached to the twig by a short foot-stalk; it always contains a single larva-cell; an exterior surface is covered with many small rugosities and shallow furrows; from each of the little excrescences issues a brown (at first green) stalk, about one millemetre in diameter, and from three to four millemetres in length; this stalk gradually thickens

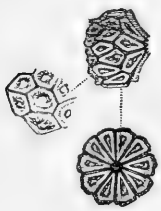
Fig. 10.

Cynips Hartigi.

into a club of the same tint; in appearance it resembles a blossom-bud, and is from four to seven millemetres in diameter, with a spongy interior, the upper extremity being conical, and terminating in a point; therefore as these conical projections constitute the exterior surface of the gall, and as each club radiates, they form altogether a spherical or hemispherical gall covered with short cones. The individual clubs are so closely fastened together that it is impossible to introduce the point of a pin into the gall without damaging its structure. When in a fresh green state, as I have found it in May, it may be readily detached, but the dead gall, when found at midsummer, is so hard and brittle that in attempting to cut or detach it in dry weather the clubs are very liable to separate and come off. The gall-maker has assumed the perfect state in December, but does not emerge and use its wings until the following March.—*G. L. Mayr.*

Cynips Truncicola.—This spherical gall is found, although rarely, on the branches and twigs of Quercus pubescens, and is always seated on growing buds. It is about the size of a pea, or perhaps a little larger; it is of a brownish black colour, with a deeply-furrowed surface; between these clefts the inner gall is frequently visible. The fissured part, covering the inner gall like a layer of bark, is remarkable for the somewhat symmetrical form which it assumes, appearing as equilateral triangles, meeting each other at central points: on the basal half of the gall this bark-layer is cracked into triangular, square, and sometimes almost circular, divisions. The interior gall is horny and thin; it has a rough, tuberculated surface, and contains one large larva-cell. Both my description and figure are made from type specimens, which Dr. Giraud had the kindness to send me. He thinks it possible that this gall may prove a crippled form of Cynips Hartigi.—*G. L. Mayr.*

Fig. 11.



Cynips Truncicola. Seen above and sideways, and with some magnified under-facets.

Notes on the Wing-bones of the Two-winged Flies.

By Francis Walker, Esq.

(Continued from p. 128.)

Bones.	Areolets.
j Mediastinal.	B Subcostal.
g Subcostal.	K Radial.
k Radial.	C′ Cubital, 1st.
c Cubital.	C″ Cubital, 2nd.
c′ Cubital, 1st branch.	B′ Præbrachial.
c″ Cubital, 2nd branch.	B″ Pobrachial.
d′ Præbrachial, 1st branch.	D Subapical.
d″ Præbrachial, 2nd branch.	Y Anal.
m Pobrachial, 1st branch.	V Subanal.
y Pobrachial, 2nd branch.	I Discal.
v Anal.	
w Subaxillary.	

Fig. 25.—Limnobia.

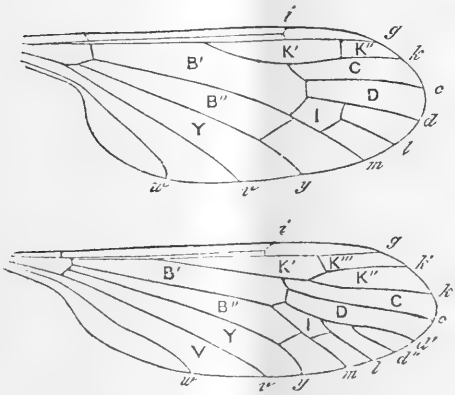


Fig. 26.—Limnophila.

Fig. 27.—Ptychoptera.

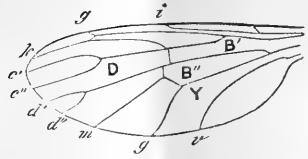


Fig. 28.—Rhyphus.

Fig. 29.—Sargus cuprarius.

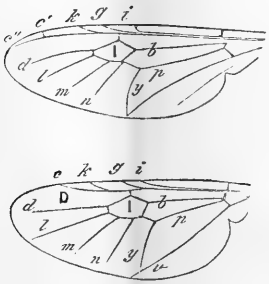


Fig. 30.—Nemotelus pantherinus.

In Limnobia and in Limnophila (figs. 25, 26) it will be seen that the general arrangement of the wing-bones is like that of Dixa, and that the præbrachial is forked in Dixa and in Limnophila, and is undivided in Limnobia. The numerous variations of these bones in Limnobia are considered as sections by Meigen, and as genera by more recent authors.

In this figure of Limnobia there are two radial areolets, and in that of Limnophila there are three, owing to the radial bone being simple in the former and forked in the latter. The discal areolet is absent in some sections or genera, and also in Ptychoptera (fig. 27). This genus differs much from Limnobia and Limnophila in the shortness of the præbrachial and the pobrachial areolets, and the cubital bone is forked, and the radial is approximate to the costa. In Rhyphus (fig. 28) the radial ceases much before the tip of the wing, and the discal areolet is very large. Sargus and Nemotelus (figs. 29, 30) are distinguished by the approximation of the mediastinal, subcostal, radial, and cubital bones, and by the more or less abbreviation of the hinder bones. In 'Diptera Britannica' the second branch of the pobrachial is the subanal, and the præbrachial and pobrachial are termed the first and second externo-medial. In fig. 27 the letter *d''* corresponds to *l* in fig. 28, where there is an intermediate bone (*n*) between the forks of the subanal.

FRANCIS WALKER.

Netherland Insects. Translated from the Dutch of Christian Sepp, by EDWIN BIRCHALL, Esq.

"DER DENNE PYLSTAARTE NACHT VLINDER."

The Fir-tree Arrow-tail Moth (Sphinx Pinastri).

§ 1.—IT often happens that the discoverer in the arts and in the sciences, whilst he is busy in some enquiry or other, unexpectedly by that means makes a new discovery in quite a different direction, of which he had before never once thought, let alone the seeking after it. Even so has it happened to the student of insects. Frequently one seeks an already well-known insect on shrubs where it should be found, and, behold! one finds, instead of that or of the like of it, a quite other, and sometimes a much more agreeable sort: a circumstance which causes this study to become so much more enticing. This very thing happened to me with regard to the present insect. In the autumn of 1763 I was with my son outside Naarden, at the great country house of *Kraailo;* seeking the grubs of the Anomalus-moth (Fidonia Piniaria) on the pine or fir-trees: we discovered on these trees, for the first time,

the caterpillars of the fir-tree arrow-tail moth. I cannot well express with words how delighted we were, and the more so as we supposed that this insect did not dwell at all in this country, but, as we knew already, in Germany. We found a small caterpillar on a fir-leaf, and observing that it had a horn on the tail we could come to no other conclusion but that it must be the caterpillar of the fir-tree arrow-tail moth, although somewhat pale; the smallness of the caterpillar showed that it had not escaped from the egg many hours. Through this new discovery, uncommonly encouraged, we became very zealous in searching for this insect, and found several of its eggs, but these were, to our sorrow, impregnated with strange eggs, and consequently perished: another new discovery,—a very strange phenomenon,—at which we wondered not a little; for that the caterpillars should be impregnated with eggs of wasps and flies, and thus become destroyed, was a well-known fact, but that the eggs also of some flies should have to submit to this lot seemed to us paradoxical and incomprehensible. I shall, further on, speak more on this subject, but must now consider the history of this insect. After some search we found other two of these caterpillars, the one much greater than the first and probably already twice changed, the other nearly full grown. These three caterpillars having been fed carefully with the fir-leaf, and having grown large, we saw, to our great delight, that towards the end of September two of them crept into the earth and became pupæ, but the third died still young. The two pupæ remained all winter in the ground, and on the 6th July following there came out of the one a beautiful and lively moth, but the other brought forth a so-called bacon-eater (being a certain kind of wasp), with whose eggs this caterpillar had been impregnated.

§ 2.—The complete house-holding of this insect, from the very egg to the last or flying state, was now sufficiently known to us, except that we had not yet seen any undamaged eggs; but in the year 1767, on the 12th July, we found two good eggs, out of which the caterpillars came on the 21st of the same month, which we brought up until they were almost full grown, when, however, they died. But in the following year, 2nd July, a great and eminent amateur gave us a still better opportunity of observing the house-holding

of this insect, and I openly express my thanks to him on that account. This gentleman furnished me with sixty of these eggs, together with the female fly which had laid them. On the 8th July all the caterpillars appeared. Five or six days before the caterpillar comes out the egg begins to change colour only, and becomes dark brown at the place where the head of the caterpillar is, then again slowly brighter, and at last as clear as glass, so that the grub is seen in it most plainly; and I have pictured it at fig. 2, as it appears under a good magnifying-glass. Not less plainly is seen the movement of the dark spot under the head, which is the mouth of the caterpillar. The little animal is then trying to make a little hole in the top of the egg, and as soon as this is big enough for it to put its head through, the little caterpillar creeps out of it. Just after it is born it is of a yellow colour, with a dark brown head, and has a white horn bent forward on its tail, but this shortly afterwards becomes coal-black, and is split above on the point, or rather it has there two fine little points, which anyone who is sharp-sighted can see with the naked eye. This just-born fir-tree arrow-tail grub is shown at fig. 3. Most of these little caterpillars, after they are hatched, let the empty egg-shell lie, without making any further use of it; some, however, ate it up greedily; some even were not satisfied with their own egg-cover, but consumed also those of others. After consuming this breakfast the fir-tree needles are afterwards their special food, when, being still young, they feed in the manner aforesaid, like the caterpillar of the Anomalus fly (Fidonia Piniaria), in that they eat more at the edges of the spines, but afterwards, when they have become older and bigger, they eat them off cross-wise, beginning from above at the point and going thus down, leaving often a morsel of the spine at the foot. The growth of this caterpillar lasts above four weeks, within which time they moult four times, usually about every six or seven days: at each moult they eat up all the cast-off skins. After the first change the caterpillar appears striped with green, like fig. 4; after the second and third moults the stripes become longer and more distinct, and the little horn still remains forked at the point, as is pictured at fig. 5, magnified; but after the fourth, or last change, the rosy stripe on the back and the narrow black rings first come in sight. The little horn,

which at the birth of the caterpillar was bent forwards, and after that stood almost straight up, is now bent backwards, and is no longer forked, but ends in one sharp point. Full grown, the caterpillar appears like fig. 6. Here I must observe that all fir-tree arrow-tail caterpillars are not exactly marked like this: on some the stripes run right through to the reverse side of the body, whilst here they are shown broken up into little patches; however, besides this, there is no other difference in the markings.

§ 3.—This insect, having completed its life as caterpillar, and being now about to undergo its first transformation, or become a pupa, creeps into the ground, and there makes this change, in the same way as I have already described this operation in the description of other arrow-tails. As pupa, it appears in the shape, size and colour of fig. 7, having this remarkable peculiarity, that the sheath of the sucker of the moth, which dwells in the pupa, is somewhat separated from the body, and scarcely stuck fast to it by the thick end, there being consequently a small opening between them. This is also the case with the pupæ of the "liguster" and bindweed arrow-tail moth, but not with others. The fir-tree arrow-tail pupæ remain all winter laid in the ground, and the moths come out late in the following summer. This second change occurs also in all points like that of other moths, so I need not make any further remark about it here.

§ 4.—Our fir-tree arrow-tail moth now having left the pupal membrane, and its wings having obtained their proper stiffness, appears, when at rest, like fig. 8, that being a female, which by its thicker abdomen alone is sufficiently distinguishable from the male, this latter being seen flying at fig. 9. The antennæ differ very little in the sexes, but those of the male are a little thicker and rather more downy. With regard to the marking of this insect, it seems at first sight to be always alike, but if one looks at it a little closer one finds here and there a little difference: the ground colour, namely, is not the same exactly in all; a property, which this sort has in common with by far most other sorts.

§ 5.—With regard to our new discovery about the impregnation of eggs of some moths with foreign eggs, of which I made mention in the beginning, I have not yet found anything like it in any describer of insects; consequently this

phenomenon must be quite unknown to them, as they give a full account of the impregnation of caterpillars with foreign eggs. At a time when we knew nothing about the impregnation of insects' eggs, we found some eggs of the fir-tree arrow-tail moth, which were blackish or iron-coloured, and these first caused us to suspect that something strange must have happened to them, for we well knew that the arrow-tail eggs had not this colour, either when empty or when full: therefore we looked at them very narrowly, and, behold, we discovered in each egg an uncommonly small hole, out of which it was impossible for a caterpillar to have crept. But what then? Without doubt, nothing else but one or more of the very smallest wasps. However, this was simply a guess; but the same day we were convinced of the truth of the matter, for shortly after we found one of these eggs, out of which apparently the caterpillar had come, and which was an empty shell, as clear and white as glass, the hole or opening therein being proportionately wide to the size of the caterpillar, which had made its escape through it. This strengthened not a little our guess; but what settled the matter was this, namely, we discovered on a fir-spine seven small eggs of the moth, whose caterpillar is called the jumping-caterpillar ("spring-rups"). They are as big as the smallest pins'-heads, or so-called gnat feet: these eggs were likewise iron-coloured, and, looking very closely at them, we saw also in them a right small hole, out of which no caterpillar could have come; immediately afterwards we found a small shoal of these eggs on an oak-leaf, having the same quality; but luckily there were some of them which had not yet any hole in them. These we kept, when we got home, in a glass well pasted up at the top; and, behold, in two days the wasps actually came out of them, uncommonly small, yellow in colour, with round shining wings. The affair was settled; and the fact was proved, by this discovery, that the eggs of insects are impregnated with the seed or with the eggs of other insects, and thereby destroyed.

§ 6.—Just consider how small an egg must be which is of the size of the very smallest pin's-head; how, beyond measure, small the little hole therein, out of which the little wasp has crept,—so very small, that it can hardly be detected by the sharpest sight; how uncommonly small the wasp;

and, besides that, beyond all imagination, how unspeakably small the eggs of these wasps, and the holes they make by the ovipositor in the shell of the egg, through which they shove their eggs. Just consider how, in all these trifles, a perfect Omnipotence reigns. But what does it matter to us, some light spirit may ask, that we know and think about this: could we get anything useful out of it? I reply—Yes, certainly! For, first, whenever we contemplate such marvellous wonders, the question forces itself upon us—Who can have brought these all so perfectly to pass, and ordered it so wonderfully? The answer can be nothing else but—Surely an Almighty God! Would not this bear us up, and sustain us when wavering in the faith? In the second place, there flows from this truth that the wonders of God are not less unspeakably great in the smallest trifles than in the greatest phenomena of Nature; so that it may well be said—"EMINET IN MINIMIS MAXIMUS ILLE DEUS."

Notes on the Macro-Lepidoptera of Lübeck. By ARTHUR W. PAUL, Esq.

ON perusing the title of these few remarks, the mind of the reader will naturally revert to the Baltic shores—the home of our Saxon forefathers—and to the fine old town, the capital of the republic, bearing the same name, which some four hundred years ago held an important position amongst maritime cities, by virtue of its being at the head of the Hanseatic League; and the Senate, composed of the deputies from eighty-nine free cities, which met within its walls, assembled to lay down the law,—certainly as far as commerce was concerned,—which was recognized by the sea-ports of Northern Germany and of the adjacent countries. That was a time when Lübeck could look down upon her sister city, Hamburg, with feelings of superiority and pride; but Fate the inexorable, in her dealings with nations, has made Lübeck no exception to the general rule; and the dissolution of the Hanseatic League in 1630, together with the mischievous results of French rule from 1810 to 1813, have done much to humble the once powerful city; and from having a population of two hundred thousand souls, with a position as a sea-coast

town second to none in Europe, it has sunk to a provincial town with barely thirty thousand inhabitants.

This is not, however, the place to enlarge upon the historical features of bye-gone times; and my endeavour now will be to enumerate, as far as the experience of a single season will allow me, the Lepidopterous insects to be met with in the district.

The greater part of Lübeck territory (one hundred and ten square miles in all) consists of forests. These are of two kinds: the pine forests, which consist of large tracts of land planted with the common pine (Pinus sylvestris), interspersed here and there with small clumps of larch, and intersected with rough grassy roads; and secondly, woods, more like those we are accustomed to see in England, composed entirely of deciduous trees, with wide breadths of underwood flourishing beneath them. One misses, however, the gigantic form of the lord of the English forest—the oak, which never attains the size it reaches in England; but this is in part compensated for by the magnificent lime trees to be found commonly in the neighbourhood, and of dimensions which we never meet with in this country.

With these few cursory observations I will proceed with my subject; but I would first remark that the list which follows is far from large, and must not be taken by any means as exhaustive of the subject; still, as far as it goes, I think reliance may be placed upon it, as nothing is stated excepting from my own experience, or on authority which I know to be unimpeachable. The Noctuæ named are few in number: this is owing to my not having had recourse to sugaring; had I followed out this method, without doubt the number of species would have been considerably augmented. Commencing then with Diurni, the first on the list is—

Argynnis Paphia.—Abundant in woods. I had the good fortune to capture a specimen of the dark variety, Valezina: this is far from common.

A. Aglaia.—Common in grassy openings in the woods; flying only in hot sunshine.

A. Niobe.—Local, and in no particular abundance.

A. Adippe.—Common.

A. Lathonia.—Common everywhere; quite a garden insect; where met with in woods preferring rough pieces of

ground devoid of vegetation, and to all appearance very unattractive.

A. Euphrosyne and A. Selene.—Met with in abundance.

A. Ino.—Tolerably common; no doubt often passed by as Euphrosyne, which it so closely resembles.

Melitæa Cinxia.—Local, and not superabundant.

M. Athalia.—Local, but most profusely abundant where it occurs.

Vanessa Urticæ, V. Polychloros, and V. Io.—Common.

V. Antiopa.—Generally considered a rare insect; but in the autumn of 1872 it put in an appearance in some plenty. I met with some hybernated specimens in the spring of 1873, but none in the autumn of that year.

Pyrameis Atalanta and P. Cardui.—Not common.

Limenitis Sibylla.—This beautiful species is to be met with in tolerable plenty.

Apatura Iris.—Not common; only to be found in one wood.

Erebia Medea.—Scarce.

Pyrarga Megæra.—Common.

Epinephele Janira, E. Tithonus, and E. Hyperanthus.—Common; the last named especially so.

Chortobius Pamphilus.—In abundance.

Thecla Quercus.—Said to be common, but I never met with it.

T. Ilicis.—Very abundant.

Polyommatus Phlæas and P. Dorylas.—Common.

Lycæna.—Of this genus I met with few species: Medon, Icarus, Adonis, and Argiolus, I believe to occur in tolerable abundance.

Colias Hyale.—Not uncommon.

C. Edusa.—Scarce.

Rhodocera Rhamni.—Excessively abundant.

Papilio Machaon.—Variable; some seasons very common, at others comparatively scarce. The larva is found commonly feeding on carrot in gardens, and it appears to be by no means exclusively a marsh insect, as in England.

P. Podalirius.—This is sometimes common, but I did not meet with any.

Leucophasia Sinapis.—Scarce.

Anthocharis Cardamines.—Very common.

Pieris Daplidice, P. Napi, P. Rapæ, and P. Brassicæ.—Common.

Aporia Cratægi.—Considered scarce. I caught two specimens only, but no doubt passed by many more, taking them for pale specimens of R. Rhamni, which was very abundant at the time.

Hesperia.—Of this genus I know Malvæ, Sylvanus, and Linea, to occur commonly; Comma is also said to be met with, but I cannot speak from experience.

Smerinthus ocellatus and S. Populi.—Tolerably abundant.

S. Tiliæ.—Very common.

Acherontia Atropos.—Not common.

Sphinx Convolvuli.—As in England,—uncertain.

S. Ligustri.—Common.

S. Pinastri.—Common in pine forests.

Deilephila Euphorbiæ.—Not to be met with in Lübeck territory; but on the Harburg side of the River Elbe, not far from Hamburg, this species is said to occur commonly.

Chœrocampa Elpenor and C. Porcellus.—Not common.

C. Nerii.—Very scarce.

Macroglossa Stellatarum.—Tolerably abundant.

Zeuzera Æsculi.—Scarce.

Cossus ligniperda.—Not common.

Hepialus hectus, H. lupulinus, and H. Humuli.—Not uncommon.

Limacodes Testudo.—I caught two specimens.

Zygæna Loniceræ.—Common.

Z. Filipendulæ.—Very common.

Lithosia mesomella.—Common.

L. aureola.—Not uncommon.

L. quadra.—Scarce.

Euthemonia russula.—Common.

Liparis monacha.—Very common. Any quantity might be taken, in the season, at rest on lime tree trunks during the day.

Orgyia pudibunda.—Common.

Bombyx Rubi.—The larva very common in the autumn, feeding on clover.

Endromis versicolor.—Very scarce.

Epione vespertaria.—Common where it occurs, but I could find only one locality for this exquisite little "beauty."

Venilia maculata.—Very abundant.
Eurymene dolobraria.—Common.
Pericallia syringaria.—Tolerably common.
Selenia illustraria.—One specimen.
Ennomos angularia.—Not uncommon.
Biston hirtaria.—Common.
Amphydasis prodromaria.—Scarce.
A. betularia.—Common.
Cleora lichenaria, Tephrosia crepuscularia, T. extersaria, Ephyra porata, and Acidalia ornata.—One specimen of each.
A. emarginata.—Local, and not abundant.
Timandra amataria.—Very common.
Cabera pusaria and C. exanthemaria.—Very abundant.
Corycia taminata, Macaria liturata, M. notata, and Numeria pulveraria.—One specimen of each.
Fidonia atomaria.—Common.
F. piniaria.—Very abundant in pine forests.
F. pinetaria.—One specimen.
Lythria purpuraria.—Very common.
Lomaspilis marginata.—Common.
Hybernia leucophearia.—One specimen.
H. progemmaria.—Very abundant.
Lobophora lobulata.—One specimen.
Melanthia albicillata.—Common.
M. subtristata.—Abundant.
M. montanata.—Very common.
Anticlea badiata.—Common.
Scotosia certata and Cidaria ribesiaria.—One specimen.
Eubolia mensuraria.—Very common.
Platypteryx hamula.—Scarce.
Dicranura vinula.—Not uncommon.
Notodonta camelina and N. Ziczac.—Common.
Acronycta Aceris.—Very common.
Leucania lithargyria.—Common.
Cerigo Cytherea.—One specimen.
Tryphæna orbona and T. pronuba.—Very abundant.
T. fimbria.—Not so common.
Tæniocampa miniosa.—One specimen.
Xanthia cerago and Miselia Oxyacanthæ.—Common.
Agriopis Aprilina.—Abundant.

Brephos notha.—Commonly met with in the woods, flying in the sunshine in early spring; it has a partiality for settling on the sandy roads which traverse the woods, and is very easy to capture.

Plusia chrysitis and P. Gamma.—Very abundant.

P. Iota.—Not uncommon.

Gonoptera Libatrix.—Common.

Amphipyra pyramidea and A. Tragopogonis.—Very common.

Catephia Alchymista.—Scarce.

C. Fraxini.—Used to occur amongst poplars in one locality. I have seen specimens taken there, but in 1872 the poplars were removed, and the insect has disappeared.

C. nupta.—Very abundant.

C. promissa.—Very scarce.

Euclidia Mi and E. Glyphica.—Common.

Halias prasinana.—Abundant.

I cannot speak with certainty with reference to the abundance or scarcity of those species of which I took but one specimen.

Many of our commonest English insects are absent from the above list: especially conspicuous by their absence are such as Caja, Lubricipeda, Menthastri, Auriflua, Antiqua, Neustria, &c. I can only say that I never met with them, but I should not like it to be inferred from this that they do not occur.

I imagine that collectors of Neuroptera and Diptera would have a great treat, especially in the pine forests. I was terribly annoyed by several individuals, which I referred to the latter order, some of them inflicting as much pain by their bites as a surgeon's lancet.

ARTHUR WM. PAUL.

Waltham Cross.

[I think the absence of the undermentioned butterflies, so familiar to English entomologists, may also be mentioned:—Galathea, Egeria, Semele, and Rubi; as well as the more local Artemis, C-Album, Epiphron, Lucina, and Betulæ.—*Edward Newman.*]

A Few Days in East Sussex. By W. H. Tugwell, Esq.

The early part of this June I spent six days entomologizing in East Sussex. The district is well wooded, and Lepidoptera appeared to abound; for although I was a perfect stranger in the locality, and had to find out the best spots, my captures were very satisfactory. My principal object was to find the rare and pretty Agrotera nemoralis, and I succeeded in taking a fine series of that species, as well as many other good things, as the following list will show.

Diurni.—In this family most of the early species were well represented; some, as Euphrosyne and Selene, were in profusion, three or four on a head of Ajuga reptans at a time. Athalia was not common; possibly too early for it. Tattered Rhamni were trying to make the most of their remaining days, and flew about briskly; I also found half-fed larvæ of this species. Cardamines were not numerous. Of the Lycænæ only two species put in an appearance, Agestis and Alexis; and of the skippers, Alveolus, Tages, and Sylvanus, were common.

Nocturni.—In this family my best captures, Statices and Trifolii, abounded in the meadows. Nola cristulalis and Strigula, not common. L. mesomella and Aureola; one larva of Quadra; whilst Rubricollis were flying in abundance over the taller oaks. C. Plantaginis gambolled in the sunshine; two Villica, flying in the hottest mid-day, when their bright colours showed off splendidly; and a male and female Bombyx Rubi; the sexes of this species appear at different times of the day,—the male may be often seen flying madly along during the afternoon, whilst the female flies at dusk.

The term Nocturni always appears, to my mind, a most inapplicable one, as the greater number are most decidedly day-flyers; and the grouping, too, brings strange fellowship, both as to habit and character. The old families, Sphingina and Bombyces, had a "raison d'être," that was far more natural in general appearance.

Geometræ.—The following species fell to my net:—E. adornaria, Dolobraria, Lunaria, Bidentata, Consortaria, Extersaria, Porata, Pendularia and Orbicularia, Sylvata, Pulveraria, five species of Eupithecia, M. hastata, and many of general distribution.

Drepanulæ.—P. Lacertula and Falcula, with C. spinula, represented this small family.

Noctuæ.—The season for Noctuæ had scarcely arrived, and the hot, dry, calm nights, were not propitious for sugar, so that my captures were not numerous. T. Batis, A. Aceris, C. Or, C. Duplaris, a very fine *var.* of G. Trilinea, and a few very common species, were all I observed.

Pyrales.—E. octomaculalis, A. nemoralis, Pandalis, Lancealis and Fuscalis, with several common species, complete my captures; and, for so short a stay, show that East Sussex is a good entomological locality.

W. H. Tugwell.

3, Lewisham Road, Greenwich, S.E.

Entomological Notes, Captures, &c.

Migration of Butterflies.—June 4th. This morning very large numbers of white butterflies—of two species, Pieris Brassicæ and P. Rapæ, the latter, however, greatly predominating—came into the North Lincolnshire marshes from the Yorkshire coast of the Humber (which, opposite this point, is from four and a half to five miles across). For an hour that I was near the sea embankment they were constantly passing inland, flying, too, against a rather stiff south-west breeze. Looking towards the centre of the river with a strong glass I could distinguish flights of them far away, flickering in the blaze of sunlight, against the gray background of water, like falling snow-flakes. I remember a very similar immigration of white butterflies into these marshes in the dry summer of 1870.—*John Cordeaux; Great Cotes, Ulceby, June* 6, 1874.

Pyrarga Egeria (Entom vii. 129).—There is a plantation a little distance from this town where, amongst many other things both rare and common, Pyrarga Egeria may be met with in some abundance, and, contrary to the experience of your correspondent Mr. Harwood, the insect seems of late to have increased in numbers in this particular locality. In fact, I have always regarded it as one of the common species, and have seldom taken the trouble to procure any. In some pasture-land adjoining the wood, Melitæa Artemis was at one time to be found in great profusion; but for the last two or

three years I have searched in vain for it: I am at a loss to account for its sudden disappearance. Latterly cows have been turned into the meadow. Is it possible that they have destroyed the pupæ?—*Joseph Anderson, jun.; Alresford, Hants.*

Variety of Pieris Rapæ (Entom. vii. 140).—The yellow variety of P. Rapæ is far from uncommon; I take it frequently here. I think myself it is a food variation, due to the larvæ having fed on turnips, as almost all the specimens I have were found flying over turnip-fields. I have, however, never taken it except in the autumn.—*W. Douglas Robinson-Douglas; Orchardton, Castle Douglas, June* 12, 1874.

Pieris Napi.—Early in May I took a pretty specimen of P. Napi, with under hind wings of a clear yellow, and having a pale orange costa.—*Id.*

Is Saturnia Carpini Double-brooded?—I see Mr. Oldfield (Entom. vii. 139) enquires as to the double-broodedness of Saturnia Carpini. Like Mr. Oldfield, from eggs deposited in April by this species, I have now young larvæ feeding *on whitethorn*, and now just changing their skin for the first time. The "verticillate" arrangement of the hairs is well seen in these young larvæ, which at this age closely resemble those of the various Eastern and North American species of Saturnia, Attacus, &c., in the same stage. As bearing on the possible double-broodedness of Carpini, I may state that from larvæ of Saturnia Pernyi, a Chinese species, hatched in May and spun up the beginning of August, I have had moths emerge both in September and also in the summer of the next year.—*W. A. Forbes;* 35, *South Castle Street, Edinburgh, June* 4, 1874.

[I have omitted Mr. Forbes' reference to Humphreys, confessedly obtained from Haworth, and Haworth confessedly from Fabricius, and his probably from some earlier authority. I imagine Mr. Oldfield's object, and *certainly mine*, was to get out of this copying groove, and to ascertain what was the result of recent observation,—the observation of living entomologists. I admit this would involve a complete revolution in Entomology, and I think the sooner it comes the better.—*Edward Newman.*]

Acronycta Alni at Doncaster.—In 1872 I had the pleasure to communicate to you the capture of a specimen of

V. Polychloros, an insect which had not been taken here for fifteen years previously. In 1873 I sent you the intelligence of taking a V. Antiopa by myself, and six more by others, not taken for twenty years previously. This year I have the pleasing intelligence to transmit to your subscribers of the capture here of two beautiful specimens of the alder-moth (Acronycta Alni), both in first-class condition. This rare fly has not been seen in Doncaster for nearly thirty years. I was out collecting the larvæ of W-Album, in company with J. Jackson, Wm. Cook, and Mr. Talbot of Wakefield, on the 30th of June, when one of the Alni was taken by Jackson, at rest, on the bole of a tree; the other was brushed out of the elm by Cook. This still shows the wonderful occurrence, that I should like some more experienced naturalist to clear up, how it is that insects reappear after an absence of a quarter of a century, and even longer periods.—*J. Potts;* 19, *Senior Terrace, Doncaster, June* 4, 1874.

Acronycta Alni in Yorkshire.—On the 31st of May I had the pleasure of taking a beautiful specimen of Acronycta Alni at rest.—*John Harrison;* 7, *Victoria Bridge, Barnsley, June* 17, 1874.

Acronycta Alni in Yorkshire.—I captured a very fine specimen of Acronycta Alni in Deffer Wood, near Nortonthorpe, June 8th, about 8.30 P.M.: it was resting on the trunk of an oak-tree, about four feet from the ground.—*F. Dearnley; Nortonthorpe Post-office, near Huddersfield, June* 23, 1874.

Acronycta Alni near Doncaster.—On Tuesday, June 2nd, I took a fine male specimen of Acronycta Alni, at rest, in Edlenton Wood, Doncaster; and the woodman, Mr. Atkinson, took a female for me on the 4th of June, at rest.—*W. Cooke;* 10, *Alma Place, Doncaster, June* 22, 1874.

Acronycta Alni and Asthena Blomeraria at Malvern.—I have great pleasure in recording the capture of two fine specimens of Acronycta Alni at sugar: the first, on the 28th of May, a female; the second, on the 9th of June, a male. In 1868 I took one specimen in the same wood, on the night of July 4th, and saw two others. I have also taken fine specimens of Asthena Blomeraria, by beating, this season, it being a scarce insect in this locality.—*W. Edwards;* 1, *Abbey Terrace, Great Malvern, June* 20, 1874.

Anticlea Sinuata near Dorking.—I captured a fine specimen of Anticlea Sinuata on the 19th of this month, near Ranmore Common, Dorking, flying by day.—*W. Thomas; St. Catharine's, Guildford, June* 22, 1874.

Buff Variety of Betularia, Bred.—I have taken a new buff and white variety of Betularia at Middleton. We have now had about five or six years breeding the black ones and mingled ones; I can say we have had thousands of them, in various stages, since first they turned up to the Middleton entomologists. I took the first black one and mingled one *in cop.*, and bred from them about seventy, all the black variety; and I believe these have been more common than the mingled ones since they turned up. Most of the members of the Middleton Entomological Society have captured either one or more, or had them brought to them by some friend; we have bred them over and over again, and they have turned out to be the common mingled ones, the dark mingled variety, and the black variety. We have been expecting a white one with either one or other of us, and now we have come pretty near with a buff and white mingled one, with not a black speck on it; and a black male with it. I have got about a hundred eggs from the female, which I intend trying to rear, and see what will come out of them. We have fed the larvæ chiefly on whitethorn; and if any entomologist is aware of a better food, I should be glad to hear what it is.—*T. Lomas; Rochdale Road, Middleton, near Manchester, June* 22, 1874.

Ophiodes Lunaris near Brighton.—While sugaring in company with Mr. Hards, near Brighton, on Saturday night, the 20th, I had the good fortune to take a very good specimen of Ophiodes Lunaris. I have shown it to Messrs. McArthur and Pratt on the setting-board, who both recognize it, although they have never seen one before. It is more strongly marked than the types in Newman's 'British Moths.' —*F. Trangmar; 20, Tidy Street, Brighton, June* 23, 1874.

Eupithecia Consignata.—On the 29th of April last I had the good fortune to capture on the wing a specimen of this rare Eupithecia in very beautiful condition, having apparently but recently emerged from the pupa. It was taken on Appledown, a portion of the famous Tichborne estate, about two miles distant from Alresford. Has it been discovered

before in Hampshire, or am I now adding a new locality for it?—*J. Anderson, jun.*

Dianthœcia Albimacula.—Two specimens, a male and a female, of this lovely species, were caught near Folkestone, on the 11th ult., by Mr. Purday, of that town. They are now in my possession, and are not yet dry. No others have been taken up to this date.—*E. G. Meek;* 56, *Brompton Road, S.W., June* 15, 1874.

Geometer Larvæ Eating Oak-galls.—A day or two ago I happened to find some galls (of which I enclose two specimens), of what I presume is Cynips lignicola (s. *Kollari*), in a young state of development, on some oaks near here. On arriving at home I deposited some of these temporarily in a glass jar containing a few Geometrine larvæ, of what species I cannot say. On looking again at them in the evening I was surprised to find these larvæ busy eating into the soft, succulent mass of the young gall, and apparently enjoying this strange repast. Whether this habit has been observed before I cannot say, but I have brought it before the notice of readers of the 'Entomologist' in the hope of acquiring further information on the subject.—*W. A. Forbes;* 35, *South Castle Street, Edinburgh, June* 4, 1874.

Congeries of Diptera.—Reading an article in the 'Entomologist' (Entom. vii. 14), on "Insect Congeries," reminded me of a remarkable instance which came under my observation at Whitmore Park about thirty years ago. In a newly-built wing of this house, in one room, I discovered an infinite number of small flies, of which I preserved some specimens, hoping to obtain a name. So numerous were they, that after fumigating the room with tobacco, which quickly brought down the insects from walls and ceiling, they lay so thickly on the floor that they were removed by shovelfulls at a time. I did not perceive them in any other room in the house, and to my knowledge have never seen the insect since. The specimens, I believe, are damaged by mites; but if you could name it, from those I enclose, I should be much obliged.—*F. J. Phillips; Whitmore Park, Coventry, June* 8, 1874.

[The little flies are Chlorops lineata. This habit of assembling in vast numbers has often been recorded; indeed, Mr. Walker has mentioned it in his 'Diptera

Britannica,' vol. ii. p. 228. The larvæ which produce this pretty insect are very injurious to corn, more particularly rye. The fly lays its egg on the young stems of the rye, and when it is hatched the larva gnaws its way into the interior, just below the first division or septum, which operation has the effect of immediately stopping the growth of the rye; so that the stem, instead of rising to a height of several feet, is dwarfed for ever at three or four inches, presenting a very singular appearance. Wheat and barley are subject also to this pest, or very similar ones of the genera Oscinis and Chlorops.—*Edward Newman.*]

A Railway Train Impeded by Locusts.—In Messrs. Kirby and Spence's 'Introduction to Entomology,' many remarkable records of the direct injuries of insects are to be found; many equally astonishing have come to my knowledge since the publication of the Introduction. The late Sir John Hearsey used to relate, with great gusto and humour, the dispersal of a troop of cavalry, when on march, under his command in India. Sir John had entrusted to the care of a mounted subaltern a swarm of honey-bees in a box-hive, when removing to a distant military station: the bee was an Indian species, Apis dorsata, the largest known, and also the most pugnacious. The man had the misfortune to drop the hive, which split open: out swarmed the infuriated host, which immediately vented their rage on the troopers, who quickly broke rank and galloped off in all directions, pursued by the maddened honey-bees, who stung man and horse indiscriminately. I write, however, on this occasion, to draw attention to a telegram that lately appeared in several of the London papers, dated—"Algiers, May 20th, 1874. A train arrived here to-day from Oran, six hours behind time: the rails were covered with a thick layer of grasshoppers." We cannot, I think, be at a loss to understand this, and fully comprehend the nature of the obstruction to the train: the wheels of the carriages, crushing a thick layer of locusts, would be much the same as if passing through a layer of fatty matter, which would consequently completely prevent the bite of the metals. This appears to me a circumstance worthy of being recorded in an entomological journal.—*Frederick Smith; 27, Richmond Crescent, Islington.*

A Note on Aphides.—At the beginning of the last week of

May there was not an Aphis to be seen on a mostly-shaded row of elder-shoots by a pond. At the end of this week there were many hundreds of thousands, and the usual attendants on clusters of Aphides were not wanting—such as the Aphidius watching them close by, the Aphelinus skipping on them, the ant running over them, the ladybird nibbling them, and various Muscidæ feeding on their honey. Few kinds of Aphis multiply so quickly as the elder Aphis, which is a remarkable instance of the shortness of time in which life is divided and individualised as organisms by means of the abundance of elder sap. The lime Aphis is one of the slowest in increasing: it was full grown in April this year, but was not more numerous on the same leaves at the end of a month. At the end of May little specks of honey may be seen on both sides of a lime-leaf, the surface of the leaf being often reversed by a slight wind. These specks are almost always few and irregular, notwithstanding the abundance of upper leaves, and quite resemble the specks, which are much more numerous, on the sycamore. A sycamore-leaf may be seen with one half quite covered with honey, of which substance there is no trace on the other half, the first half being just under a colony of Aphides on a leaf above; and at the end of May I saw just the same appearance on a lime-leaf, half of which was under another leaf, on whose under side there was an unusually great number of the lime Aphis. I have observed nearly all the species of Aphides that have been recorded as British, and in all cases they emit honey, and in every instance there has been no honey without them. —*Francis Walker.*

[The reader is referred to a paper on this subject, reprinted (Entom. vi. 463) from the 'Gardener's Chronicle.' Mr. Walker's note appears to have reference to this note, but he does not mention it.—*Edward Newman.*]

Is Heat the Chief Agent in Insect Development?—We naturally answer in the affirmative, and indeed reasonably so, since much or little experience all points to the same conclusion. A warm spring induces early developments, and a hot summer causes a second brood of species, which in ordinary seasons make but one appearance; to these trite assertions every reader of the 'Entomologist' can bear greater or less testimony. And although we sometimes read of the

successful—but often unsuccessful—plan of "forcing," thus causing a premature development, simply by a heightened temperature, yet the principle of warmth, in some few isolated cases, is open to argument. A short time since a correspondent told me of his taking a specimen of Macaria Alternata in the New Forest in May, together with several other species, which in ordinary seasons seldom occur till June, and this notwithstanding the winter-like weather we were experiencing at the time. Doubtless, the heat and almost summer-like atmosphere of a part of April would explain all this, and much more, if we only knew how to read "Dame Nature's" volume more correctly; but it seemed to me a strange coincidence, to be beating an Aureola from an oak whose shoots were crisp and black from the effects of frost. It may be argued that the early budding of the tree, as well as the development of the insects, are to be traced to the same cause, namely, heat; and the argument is undoubtedly correct, but the theory of heat is not so amply demonstrated in some cases: take, for instance, the development of the early spring Lepidoptera, as the Tæniocampa, Hirtaria, &c.; if the weather is cold and unfavourable at the time they naturally "come out," some of them are retarded in their development, and no heat of the subsequent summer awakens them, but they lie over until their "appointed time" the following spring, which seems an extraordinary thing, if heat alone causes development. The abundance of insects in summer, and their comparative rarity in winter, is an ample proof of the great part which heat plays in their development; but it is interesting in some cases to see how Nature, in her wonderful order and design, seems—to our finite understandings—to deviate from her unalterable laws, all for the benefit and well-being of her children.—*G. B. Corbin.*

Larvæ Required for Figuring.—As I am anxious to obtain correct drawings of the larvæ of Lepidoptera, from Nature, for publication, perhaps some of your readers possessing any rare species might be inclined to send me one or two for this purpose. If required, any larvæ shall be returned.—*Owen Wilson; Carmarthen.*

Change of Address.—T. N. Hoey, *from* 45, Athearn Road, Peckham, *to* 1, Cload Road, Philips Road, Peckham Rye, S.E.

THE ENTOMOLOGIST.

No. 132.] AUGUST, MDCCCLXXIV. [Price 6d.

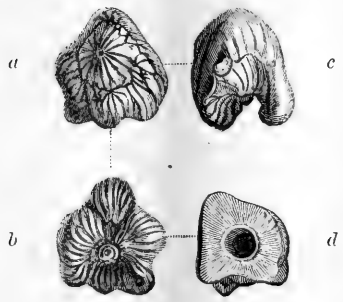
Variety of Arctia Lubricipeda (female).

Variety of Arctia Lubricipeda.—The antennæ are simple; the ground colour of all the wings is cream-colour; the fore wings are marked with black, the base, fringe, wing-rays and four blotches excepted; the markings of the hind wings are not so dark as those of the fore wings, and in them the base, wing-rays and fringe alone are cream-coloured; the head and thorax are the same colour as the ground of the wings, and the body is yellow, with six black spots down the middle and on each side.—*G. R. Dawson; June* 18, 1874.

[Mr. Dawson has most obligingly lent the specimen for the purpose of figuring in the 'Entomologist.' The late Mr. John Curtis published a beautiful figure of a very similar variety, under the name of Arctia radiata. A similar variety of Arctia Menthastri occasionally, but very rarely, occurs.—*Edward Newman.*]

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

Fig. 12.



CYNIPS CONIFICA.

a. Seen from above. *c*. Sideways.
b. From below. *d*. In section.

12. *Cynips conifica.*—This rare gall is found on the branches (several years old) of Quercus pedunculata and Q. pubescens. It is more or less regularly conical, and is much rounded off at the top, and measures ten or twelve millemetres in height and in thickness at the base. The latter has usually some short, stout processes, which are firmly attached to the branch. Its colour is brown, the surface being covered with short, white stellate hairs, intermixed with longitudinal furrows. These latter are somewhat raised, and by them the gall is more or less reticulated. The interior of the gall, when dried, appears to consist of a light brown, spongy reticulation, which closely surrounds the large, whitish yellow woody inner gall, which is situated at the base of the outer one. Hitherto I have received but a single specimen of the perfect insect. It emerged in March.—*G. L. Mayr.*

13. *Aphilothrix serotina.*—Of this delicate gall, which in outward appearance bears a resemblance to that of A. lucida, I have only seen two specimens, which were given to me by

Dr. Giraud. It is found either on the branches that are covered with earth or moss, or on the lowest part of the trunk of Quercus sessiliflora or of Q. pubescens. Like the two preceding galls it consists of an egg-shaped inner gall, which, with a covering as thin as paper, surrounds the large larva-cell, and is half a centimetre in length. The exterior surface, when dry, is covered with a thin, shining yellowish brown layer of bark. Out of this layer emanate a great number of radiating outstretched threads, half a centimetre in length, and covered with scattered hairs, about one millemetre in length. Dr. Giraud found this gall late in the autumn; and the perfect insect emerged in the September of the following year.—*G. L. Mayr.*

Fig. 13.

A. SEROTINA.
a. Two of the threads magnified.

Entomological Notes, Captures, &c.

Argynnis Niobe in Kent.—I beg to submit to your inspection a male specimen of a fritillary, caught in company with Aglaia on a very hilly inaccessible spot near here. Would you kindly let me know your opinion of it? I have sent a male and female, also, to Mr. Doubleday. They seem to me to be out before Aglaia, as Aglaia, specimens of which I have a hundred or more caught to-day, are bright and fresh. Are these varieties, or another species? Shall be happy to furnish the locality.—*W. Wigan; 8, Wincheap, Canterbury.*

[Mr. Doubleday allows me to publish the following information:—"I yesterday received from a Mr. Wigan a pair of Argynnis Niobe, which he says he caught on some hills near Wye, in Kent, flying with Aglaia, of which he took more than a hundred specimens. He states that he took three male Niobe on Monday, two of them being much wasted, and a female on Tuesday; this he sent to me, together with the best male; this was dead, but not stiff, and the female was still alive: they are not much more than half the size of my continental specimens, being very little larger

than Lathonia; the male is rather worn, but the female is a lovely specimen, with the black spots very large. I have no doubt whatever that these two specimens were captured in Kent; they could not have been obtained from the Continent alive in such dry weather as we have had lately." In a second letter Mr. Doubleday writes thus:—"The butterflies are most certainly Niobe, and quite distinct from Adippe and Aglaia. The moment I opened the box I saw what they were, without looking at the under sides.—*Henry Doubleday; Epping, July* 10, 1874." I have also examined the specimens so kindly sent to me by Mr. Wigan, and can see no reason whatever to doubt that this is a *bonâ fide* capture. I would ask Mr. Wigan's permission to have a pair drawn and engraved for the 'Entomologist.' I have written to Mr. Wigan soliciting farther information, and have also requested the loan of a pair to figure in the 'Entomologist;' that gentleman has replied very explicitly to my enquiries, and has kindly given me permission to figure the insects.—*Edward Newman.*]

Argynnis Niobe (second letter from Mr. Wigan).—Agreeably to your request I beg to inform you that the living specimens of Niobe, forwarded to yourself and Mr. Doubleday, were taken in a hilly district between Wye and Ashford, in Kent. I generally have a day every year about the end of June, and take as many Aglaia as I require. Going there a fortnight earlier last year, and paying a visit to my sugaring-grounds, where I take Leucophæa (which I do the end of May), I saw several of what I took to be worn-out specimens of Aglaia. Knowing that they are not done for till the end of July, or later, I, hap-hazard, took a specimen, and pinned it up; I never set it, but luckily kept it. Going to a pic-nic party a month later, near the same spot (Godmersham), there was Aglaia, in all the panoply of his silver armour, glittering in the sunlight, and apparently but just out. Feeling convinced that a few miles could not affect the time of their appearance by nearly a month, I carefully examined the specimen previously taken, on my return home. I think it was the longest day I ever experienced; and had it not been for discourtesy to the ladies, I must have returned by the next train. There it was, and is, and just sufficient to swear by, as being a large

fritillary of some kind. I told the circumstance to Parry, of this town, who showed me two fair specimens that he had taken at the same spot (I may add, there is no collusion between us, only we both possess the knowledge of this locality), and he told me he thought they were Niobe, or a new fritillary. They were thought, however, to be but a variety of Adippe. This year I was again too late to see the first of the males: my impression is they are out the end of May, and the females a month later, or less, perhaps. The female sent to Mr. Doubleday had just emerged when I took it, whilst the males I have are much worn, and Aglaia males bright and fresh, and no female Aglaia. The locality is a huge rent, caused at some remote time by a convulsion of Nature, with almost perpendicular sides, and covered with long grass, amidst which peep out the flowers of the wild heart's-ease, which grow here in great profusion. Upon these steepy slopes, where an alpen-stock would not be despised by any but an entomologist, fly Aglaia, but not Niobe. At the bottom of this trough, which is no more than a few yards wide, grows a kind of rush, and there, within a confined area, is to be found Niobe,—and very few, alas, indeed. Their flight is unmistakably different from Aglaia: they hover with an Athalia-like movement amongst the rushes, and fly with even greater rapidity than Aglaia; but, as a thistle-head will lure back a Paphia, so some herbage attraction (or otherwise) amongst the rushes brings them back to the same spot, and so they are captured. The female I took did not offer to fly; and my man, who collects for me and has taken another, tells me the same thing. In conclusion, let me add that the entomologist, when taking his yearly outing, would do well to work the neighbourhood of Wye and Ashford; and if he does not succeed in finding the haunt of Niobe, he will not for want of sport leave it "all tears;" and I can answer (with favourable weather) that he will take insects commonly here that occur elsewhere as rarities.—*W. Wigan; Canterbury.*

Argynnis Niobe a British Insect.—Yesterday morning, just before I was leaving town, I received from Mr. G. Parry, of Canterbury, a living specimen of this butterfly taken the day before, and a request that I should come down on the following Friday, when he would take me to the place of its capture, that I might see and take it myself, and thus confirm

the nativity of the species. It was most unfortunate that I had made arrangements to visit friends in the Midland Counties, and was due at Dr. Baly's, at Warwick, at 4 P.M. I had just time to show the species alive to Mr. Cooke, and, on my arrival here, to Dr. Baly, who saw it quite fresh, it having just died. The specimen has evidently been taken on the wing, and is in fair order, but very different in condition to a bred specimen. Mr. P. informs me it flies in company with Aglaia on the slopes of one of the highest hills in Kent, and cannot be distinguished from that species till captured.—*Samuel Stevens; Warwick, July* 10, 1874.

[Although Argynnis Niobe has been previously recorded as a British insect, by the Rev. W. Hambrough, at p. 351 of the sixth volume of the 'Entomologist,' on the authority of a specimen taken in the New Forest, by Mr. Gerrard, in 1868, and again at p. 30 of my 'Illustrated Natural History of British Butterflies,' these additional captures are particularly interesting.—*Edward Newman.*]

Vanessa Polychloros at Westbury-on-Trym.—I write to inform you that I captured here, on the 31st of May, a specimen of Vanessa Polychloros (the great tortoiseshell): it was rubbed and slightly chipped.—*Edward R. Pease; Cote Bank, Westbury-on-Trym, Bristol, June* 11, 1874.

Limenitis Sibylla at Hendon.—I have just taken a specimen of Limenitis Sibylla (in fair condition): it was flying along a hedge by the road-side, about half a mile from this place.—*R. South; Goldbeater's Farm, Mill Hill, Hendon, July* 14, 1874.

Thecla W-Album on the Flowers of the Lime Tree.—My pupils and myself took about thirty specimens yesterday of Thecla W-Album on the flowers of the lime tree. I cannot say why they should seek this tree particularly, as there are only two in my grounds, and I do not know of any others near. They settled on the flowers, and were at first very easily caught.—[*Rev.*] *John W. Mills; St. Lawrence Rectory, Maldon, Essex, July* 15, 1874.

Thecla Pruni in Buckinghamshire.—On the 4th July, being at Linford Wood, taking Trycheris mediana for a correspondent, I captured several specimens of Thecla Pruni, on flowers of the privet, mostly females; and as there is no record of it being taken in Bucks, perhaps you may

think it worth notice in the 'Entomologist.'—*W. Thompson:* 183, *Stantonbury, Stoney Stratford, Bucks, July* 13, 1874.

Leucophasia Sinapis Ovipositing.—On the 13th of June I was in the woods at Grange, North Lancashire, when I observed several wood-whites flitting about and settling on various plants close to me. It then occurred to me I had seen an article in one of our magazines that wood-whites had never been observed to settle, always being seen on the wing. I have seen scores in my time at rest. I stooped down to look whether they were males or females on the ox-eye daisy-flowers: one I watched more carefully than the others, as I could see it was very anxious to find a plant to lay eggs upon; I stood still and watched it within three feet of me, and it was careful among the rough herbage to single out the trefoil to deposit its eggs upon; I noted some of the sprigs, so that I could gather them to look for the eggs, and there was only one egg deposited on each sprig; the shape of the egg is very peculiar, just the shape of a conical shot. I also found young larvæ, about three-eighths of an inch long, on the same plant. It seems as if Loti ought to be the name, instead of Sinapis.—*J. B. Hodgkinson;* 15, *Spring Bank, Preston.*

Is Acidalia rubricata a Single-[*brooded*] *Species?*—I have twice endeavoured to rear this insect from the egg. The first time the only caterpillar that survived the winter died at the commencement of June. This year two caterpillars survived the winter, and one moth has appeared this morning. Now, caterpillars of the August brood ought, by right, to have produced the May brood. I have not yet succeeded in obtaining eggs from the May brood.—[*Rev.*] *A. H. Wratislaw; School Hall, Bury St. Edmunds, July* 2, 1874.

Description of the Larva of Eupisteria heparata.—On the 2nd of July last I received a few larvæ of this species from Mr. A. H. Jones, of Eltham, and on the 5th described them as follows:—Slender, length about five-eighths of an inch; head the same width as the 2nd segment, globular, and slightly notched on the crown; body cylindrical, and of nearly uniform width throughout; each segment is plump in the middle, which makes the divisions distinct; skin clothed with a few short scattered hairs. Ground colour bright green; head glaucous-green, with a large black ocellus on the upper

part of each lobe; the mandibles brown. A broad, velvety black band extends throughout the dorsal area, and is intersected by the pale, greenish yellow indistinct dorsal line; it is also edged on each side with a clear yellow stripe, which is again divided into black squares by clear yellow segmental divisions; these black squares vary in intensity in different specimens, in some only occupying the anterior of the segment, the other half being of the ground colour; all have a mark of the ground colour, varying in size, on the posterior part of the segments. The sides are minutely dotted with gray, and there is a very indistinct yellowish line along the spiracular region. Ventral surface, legs and claspers green; of a darker shade than the ground of the dorsal surface. When young the black dorsal band, so conspicuous in the adult larva, is absent. Feeds on alder; and shortly before spinning up the colour entirely changes, becoming dark green with purple tinge, and the segmental divisions purple. My larvæ spun loose cocoons amongst the leaves, &c.; but in a state of nature they probably form them amongst moss, &c., on the trunks and about the roots of alder.—*Geo. T. Porritt; Huddersfield, June* 26, 1874.

Description of Varieties of the Larva of Notodonta Carmelita.—Var. 1.—Ground colour white, with a greenish tinge on the back, becoming more perceptible towards the anterior segments. Down the centre of the back is a blue line, extending to the last segment, distinct on the middle of the segments, and becoming fainter, or sometimes entirely disappearing in the inter-segmental divisions. On each side of this line there are scattered a very few, exceedingly small white tubercles, each bearing a hair. On each side of the central line is another of a much lighter blue, and beneath this the ground colour changes to bluish green, or sometimes yellowish green. The spiracles are situated a little below this line, and their colour is black, and each is surrounded by a whitish line, and again a red line around this, the red being more marked round the spiracles situated on the posterior segments. Between the spiracles is a yellow line, which is continued uninterruptedly over the non-spiracular segments. Beneath the spiracles the tubercles are more numerous, and in those segments bearing neither legs nor claspers a belt of tubercles is continued under the belly. The legs and claspers

are red, with a black semilunar mark at the junction of the claspers with the body. On the top of the 12th segment there are two warts, one on each side of the blue line before mentioned, which, as it passes between them, is marked by a dilatation. These warts are red at the upper part, and emit hairs. The head is either bluish green or light yellowish green. The ocelli black. A short black line extends horizontally on each side of the mandibles, which are red, bounded with black. The head emits hairs. *Var.* 2.—Ground colour light greenish yellow, becoming more decidedly green underneath. Otherwise similar. *Var.* 3.—Head a light pinkish brown, emitting not nearly so many hairs as ordinarily. Body, above the spiracles, creamy white between the segments, and with a saddle of pink across the middle of each segment. Warts, legs, and claspers, not so red as in the ordinary varieties. Line down the back and the lines on each side, instead of blue, are pink. Spiracles and inter-spiracular line the same as usual. Beneath the spiracles the colour is very light yellowish brown, darker between the claspers. *Var.* 1 is the common condition of the larva, and *var.* 2 is also very generally found; but *var.* 3 is, I believe, rather scarce. I have only seen it once, when I beat it, then quite small, from oak, 5th September, 1873. I have bred all the moths this year, and there is no perceptible difference between them.—*E. B. Poulton; Victoria Villa, Reading, July* 8, 1874.

Dianthœcia Albimacula and Acronycta Leporina.—I had the pleasure of taking a very good specimen of Dianthœcia albimacula, on Tuesday, June 23rd, as it was flying over a small bed of Silene nutans, on the Lower Road, Folkestone. Two collectors were present, and one of them—himself the captor of two specimens of this insect, at Folkestone—pointed out the value of my capture. I also caught a fine specimen of Leporina at sugar, in a wood about three miles from Folkestone, about a week after the capture of Albimacula.—*Id.*

Larvæ of Dianthœcia Albimacula.—I have taken during the last week several larvæ of the above species, feeding on Silene nutans: this plant is not so local as it is supposed to be: I have found it in many parts of Kent; also in the Isle of Wight.—*E. G. Meek;* 56, *Brompton Road, S.W.*

Botys Terrealis Bred.—Last September I found half a dozen larvæ of Terrealis on one plant of golden rod: their presence is easily detected, as often all is eaten away but the stalk; they form a light silken web, as a covering from exposure. I have been lucky enough to rear four specimens, quite unexpectedly, as the year before I got two dozen larvæ and did not rear one, although I nursed them well, and attended to all the sanitary arrangements I could think of: they often live through the winter. Those that I have bred were evidently of the "fittest-to-live" class, because they were put into a box, either to live or die, and not cared for in any way; indeed, they were forgotten. I will try to forget more for next year.—*J. B. Hodgkinson;* 15, *Spring Bank, Preston, July* 3, 1874.

Acronycta Alni near Sheffield.—I had the pleasure of taking a fine male Acronycta Alni, at rest on the trunk of a tree, when out for a walk, in the neighbourhood of Sheffield, on the 14th of June.—*Wm. Sheldon; Upper Saint Philip's Road, Sheffield.*

Halonota grandævana at Hartlepool.—I have this year taken several specimens of Halonota grandævana on the ballast hill here, thus confirming Hartlepool as a locality for this species.—*J. Gardner;* 8, *Friar Terrace, Hartlepool, July* 18, 1874.

Crymodes exulis again taken.—I sugared for sixteen nights lately in the locality where I had before taken this species, but only took one specimen. It came to the sugar near midnight on the 7th July.—*Nicholas Cooke; Gorsey Hey, Liscard, near Birkenhead, July* 20, 1874.

Chesias obliquaria and Anarta Myrtilli.—In the middle of August, last year, I had six pupæ of C. obliquaria, which I placed in my breeding-cage. Although this is a May insect I bred one as early as April 1st, and two others made their appearance between that time and May 7th, but at what precise dates I cannot say, as I was away from home. I thought I had done with the insect, but to my surprise to-day (June 18th) another specimen appeared. June and July are the months for A. Myrtilli. Agreeably to this I took the insect at Tillgate, July 13th, 1872. On the 17th of July, last year, the day was very dull, on which we went to the same place, and there was very little to be found.

I believe, however, that my friend took a specimen of Myrtilli; but at any rate we took three nearly full-grown larvæ of that species, for which I find September and October are the reputed months; and from these a moth emerged in my breeding-cage on June 8th.—[*Rev.*] *E. H. Egles; Enfield, June* 18, 1874.

Platypterix Sicula near Bristol.—I have to record the capture by myself, in Leigh Woods, on the 6th and 10th of last month, of three examples of this rare hooktip,—a male and two females; and on the 17th a male, by Mr. A. E. Hudd; this latter apparently just emerged. Another fine male was taken on the 27th by a visitor to Clifton. I believe the last recorded capture of Sicula was in 1859, when seventeen specimens were taken. Altogether, to the present time, some twenty-five would be in existence in different collections. Perhaps it would not be out of place were I to mention a little adventure, in connection with my above-mentioned capture, which befel me in one of my excursions to these celebrated woods, and which at one time assumed rather a serious aspect. I was forcing my way through some dense undergrowth, when I had the misfortune to walk into one of the many excavations that occur in these woods, and of which I had no previous knowledge. It seems now perfectly marvellous how I could have fallen such a depth (upwards of thirty feet) without sustaining some injury beyond a few trifling scratches, and of course a good shaking; but such was fortunately the case; and the fact of having fallen on my feet, and the bottom of the hole being composed of soft mire, would partly account for my escaping with so little bodily hurt. Had I broken or sprained a limb, in all probability I could not have made any subsequent attempt to extricate myself, and the chance of being heard would have been slight indeed, as I was in a part of the wood seldom visited by the keepers. For nearly two hours was I in this predicament, but at last managed to scramble out with the assistance of a half-rotten pole, which providentially had been thrown into the hole (as I afterwards heard) by a keeper, some seven years previously. My feelings of thankfulness can well be imagined, for without this aid I certainly could not have got out, unless help had reached me from another quarter. This hole was some four feet in circumference at

the top, being hollowed out considerably in the centre, and narrowing again at the bottom. I have frequently visited the spot since the occurrence, but cannot look into the hole without a shudder, and with feelings of thankfulness for such a providential escape. My visit in search of Sicula had well-nigh cost me my life.—*William H. Grigg; Bristol, July* 22, 1874.

Apamea Unanimis making up in Decayed Willow-wood. —Will you oblige me by naming the enclosed insects? I found the pupæ while seeking Coleoptera in some willows, in April. I enclose a pupa-case that one of them came out of. I have your 'British Moths,' but I can find nothing in it that corresponds with them.—*H. Sims; Howard Street, Wakefield, May* 27, 1874.

[The moth is Apamea Unanimis.—*Edward Newman.*]

Nola albulalis, &c., in North Kent.—On Monday morning last, the 13th July, I left home for five days' collecting, in company with the Rev. T. W. Daltry, of Madeley, in North Kent. A day or two before, Mr. Daltry, who had been there the week previous, had written me he had found out the locality for Nola albulalis, and to collect this species was my principal inducement for going. Monday evening we went to the marshes, and found Acidalia emutaria not uncommon; the following morning A. rusticata was collected in great abundance from two elm hedges; the afternoon and evening we spent in the Albulalis locality, and took the species very freely; Wednesday and Thursday evenings we had equal success, the species flying in abundance: indeed, at one time, standing in one spot, I took them as they flew past as fast as I could box them. Friday evening we went again, but were astonished to find that not a single specimen was to be seen: we could only account for it by the fact that the atmosphere had become colder, and the ground damp; do what we would neither of us could find one. Here we met Mr. Packman, of Dartford, to whose kindness we are indebted for valuable information about several species. Albulalis is easily distinguished from the grass, low underwood, &c., in the daytime, and for a short time, just at dusk, flies very freely: it flies slowly, and not far from the ground, its pale colour rendering it so conspicuous that, although so small, the marvel to me is that it is has remained a rarity for so long.

Apatura Iris was not uncommon about the oaks in one place, and Pterophorus rhododactylus occurred about rose. Amongst the other species noticed or taken were—Vanessa Polychloros, Arge Galathea (very abundant), Lycæna Corydon, Zeuzera Æsculi, Nola cuculatella, Lithosia mesomella, Angerona prunaria, Pseudopterpna cytisaria, Iodis vernaria, Hemithea thymiaria, Acidalia interjectaria, A. incanaria, A. immutata, A. emarginata, Timandra amataria, Strenia clathrata, Scotosia vetulata, Cidaria picata, Erastria fuscula, Rivula sericealis (abundant), Botys hyalinalis and fuscalis, Ebulea crocealis (abundant about fleabane), Scoparia cembralis, Crambus pinetellus, C. perlellus, C. Warringtonellus, Ilythyia carnella, Homœosoma eluviella, Rhodophæa consociella and tumidella, &c.—*Geo. T. Porritt; Huddersfield, July* 20, 1874.

Hairy Larvæ on the Black Currant.—During the past fortnight I have found several small batches of eggs laid on the under side of leaves of black-currant trees in my garden. Some of these have hatched, and the young larvæ are very hairy, and look like Menthastri. I should like your opinion as to whether they can be that common species, as I thought it only fed on low plants.—*H. Wittich; 6, Lansdown Cottages, Dalston, June* 22, 1874.

[Without seeing them I cannot venture an opinion.—*Edward Newman.*]

Field Naturalists' Society. Cnethocampa pityocampa and Anthrocera Loniceræ.—We have formed a Field Naturalists' Society in York, to replace in some measure the Entomological Society, which some few years ago we had in York. Will the reports of our meetings be of any service to either the 'Zoologist' or 'Entomologist?' I have had some larvæ of Pityocampa sent me by Mr. Batchelor. Can you tell me anything about them, and whether I may exhibit them as British? It seems strange to me that they have not been found before. Did you make anything out about the Loniceræ I sent you last summer?—*Wm. Prest; 13, Holgate Road, York, March* 23, 1874.

[1. If sent regularly I should be glad of reports of the meetings of local societies, but I have never known them continued beyond the second or third meeting. 2. I have no knowledge of Cnethocampa beyond what I have published.

3. The specimens of Zygæna so kindly sent do not agree with Loniceræ in any of the characters noticed by Mr. Doubleday.—*Edward Newman.*]

Names of Moths.—Would you kindly oblige me by naming these three little insects? One I take to be Erastria venustula, discovered by Mr. Doubleday in Epping; the bright pink faded very much after death. The other is, I think, Erastria fuscula. Both are common here, especially the first. I could have caught a hundred off the heath one evening (Tuesday, June 2nd). The other little black longhorn I cannot find a trace of in my books: they were flying over water in the forest; I took six or seven one evening.—*David M. G. Price; West Street, Horsham, July* 21, 1874.

[Only one wing, that of Erastria fuscula, could be recognized. The rest of the insects were literally ground to powder. Please pack more carefully another time. The discovery of Erastria venustula at Horsham would be very interesting.—*Edward Newman.*]

The Dor-beetle (Entom. vii. 132).—With regard to my notes, and the editorial remarks thereon, I fear I am unable to offer any very satisfactory materials for judgment. First, respecting the specific name of the beetle I am not sure, and I foolishly did not secure any for identification, but on the first opportunity, after reading Mr. Newman's remarks, I made a journey to the heaths, expecting to find *some* specimens, at least, of the beetles I had seen so commonly on my previous visit. I was, however, doomed to a most grievous disappointment, for not a specimen was visible upon the grassy plot, where, but a comparatively short time ago, hundreds were lying dead and disemboweled. I observed a number of what I suppose were mouse-holes about in the grass, but whether they explain anything with regard to the —to me—mysterious disappearance of the beetles I am not prepared to say, neither can I assign any plausible reason for the mortality which had previously taken place amongst the Coleoptera. Many of the tunnels formed by the beetles were still visible, and as far as a pocket-knife was available I used it in digging into some of them, in the hope of finding one of the beetles. By this examination I obtained one dead specimen (which I send), but I am by no means certain it is the same species I saw working, for, if I mistake not, its

thorax was quite rounded and smooth: memory, however, as we all know, is very treacherous, and specific differences can never reasonably be deduced therefrom. As far as I observed, the beetles confined themselves to the collecting of the pellets of rabbits'-dung, but this single observation cannot, I think, establish the fact of their invariably doing so. There seemed to be no other suitable material at hand for the purpose, and possibly what I saw was but an adaptation of a means to an end, since, as far as I could judge, the locality, and nature of the soil, &c., were peculiarly suited to the beetles' requirements. The depth of the tunnels excavated by these beetles were of comparatively considerable magnitude, as I could probe many of them with a pliant stem of the common braken some ten or twelve inches, and, indeed, with the aid of my knife I enlarged some of them to an equal or even greater depth without finding traces of either beetles or pellets.—*G. B. Corbin.*

[The beetle found by Mr. Corbin is Typhœus vulgaris.—*Edward Newman.*]

The supposed Potato-bug.—Will you kindly inform me what the enclosed creatures are? They were sent to me yesterday from Wimborne, where I am told they are doing some amount of damage to the potato crop, by destroying the haulm. I suppose it is the grub of some beetle, and I believe I have seen similar creatures not unfrequently before, yet I am unable to name it. Of course, everything in any form upon the potato cannot (in the eyes of the grower) be less than the "Colorado potato-bug."—*G. B. Corbin.*

[The chrysalides of Coccinella 7-punctata. I am quite at a loss to conceive what damage they can do, since in this state they do not feed at all: in the larval and perfect state their food is Aphides, or plant-lice.—*Edward Newman.*]

G. Harvey.—The beetles are Coccinella septem-punctata: they feed on Aphides. They have no connection with the potato-bug.—*Edward Newman.*

W. Macmillan.—The larva is that of Biston hirtaria. The ichneumon, Macrogaster alvearius, so-called from the resemblance of its mass of little cocoons to a honeycomb.—*Id.*

Colonizing Glow-worms.—Can you tell me how we can establish a colony of glow-worms at Woodford? There are

plenty of them here, and we could take them home if we knew on what they feed. Do the females lay their eggs on any plant, or in the ground; and what is that plant? They appear very feeble if kept for a night in confinement, but recover and shine when placed out on the dewy grass.—*A. F. F.; Sea View, Isle of Wight.*

[I have often tried to establish a colony of glow-worms, but have always failed: the light becomes more feeble, night after night, until it dwindles to a spark and disappears. The eggs are attached by means of a kind of liquid glue to a variety of substances, as moss, grass, dead wood, or even earth, apparently without any especial reference to the food of the larva, except that they are generally found in places where its food occurs, as damp ditches and shaded hedge-banks: that food consists of the eggs and young individuals of different species of land-snails; Zonites cellarius and Z. alliarius are especial favourites. The larvæ attain their full size in April, and then turn into quiescent pupæ, but still retain great muscular power, as evinced by their writhings and twistings when teazed or otherwise annoyed: the pupa can also move its head, antennæ, and legs; the female pupa, as in the perfect insect, exhibits no trace of wings or elytra; the male pupa, on the contrary, has the usual representatives of these organs. The universally received hypothesis that the light of the female glow-worm—like a chignon, a pannier, or a crinoline, among ourselves—is a lure to attract the male, requires investigation and consideration. I cannot disprove it; but the presence of this luminosity in the egg, larva and pupa, and also abundantly in the males of some allied species, seems to point to the desirability of some other explanation.—*Edward Newman.*]

Bees Fertilizing Flowers.—I shall be very grateful to any reader who will procure and send me the bees which frequent the bloom of the scarlet-runner or the red clover. It is well known to those who have studied the subject that these plants cannot fertilize themselves, but are dependent on insects for the performance of that office. Our countrymen resident in Central America, where the scarlet-runner would be a most acceptable vegetable, cannot cultivate it to any good purpose, because the natural fertilizer is not indigenous, and has not been introduced. In like manner the

red clover, so largely grown in New Zealand, is raised from English and continental seed, and for the same reason. An annual saving of many hundred thousand pounds might be effected, if, together with the seed, we could export the insect, whose office in the economy of Nature is to render the respective plants productive. During the past and present months I have captured three hundred and sixty-one bees, noting in every instance the flowers they were fertilizing, with a view to ascertain their utility as fertilizers in a commercial point of view.—*Edward Newman.*

Œnistis Quadra.—I took a fine specimen of Œnistis Quadra, at lime blossom, in my garden, on the evening of the 10th July. The insect was a male, and appeared to have been out only a few hours.—*A. Harold Ruston; Aylesby House, Chatteris, Cambridge, July* 24, 1874.

Food-plant of Erastria fuscula.—The food-plant of E. fuscula, or how to obtain the larvæ, is no longer a mystery to me. Having taken lodgings in the vicinity where the imago was plentiful, I made up my mind, if it was possible, to obtain the larvæ: accordingly in the first week in September last I set to work, and the first night searched the bramble (the food-plant named by M. Guenée) for a long time; afterwards tried ferns, and then the heath: the first two evenings unsuccessfully; the third I tried sweeping, and to my delight obtained about a dozen in the first hour. The question then became, what was the food-plant? and on careful search found it was grass (Molinia cærulea). After that I collected them without any trouble, feeding by night, about half-way up the blade of grass. I bred a nice series of the imago this spring, and tried to obtain eggs, but have failed, although I placed several pairs on the food-plant I had growing in a large pot.—*G. C. Bignell; 6, Clarence Place, Stonehouse, Plymouth.*

Names of Insects.—I shall be much obliged if you will be so kind as to name the insects I forward with this. No. 1, one of the Ichneumonidæ, I bred from a mass of long, fusiform, brownish cocoons, found at the base of willow stumps; the little bee, No. 4, I have obtained very commonly by sweeping in grassy places in May and June, whilst the Dipterous insect, No. 5, is the only one of the kind I have seen; from its long, sabre-shaped ovipositor it would appear

to be parasitical on other insects. Is this the case?—*W. A. Forbes;* 35, *South Castle Street, Edinburgh, June* 17, 1874.

[The insects are returned named, with the exception of the little black ichneumon with exuded ovipositor, which I must decline; I have never professed to name ichneumons. The little bees, of the genus Halictus, positively swarm on all garden-flowers at this time of year. The pretty fly, No. 5, is a gall-maker, not a parasite; the long ovipositor is for the purpose of penetrating the rind of the twig, in which it deposits its eggs: from this peculiar structure the insect has been named *Stylata.—Edward Newman.*]

Acronycta Alni in the New Forest.—On returning yesterday with a friend from a New Forest expedition, between Brokenhurst and Lyndhurst, our attention was suddenly attracted by the brilliant yellow and rich dark blue colours of this splendid and unmistakable caterpillar, at rest, in a slightly curved position, on some old palings.—*W. Borrer, jun.; Cowfold, Horsham, Sussex, July* 25, 1874.

Extracts from the Proceedings of the Entomological Society of London, May 4th and June 1st, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Supposed Albino Solenobia.—Mr. W. C. Boyd exhibited specimens of Solenobia inconspicuella, taken in St. Leonard's Forest, and amongst them a specimen, taken at the same time, of a remarkably pale colour, which might possibly be an albino variety, but had a very different appearance from the ordinary form.

Brachycentrus subnubilus.—Mr. Boyd also exhibited some leaves of the common comfrey (Symphytum officinale), gathered at Cheshunt, the under sides of which were found to be completely covered with specimens of Brachycentrus subnubilus. There appeared to be some hundreds of specimens closely packed together, and they were all dead, or in a moribund state, when found. All were said to be males, but on close examination a single female specimen was discovered amongst them. No explanation could be given as to the object of their congregating together. Mr. Stainton remarked that there were many such instances of a habit of congregating amongst insects, which were equally unaccountable, and as an instance he mentioned a fact known to all breeders

of Micro-Lepidoptera respecting the pupation of the greater number of the Nepticulæ, the larvæ of which live solitary as leaf-miners; but if a number of leaves, containing larvæ, are collected and placed together in a box, it is found that the cocoons are constructed gregariously between certain leaves, without any apparent reason for the preference.

Timber-boring Beetle.—Mr. Charles O. Waterhouse read the following note by Dr. Lamprey, Surgeon-Major of the 67th Regiment, on the habits of a boring-beetle found in British Burmah. A specimen of the insect was exhibited, and also two portions of stem which had been operated upon. The insect was one of the Bostrichidæ, belonging to the genus Sinoxylon. "On examining the plants in my garden one afternoon, I was struck with what appeared to be an injury done to one of the trees, the name of which I do not know,—this being the winter season, no blossom apparent, and nearly all the plants new to me. The branches of this particular tree are straight, grow upright, and are about half an inch to an inch in their diameter. One of the tallest of these branches, which reached to a height of about eight feet, was apparently broken and lying on the other branches, as if it was cut or broken off in a mischievous way. I was on the point of questioning the gardener about it, when I observed the leaves of another branch quite withered, and, on taking hold of it to bend it towards me, it snapped in a curiously brittle manner. Looking at where it was broken, I found the stem to be completely severed with a clean division, and that it was only kept together by the thin outer layer of the bark. Examining another branch, I found it snapped in an equally mysterious way, but in doing so a small black insect fell out of the broken part; it was too rapid in its movements, and I lost it. On further examination of the broken parts, and putting them into position again, I found a small circular opening, about the size of the hole in the gall-nut, and concluded that the insect I saw had eaten its way into the stem, and by devouring the wood completely round, and not along its long axis, accounted for the fracture in this particular locality. Since then I have been on the watch to discover the insect, and have succeeded in securing two specimens; one was found in the stem on breaking it across in the position of one of the external apertures: this specimen is somewhat injured by the loss of one of its elytra. The other

specimen I found had buried itself so far into the stem as just to leave its posterior part exposed. They are both beetles, about a quarter of an inch in length, black in colour, and have a large head of peculiar shape, well adapted, no doubt, to contain powerful muscles and mandibles for tearing the tough woody fibre of the stem of the plant; but I leave their description to the entomologists. The office these creatures are no doubt intended to fulfil in Nature's economy is to assist in keeping the tropical vegetation in check. They burrow into the stem of the tree, are rewarded by the sap and nourishment it affords, and are liberated, after performing this task, by a gust of wind snapping the undermined and weakened stem across. They are not found in other trees or shrubs than the one alluded to. The beetle turns on his side while boring, his back being towards the bark: in this manner his form suits the circumference of the stem."

White Ant bred at Kew.—Mr. M'Lachlan exhibited specimens of a white ant (Calotermes sp.), recently bred at Kew from a sample of the wood of the tree (Trachylobium Hornmannianum) that produces the gum copal of Zanzibar.

Deiopeia pulchella in Cornwall.—Mr. Stainton read a letter he had received from the Rev. P. H. Newnham, of Stonehouse, Devon, stating that he had taken two living specimens of Deiopeia pulchella, on the opposite side of the river Tamar, in Cornwall. Mr. Stainton remarked on the unusual circumstance of the insect having been captured at such an early season as the month of May.

A Living Mantid exhibited.—Mr. Charles O. Waterhouse sent for exhibition a living specimen of a Mantid (Empusa pauperata), in the larva or pupa state, brought from Hyères by the Rev. Mr. Sandes, of Wandsworth. The captor stated that he had supplied it with flies, &c., in the hope of ascertaining the mode in which it seized them, but that he could not induce it to eat anything while he was looking on. Mr. Stainton suggested that if he had put a living spider in the cage it would probably have seized it immediately.

The Coffee-borer of Natal.—The Secretary read the following note, which he had received from Mr. William D. Gooch, of Spring Vale, Little Umhlanga, Natal, respecting the habits of the Longicorn "coffee-borer of Natal":—"The egg, as far as we can determine, is laid about the level of the soil, about the middle of December, at a time when the trees look most

healthy, are making most wood, and the circulation of the sap is most free, it being also during the damp part of the year. I have, however, despite considerable investigation, been unable to get specimens of the egg, and so watch the development of the larva from the earliest stages. Specimens of the larva have already been laid before the members of your Society, but I forward by this post also some specimens. In only three cases, about January or December, have I met with any insect in the bark, between the level of the ground and the roots, at all corresponding to the larger insect found in the wood. On examining those trees with larvæ in, with hardly any exception, we discover the bark eaten away, or rather, I should say, wanting, about the level of the ground; from this place to the entrance-hole of the borer in the forks of the roots there is always to be observed a more or less irregular channel or road cut in the bark leading from one to the other, and in this channel I discovered two of the three small specimens of larvæ mentioned above. The entrance-hole of the larva is very irregularly placed; sometimes it begins as an excavation along one of the roots at a fork in the rootlets; sometimes it enters immediately under the first root, hardly below the ground. I have not noticed the entrance of the larva above ground, except in two instances, when there was a hole below the lowest primary in one case and the second primary in the other. I did not, however, satisfactorily determine that these were the same insect, or, even if so, they may be considered as accidental cases. The excavation of the wood of the tree by the larvæ need not be entered into, as every one must be well aware of their powerful mandibles and their unlimited appetites. How long the insect remains in the larva form I have not yet been able to judge; but in consequence of finding always two and sometimes three distinct sizes in the insects taken out of a hundred trees, I imagine not less than two years, and possibly so long as three. The first transformation at present I have only observed in October; but I am half inclined to think there is a double brood, and another transformation about May: as I was not in the colony at that time last year, having given my attention to the question since July last, I am looking forward next month to deciding this point, as unluckily we have many diseased trees to operate on. I enclosed with the larva formerly sent to you a specimen of the pupa; it was first

discovered about the beginning of October, and was found till the middle of December. The first perfect insects were found in the beginning of December and the last week in November. The imago, from the name, I imagine to be Anthorea leuconotus, a longicorn, with the elytra covered with very fine down, almost a bloom, and grayish colour, the bases of the elytra being of a reddish chocolate, with a purplish shot on it when newly emerged. The insect, I think, lies torpid after its complete transformation till some 'drying day' comes, when it bores its way out; but what happens to it afterwards I have never been able to discover: only three specimens were found on the whole estate, although I offered sixpence each for them, and we were splitting trees with two and three perfect insects in them each. When I speak of a 'drying day,' I mean one of the 'hot winds' from the north-west, which occur in our spring here, taking the thermometer up to 100° in the shade, and considerably affecting insect-life. I noticed especially that the morning after one of these hot winds, on splitting some of the trees, the insects looked so lively that we left off splitting in haste, and gathering the trees together in large heaps burnt them straight off. I said before that only three insects were found at large on the whole plantation by our people; of these two were *in copulâ* on a primary branch of a coffee-tree, the bark of which had been eaten away. This at once suggested to me whether the female before depositing her eggs may not decorticate a small portion of the trunk for the purpose of depositing? I did not see a single specimen on the wing, and in many cases I found the elytra so hard to open that they seemed soldered; nor could I by exposure to the sun or any other means ever induce the perfect insects to take wing; they always crawled. So far I have dealt with the insects; I may now add, in reply to some remarks communicated by you in your minutes, that Mr. Keit, the Botanical Curator of our Gardens here, recommended by Dr. Hooker, says that he sees no cause whatever to believe the trees die from any want of vitality, nor do they seem specially affected in any way, yielding good crops and looking well till the borer has very often emerged, after which they languish and die rapidly. I hear from other managers, *on strong soils*, that very often on one aspect, N. and N.E., they find the developed grub as much as 90 per cent., but that, in the same valley, the opposite slope, S.W. and S.E. (our cold slopes), the insect is *not*

present above 5 per cent., although the mortality of the trees is about the same. From this I gather either that the insect a secondary cause, or that the cold aspect is not favorable to the development of the insect beyond the stage when they have damaged the bark, and so more or less killed the tree. On slopes it is noticeable that the lowest side of the tree is that attacked, where by washing from rains the more tender bark is exposed, and very likely the drought cracks it a little. My proposed remedies and *modus operandi* for the prevention of this evil are as follows:—1. To remove all trees which are visibly affected before the insect matures. This, through non-comprehension of the cause of disease, was not done, and our estate and the adjoining one have suffered by the presence of so many centres of evil left to take effect upon the surrounding coffee. 2. About the time the egg or young is still in or under the bark, to keep a staff of men rubbing the trees round the roots with iron gloves, or sticks, with sand, so as to crush the insect in its larva-state. 3. About the time the insect emerges, to keep boys hunting for and picking off the beetle as it adheres to the tree. 4. To let the same boys search for newly-made holes of emergence, and pass wires, &c., down them, so as to destroy the insects therein, in case the beetle should have the habit of re-entering the hole as a *cache* during the day. Your member's suggestion as to the non-destruction of insectivorous birds is a very good one; but I am afraid they are too few, or rather the insect-life is so immense, that they will not play a very important part in helping us. No one shoots birds in the bush round us." Referring to one of the modes adopted by Mr. Gooch for killing the larvæ, Mr. Dunning suggested that rubbing the bark of the trees round the roots, as stated, would hardly have the desired effect, and would probably damage the tree more than the insect. Dr. Horn (of Philadelphia) also doubted the efficacy of the remedy of inserting wires in the holes, which he compared to shutting the stable-door when the steed was stolen. He stated that in Philadelphia a public park had been planted with a great many different kinds of exotic trees, and amongst them were some pines, which were all destroyed by two of their native species, Callidium antennatum and Monohammus dentator. None of their native trees suffered, but the foreign Coniferæ were killed immediately. Dr. Horn also stated that it was his belief that the Longicorns

attack healthy trees, and that the Coniferæ in question had been previously noticed as the finest and healthiest young trees in the park. The lime trees from Europe were also destroyed in a similar manner by hosts of Saperdæ. Mr. M'Lachlan repeated what he had stated on a former occasion, that European entomologists generally were of opinion that the majority of the European species of Longicorns do not attack living trees while in a perfectly healthy state.

Proceedings of the South London Entomological Society.—The half-yearly meeting took place on the 18th of June, under the presidency of Mr. J. R. Wellman. The secretary's report was read, and proved to be highly satisfactory. Donations of books from Sir John Lubbock, Bart., M.P., Mr. Edward Newman, and Mr. Charles G. Barrett, were thankfully acknowledged. During the half year seventeen volumes have been added to the library, including Walker's 'Diptera,' 3 vols.; Stainton's 'Tineina' (vol. iv. of 'Insecta Britannica'); Rye's 'Beetles;' several volumes of the 'Weekly Intelligencer;' and the 'Transactions of the Norfolk Naturalist's Society—Supplement, Lepidoptera.' Fifteen new members have been elected, and three have resigned. Amongst the most noteworthy insects exhibited at the meetings were—a specimen of Hydrilla Palustris, taken at Norwich, 1871; Macaria alternata, two specimens, taken near London, June, 1874; Erastria venustula, at Loughton, 1874; Ephyra orbicularia; larvæ of L. quadra, E. debiliata, A. præcox, S. Semele, and many others beautifully preserved, by Mr. Hoey. Mr. Cole also exhibited a fine nest of Vespa Crabro, from Thetford, in Norfolk. The Society's first annual excursion will take place on August 3rd, to Three Bridges, for Tilgate Forest.

British Bee-keepers' Association.—This Association was instituted, May, 1874, for the encouragement, improvement and advancement of bee-culture in the United Kingdom, particularly as a means of bettering the condition of cottagers and the agricultural labouring classes, as well as the advocacy of humanity to the industrious labourer—the honey-bee. It will hold its first great exhibition of bees and their produce, hives, and bee-furniture, at the Crystal Palace, September 8th, 9th, and 10th, 1874, being the days of the autumn fruit and flower show.

THE ENTOMOLOGIST.

No. 133.] SEPTEMBER, MDCCCLXXIV. [Price 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. Hubert Herkomer *née* Weise.

Fig. 14.

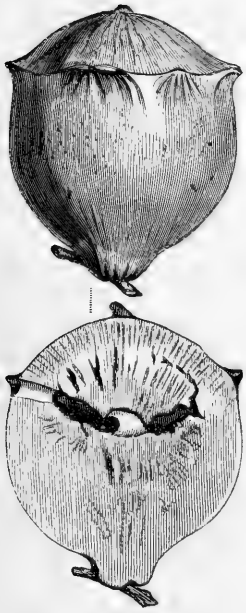
Trigonaspis megaptera.

14. *Trigonaspis megaptera.*—Only once, many years ago, I have found several specimens of this red, berry-like gall, growing between the cracks of the bark at the lower part of the stem of an old oak. It is spherical, of the size of a pea or smaller, red, very sappy, and contains a larva cell. This gall only lasts a very short time, the wasp already leaving it in June. After this escape the gall shrivels up and gets brown.—*G. L. Mayr.*

The associates which live externally or internally with the house-holders of oak-galls are here briefly mentioned: they, and the house-holders, will be noticed more in detail elsewhere, with the help of Dr. Mayr's progressive work on galls and their in-dwellers. Of this work three chapters are published: one on oak-galls, another on Synergus and the allied genera, and another on the Torymidæ. He states that Callimome Erucarum, C. nobilis (=Roboris), and C. amœnus, are parasites of Aphilothrix Radicis; that C. nobilis is a

parasite of Biorhiza aptera; that C. nobilis is a parasite of Aphilothrix Sieboldi; that C. Erucarum, C. abdominalis, and C. regius, are parasites of Cynips cerricola; that Megastigmus dorsalis is a parasite of Dryophanta macroptera and of Andricus noduli; and that Callimome amœnus, C. flavipes, and Syntomaspis fastuosa, are parasites of Trigonaspis megaptera. Synergus pallicornis associates with Cynips Hartigi, S. pallidipennis with Cynips conifica, and S. thaumacera with Trigonaspis megaptera. I mentioned T. megaptera and some of its parasites many years ago, when I observed the gall on oak trunks, near London; and I saw it again this year in May, near Lanark: it was mostly near the ground, and in no case above the height of six feet. In the beginning of June thirty-six males and females of T. megaptera appeared, and towards the end of this month they were followed by five or six females of Synergus thaumacera.—*F. Walker.*

Fig. 15.



Cynips argentea (and in section).

Developed on the young shoots, out of terminal or axillar buds.

15. *Cynips argentea.*—This large, beautiful gall is found in the axils of Quercus pubescens (very rarely in those of Q. sessiliflora), in the country round Vienna. It is seldom met with there, but occurs more frequently in Southern Europe. It is spherical in shape, and measures seventeen to thirty millemetres in diameter. Around the short-conical, blunt and bossed tip, which is exactly opposite the basal attachment, there is a border or crown, from which the parallel radius to the middle of the gall measures ten to fifteen millemetres. This border is garnished with short blunt points, and is generally less than the greatest circumference

of the gall. The gall is hard, has a slightly flat crown, and is covered with a white tinge caused by a delicate exudation. A section of the mature gall exhibits a dry, spongy, brownish yellow parenchyma, which is cracked across the centre. It contains the inner gall with the perfect insect, and adheres but loosely to the reticulation. Late in the autumn the gall is mature, remains on the branch, and is pierced by the perfect insect in the following February.—*G. L. Mayr.*

I have already published some notes on the inhabitants of this gall, which is called "crowned gall." Synergus melanopus, S. Reinhardi, and S. pallicornis, are stated by Dr. Mayr to keep company with C. argentea, and he mentions Callimome regius and Megastigmus stigmaticans as its parasites. Many years ago several galls of C. argentea, from the neighbourhood of Naples, were given to me by the Rev. F. W. Hope, and I obtained from them two specimens of C. argentea, one Megastigmus stigmaticans, one Diomorus calcaratus, one Osmia, one Hylæus, one other aculeate Hymenopteron, and one Fœnus. Most of these insects—perhaps all, with the exception of the first and the second—belong to the second epoch of the gall, or constitute the after-life in it. I found, in June, 1872, a few of these galls at Albano and Terni, near Rome, and shortly afterwards Synergus pallicornis came out of them in abundance, and a few females of Megastigmus stigmaticans, which I formerly described as M. giganteus, that MS. name having been given to it by Kollar. I also procured from these galls Eurytoma squamea (?) (smaller than the usual size), E. coronata, n., Pteromalus lucidus (?), P. albidipes, n., Eupelmus spongipartus, Tetrastichus coronatus, n., and Chrysis dichrous,—for this name I am indebted to Mr. F. Smith. Descriptions of the three species here mentioned as new are deferred. Eurytoma coronata belongs to the group formerly named Isosoma; Eupelmus spongipartus, *Foerst.*, hardly differs from E. urozonus, except in the slightly longer oviduct,—I am indebted to Dr. Mayr for the name of it.—*Francis Walker.*

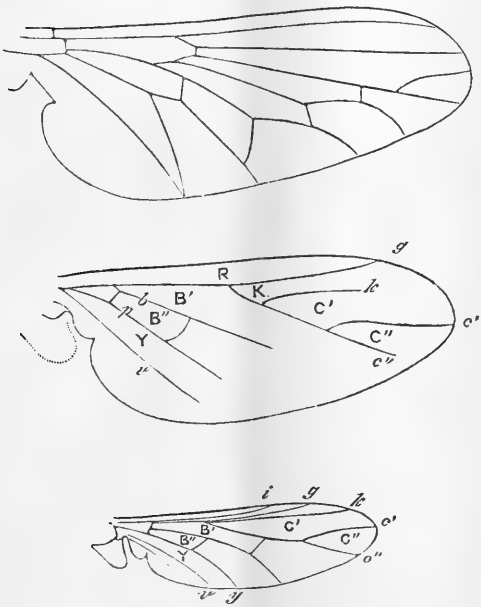
Notes on the Wing-bones of the Two-winged Flies.

By Francis Walker, Esq.

(Continued from p. 149.)

Bones.	Areolets.
j Mediastinal.	B Subcostal.
g Subcostal.	K Radial.
k Radial.	C′ Cubital, 1st.
c Cubital.	C″ Cubital, 2nd.
c′ Cubital, 1st branch.	B′ Præbrachial.
c″ Cubital, 2nd branch.	B″ Pobrachial.
d′ Præbrachial, 1st branch.	D′ Subapical, 1st.
d″ Præbrachial, 2nd branch.	D″ Subapical, 2nd.
m Pobrachial, 1st branch.	Y Anal.
y Pobrachial, 2nd branch.	V Subanal.
v Anal.	I Discal.
w Subaxillary.	

Fig. 31.—Cyrtus.



Figs. 32 & 32*a*.—Acrocera.

Fig. 33.—Henops.

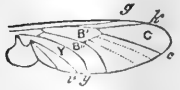
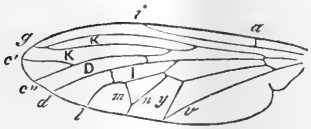


Fig. 34.—Oncodes.

Fig. 35.—Laphria.



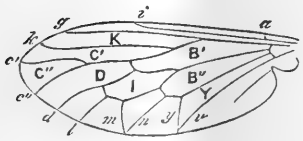


Fig. 36.—Dasypogon.

Several of the Stratiomydæ, such as Nemotelus, are of slow and feeble flight, but Acrocera, Oncodes and Henops are still more weak on the wing, as may be supposed by the structure here represented, and their other movements are also very inactive. In Cyrtus, on the contrary, the bones are much more numerous, and extend to the border of the wing: the first branch of the pobrachial joins the bone that is between it and the second branch, and thus there is a closed areolet behind the discal, forming one of the four externo-medial

areolets. The Asilidæ generally, including Laphria and Dasypogon, are distinguished by the completeness of their wing-structure, by their powerful flight, by their robust bodies, by their thirst for blood, and by their lancet-like mouths, from which the wing-case of beetles is not always a sufficient defence: they chiefly abound in hot regions, where they help to maintain the balance of life, by limiting its excess in some forms. The radial areolet is open in Dasypogon, closed in Laphria and in Asilus; in the first genus the radial and subcostal bones are separate, in the second and third they are united before they reach the border. The resemblance between the wing of Rhyphus and that of Leptis has been already remarked: in the former there are two radial areolets, one cubital areolet, and the anal areolet is open to the border; in the latter there are one radial areolet, two cubital areolets, and the anal areolet is closed before the border.

FRANCIS WALKER.

Occurrence of Butterflies at Dry Drayton, in the Months of March, April, May, June, 1874. By the Rev. F. A. WALKER, M.A.

1. *Pieris Brassicæ.*—April 7, 23, 25, 27, 28, 29; May 17, 18, 21, 31; June 1, 2, 3, 4, 5, 6, 7, 21, 27. Observed on nineteen different days in April, May, June.

2. *P. Rapæ.*—April 20, 21, 22, 23, 24, 25, 26, 27, 28; May 2, 8, 18, 21, 22, 24, 31; June 2, 4, 5, 6, 7, 21, 27. Observed on twenty-three different days in April, May, June.

3. *P. Napi.*—April 25, 27, 28, 29; May 1, 5, 6, 17, 18, 29; June 5, 9. Observed on twelve different days in April, May, June.

4. *Anthocharis Cardamines.*—April 29; May 16, 18, 21, 22, 24, 26, 30, 31; June 2, 3, 9. Observed on twelve different days in April, May, June.

Total number of appearances of Pieridæ, sixty-six.

5. *Gonepteryx Rhamni.*—Male: March 18, 23, 24, 28; April 3, 20, 21, 22, 27, 28; June 5(?). Observed on ten different days in March and April, one in June; but my eyes might have deceived me concerning this last appearance,

which might have been that of a Pieris in the sunlight. Female: March 28; April 23, 27. Observed on three different days in March and April. Total number of appearances of Gonepteryx, fourteen.

6. *Vanessa Io.*—March 23, 28, 29 (hybernated); April 3, 7, 8, 22, 23, 24, 27, 29; May 24. Observed on twelve different days in March, April, May.

7. *V. Polychloros.*—March 28 (hybernated); April 11, 21, 22; May 2. Observed on five different days in March, April, May.

8. *V. Urticæ.*—March 24, 28 (hybernated); April 20, 21, 22, 23, 24, 25, 26, 27, 28, 29; June 3, 27. Observed on fourteen different days in March, April, June.

Total number of appearances of Vanessas, thirty-one.

9. *Pyrarga Egeria.*—April 23. Observed on one day in April.

10. *S. Megæra.*—May 20, 30, 31; June 1, 2, 4, 9. Observed on seven days in May and June.

11. *Cœnonympha Pamphilus.*—May 30. Observed on one day in May.

12. *Satyrus Janira.*—June 19, 22, 23, 25, 26, 27, 29. Observed on seven different days in June.

Total number of appearances of Satyridæ, sixteen.

13. *Chrysophanus Phlæas.*—April 22. Observed on one day in April.

14. *Polyommatus Alexis.*—June 9, 11. Observed on two days in June. Total number of appearances of Polyommatus, two.

15. *Pamphila Sylvanus.*—June 9. Observed on one day in June.

Occurrence of genera:—Pieridæ, seen sixty-six times; Vanessas, thirty-one; Satyrids, sixteen; Gonepteryx, fourteen; Chrysophanus, once; Polyommatus, twice; Pamphila, once. Total number of appearances, one hundred and thirty-one.

Of the said diurnal Lepidoptera, the three common species of Pieridæ would appear to occur most uninterruptedly when they do arrive, but they are by no means the earliest seen. Compare the following:—Gonepteryx Rhamni, earliest seen, March 18; latest seen, April 28 or June 5 (uncertain, however). Vanessa Io, earliest, March 23; latest, May 24.

V. Urticæ, earliest, March 24; latest, June 27 (disappearing the whole of May). V. Polychloros, earliest, March 28; latest, May 2. Pieris Brassicæ, earliest, April 7; latest, June 27. P. Rapæ, earliest, April 20; latest, June 27. P. Napi, earliest, April 25; latest, June 9. Anthocharis Cardamines, earliest, April 29; latest, June 9.

The remaining five species were only seen once each; and of the ten, previously mentioned, I noticed five during the first fortnight in July, namely,—Pieris Brassicæ, P. Rapæ, P. Napi, Vanessa Urticæ, and Satyrus Janira, as well as two additional species that I had not observed from March to June inclusive,—Satyrus Hyperanthus, July 3 and 4, and Thecla W-Album, July 10.

From the foregoing statistics it will be perceived that of the above fifteen species, so far at any rate as my own observation went, Gonepteryx Rhamni (male) was the earliest seen, on the 18th of March, and Polyommatus Alexis and Pamphila Sylvanus the two latest, on the 9th of June. That the two kinds, moreover, most frequently noticed, were Pieris Rapæ, seen on twenty-three days, and P. Brassicæ, on nineteen; next to these, Vanessa Urticæ and Gonepteryx Rhamni, seen respectively on fourteen days; and next, Pieris Napi, Anthocharis Cardamines, and Vanessa Io, which were each observed on twelve days. Also that of the tribe of whites, which, as regards the number of individual specimens, do not appear to be particularly numerous this season, Brassicæ occurred nearly a fortnight before Rapæ, more than a fortnight before Napi, and three weeks before Cardamines; that Rapæ was seen five days before Napi, and Napi in its turn four days before Cardamines; that the earliest Satyrid (P. Egeria) was observed nearly a month previous to any of its congeners, on the 23rd of April, later than two species of Pieridæ, Brassicæ, and Rapæ, and earlier than another two, Napi and Cardamines; that the three remaining species of Satyridæ were later than the two latest species of Pieridæ; that Megæra occurred ten days before Pamphilus, and thirty days before Janira; that Pamphilus and Egeria were only seen once each, but Janira and Megæra seven times in each case,—the appearances of Janira, however, being restricted to June, and Megæra, on the other hand, ranging over the two months, May and June, being noticed three times in the

former month, and four in the latter; that of the three species of Vanessa, Io appeared one day before Urticæ, and five days before Polychloros; that Polychloros, the latest of the Vanessas, was seen between three and four weeks before the earliest of the Satyrids, Egeria, and eleven days before the earliest of the Pieridæ, Brassicæ; that no one of the said fifteen species was seen by me during all the four months in question,—March, April, May, and June, some being seen during the space of three months, some for two, and others during only one; and that as regards the number of specimens seen, Satyrus Janira was decidedly the most abundant; and that on no one day were more than seven species observed. Compare also the following:—

March 1st—17th, no species seen; 18th, one species seen; 23rd, two; 24th, three; 28th, four; 29th, one: appearances, eleven. April 3rd, two species seen; 7th, two; 8th, one; 11th, one; 19th, one; 20th, three; 21st, four; 22nd, six; 23rd, six; 24th, three; 25th, four; 26th, four; 27th, seven; 28th, five; 29th, five: appearances, fifty-four. May 1st, one species seen; 2nd, two; 5th, one; 6th, one; 8th, one; 16th, one; 17th, two; 18th, six; 20th, one; 21st, three; 22nd, two; 24th, three; 26th, one; 29th, one; 30th, five; 31st, four: appearances, thirty-five. June 1st, two species seen; 2nd, four; 3rd, three; 4th, three; 5th, four; 6th, two; 7th, two; 9th, five; 11th, one; 19th, one; 21st, two; 22nd, one; 23rd, one; 25th, two; 26th, one; 27th, four; 29th, one: appearances, thirty-nine. Aggregate of appearances:—March, eleven; April, fifty-four; May, thirty-five; June, thirty-nine. So that in March butterflies appeared only on five days out of thirty-one; also that in the ninety-one days of April, May, and June, butterflies were seen on forty-eight days; not seen on forty-three. Also that on fifteen out of the thirty days of April butterflies were noticed, on sixteen out of the thirty-one days of May, and on seventeen out of the thirty days of June. In the first half of May the cold weather contributed greatly to their disappearance.

The average number of species witnessed, moreover, is higher in April than either May or June: as in April seven species were seen once; six, twice; five, twice; four, three times. In May six species were seen once; five, once; four, once. In June five species were seen once; four,

three times. Allowance must be made as regards the accuracy of the above, deductions for a few days absence, as well as engagements, precluding the power of observation.

In reference to the flowers especially frequented by the butterflies recorded may be mentioned:—In the early part of the season: wild hyacinth,—a favourite blossom for Io, Rhamni, Rapæ, Cardamines, and Phlæas; fruit-tree blossoms,—Io, Polychloros, and Urticæ; periwinkles,—Rhamni and Io. Later on in the year: Virginian stock,—Pieridæ and Janira; thistle blossoms,—Janira and Urticæ; species of dead nettle in the hedge-rows likewise much frequented by Pieridæ. I may also state that the caterpillars of Vanessa Io and Urticæ have been very abundant this year on the nettles in this parish and neighbourhood. I have already bred many specimens of the latter; those of the former are still in the pupa state. I subjoin the following dates:—

Vanessa Urticæ.—Butterfly on nettles; April 27th and 28th, supposed period of eggs deposited. Caterpillars taken on same nettles; June, first week. Chrysalids; June 13th to June 25th inclusive. Butterfly; July 2nd to July 10th; the perfect insect emerging in numbers during the last three of days specified.

V. Io.—Butterfly in neighbourhood of nettles; April 23rd and 24th, supposed period of eggs deposited. Caterpillars taken on same nettles; June 15th. Chrysalids; July 6th, 7th, 8th, 9th, and 10th. A large number still in the larva state.

In conclusion I have only to state that as regards the discovery of the caterpillars of Vanessa Io and Urticæ, I have given the dates of the earliest found, and where I could more certainly connect them with the presence of the butterflies, which I had previously seen fluttering in the locality. I continued to find the caterpillars of V. Urticæ up to the 19th of June, and those of V. Io up to the 3rd of July, and a few even on the 10th, on which I am writing.

F. A. Walker.

The Rectory, Dry Drayton,
July 10, 1874.

Entomological Notes, Captures, &c.

A New(?) Food-plant for Melitæa Artemis.—I have tried for the last three seasons to breed M. Artemis, on what I have always understood to be their usual food-plants, namely, Plantago lanceolata and Scabiosa succisa, but have never been able to succeed in getting a single larva to feed on these plants. Having obtained a few dozen larvæ in the spring of this year, I resolved to try a new food-plant: I supplied the larvæ with honeysuckle, on which, to my surprise, they fed up rapidly, and in due course attained the pupa state. From these pupæ I have bred a series of very dark imagos, varying both in size and colouring, not only from those I have taken in Sussex and Kent, but also from any that I have received or seen, either from the western and northern counties of England, or from Ireland or Scotland.—*H. Goss; Brighton, August* 20, 1874.

Apatura Iris in Monmouthshire.—Last week a friend of mine brought me two specimens of Apatura Iris, both males, which were taken in this neighbourhood: one was captured in the kitchen, and the other outside, but close to a house in the country. This insect was caught and seen very frequently near here some five or six years ago. The county is omitted from the list in your work on 'British Butterflies.'—*H. Stafford Gustard; Usk, Monmouthshire, August* 1, 1874.

Melanagria Galathea in Lincolnshire.—In your 'History of British Butterflies,' p. 79, you remark that hitherto you have no record of the occurrence of the marbled white, Melanagria Galathea, in this county. The following note may, therefore, be of interest:—On the 18th of July, when driving across the wolds between Rigby and Caistor, and near the highest part of the wold, I noticed numerous examples of M. Galathea flitting in rather a lazy, undecided manner along the hedge-banks bordering the road. Returning some hours later by a parallel road to this, about one mile to the eastward, and on the summit of the wold, I again came across numbers of this butterfly, both along the road-side and in old disused chalk-pits contiguous. They seem very partial to settling on blossoms of the thistle and knobweed (Centaurea nigra). Altogether, on both roads, I must have seen several scores. I only took one example, as I was not aware, at the

time, of its rarity in Lincolnshire. I never remember butterflies so scarce as they are this year, and this has generally been remarked in this neighbourhood. I spent ten days last month on the highest part of the Shap Fells, in Westmoreland, and although I sometimes walked twenty miles a day, and was constantly out of doors, scarcely came across a single butterfly of any description. One of my boys is collecting butterflies and moths, so that I was constantly on the look out, and did not overlook any.—*John Cordeaux; Great Cotes, Ulceby, Lincolnshire, August* 4, 1874.

Hepialus Velleda at Horsham, Sussex.—It may be interesting to entomologists to know that on the 15th August I found in the house a fine specimen of a female of the above species, which had been observed fluttering upon the blind of an open window the previous morning, and had probably flown in. I had always understood this to be quite a northern insect. The common brake is very abundant in the neighbourhood.—*David Price.*

Food-plant of Orgia gonostigma.—I wish to set right a small mistake in respect to the food-plant of Orgyia gonostigma. It states in some works that this species feeds on oak, but I find it feeds on blackthorn and hawthorn, the latter being preferred.—*Henry Robinson; 23, Court 6 House, Gosford Street, Coventry.*

Deiopeia pulchella in Sussex.—A young lady friend, who was looking over my collection of Lepidoptera a week or two back, noticed a specimen of this insect in my collection, which was taken in Somersetshire, September, 1848, and observed she had taken a moth like it about a month back. I asked her if she was quite certain, and she said she was, and sure enough she was right, for on my calling to see the specimen found it to be in fair condition and perfect, but a pale example. She took me to the spot two days ago, which is in a field of mixed herbage, surrounded by ditches, lying between Poling and Little Hampton, in Sussex, and not, I should have supposed, a very likely spot. She has kindly added the specimen to my collection. On referring she finds it was taken on the afternoon of the 28th of June: it flew up out of a patch of the Lotus corniculatus, and settled on a thistle. Being only a young collector she was not aware of the rarity at the time, so did not search for more. It must be

a specimen of the first brood; most of the recent records of its capture in England, if I recollect rightly, have given August and September. It will be curious if it turns up again this autumn, as it did two or three years ago.—*Samuel Stevens;* 28, *King Street, Covent Garden, August* 18, 1874.

Nola centonalis at Sittingbourne.—I have taken a few specimens of Nola centonalis at Sittingbourne, flying in the manner as described by Mr. Dalton in his taking of Albulalis, and in company with Acidalia Emutaria. Is not this a new locality for the species?—*W. Wigan; Wincheap, Canterbury.*

Eupithecia plumbeolata and E. valerianata.—A fortnight ago I had a ramble to Pilling Moss—and a long one it is—to look for Elachista Serricornella: on the middle of the moss grows in plenty Malampyrum arvense; I collected a bag-full of the flowers, hoping that eggs were laid upon them. Yesterday I had a collecting day in my bag, and found about thirty larvæ in all stages, and a few pupæ as well; and from my bag-full of Valerian I should think quite one hundred larvæ, mostly full fed, of Valerianata (Viminata); there were plenty of Endorea pallida and Phycis carbonariella: which was my reward for a long walk, a run with a bull, a good sweating, worried with flies and midges, as well as a great viper hissing at me amongst the long grass, before my stick went at it.—*J. B. Hodgkinson;* 15, *Spring Bank, Preston, August* 10, 1874.

Tapinostola Bondii at Lyme Regis.—I have taken Tapinostola Bondii at Lyme Regis, an entirely new station for it.—*W. H. Tugwell;* 3, *Lewisham Road, Greenwich, August* 1, 1874.

Acronycta Alni at Lyndhurst.—A fine, full-fed larva of this species was brought to me yesterday, by a man who had found it on some palings close to my house.—*H. Goss; Lyndhurst, July* 30, 1874.

Noctua sobrina in Rannoch.—I have had the good fortune to discover a new locality for Noctua sobrina, in a heathy place, some distance south of Loch Rannoch, Perthshire. Last spring I accidentally found an injured larva, which shortly afterwards died: it was so suggestive of the description given in Mr. Stainton's 'Manual' of N. sobrina, that I determined to work for the perfect insect when due. I was rewarded by taking several specimens, and also by obtaining a few eggs.

I find this species exceedingly local in its habitat.—*John T. Carrington; Poole Road, Egremont, Birkenhead, August* 1, 1874.

Pachnobia alpina in Rannoch.—I had the pleasure of capturing a specimen of this fine and rare species this summer in Perthshire: it was taken in the Breadalbane division (as divided by Dr. White in his 'Fauna Perthensis'), close to the summit of a mountain of upwards of three thousand feet in height. It may interest some of your readers to know that this was the only result of fourteen whole nights and several days spent at that height: I sugared each night, but it produced nothing but an occasional Noctua festiva. The nights spent at this altitude were alternate ones; the other evenings were occupied by sugaring in the valley where I stayed: these latter sugarings produced many moths, so that the paucity of insects at sugar on the mountains could not be the result of the bad season we have had in Scotland this year. Considering the result, and the extreme discomfort of mountain-tops at night, for I was many times enveloped in thick clouds for hours together, I do not think it worth while to work again for this cloud-loving species. I believe there are only four previous records of this species being taken in Great Britain, namely, the two named in the 'Manual,' a third taken by Mr. Eedle, on Schiehallion, in 1870, and one bred from a pupa found while hunting for Coleoptera, in Braemar, by Mr. Allin: these may be called accidental captures; so I feel the more pleasure in having gone for, and obtained, the species.—*Id.*

Pachnobia alpina in Rannoch.—I have again had the pleasure of taking this rare species in Scotland, on the same mountain that I took one in 1870. In the same week I had the misfortune to miss another in Glen Sassenach, on a mountain called Squapen. I believe this species occurs on all the high mountains in Scotland if they could only be well collected over; but the great difficulty is wind and rain, that prevent you doing much on the tops of the higher mountains. —*T. Eedle;* 40, *Goldsmith Row, Hackney Road, N.E.*

Erastria venustula at Horsham, Sussex.—On June 2nd I took eight of the above insect in St. Leonard's forest, at a part called "Roost Hole," about three miles from the town. I might easily have caught a hundred settled on the heath:

they flew very little before sunset, but about dusk they began to fly straight down the different paths by dozens, and I did not see any settled after this. I should have taken more, but I ran short of pins. I went again on June 6th, and took fifteen more,—all I saw then; and on June 9th I again took nine, some of which were very much faded, and I have not seen any since.—*David Price; West Street, Horsham.*

Captures in Sutherlandshire.—Thinking it may interest some of the readers of the 'Entomologist,' I beg to give you the names of the Lepidoptera that I took in Sutherland last month:—Cœnonympha Davus, plentiful on the bogs; Melanippe tristata, very plentiful on the side of the "burns;" and one specimen of Plusia Chrysitis. The Tristata were not black, but a dark dusky brown. Being on a fishing excursion I unfortunately only got a few specimens of these species.—*C. L. Adams; Walford Manor, Shrewsbury, Aug.* 15, 1874.

Machærium maritimum (Fam. Dolichopidæ).—Machærium maritimum was first named and described as a new genus and species by A. H. Haliday, in 1831; and its economy has been lately observed by Mr. Joshua Brown, of Bartonbury. The cocoons were found in the beginning of June, on the sands at a bay about two miles beyond the town of Weston-super-Mare: Mr. Brown kept them moist with a little salt water, and the flies came out during a week about the middle of June. The pupa is pale, about three and a half lines in length, decreasing in breadth from the head to the tip of the abdomen; the head and the thorax are large, and closely connected; there are eight abdominal segments, and the legs and rudimentary wings are distinct; the antennæ are two-thirds as long as the body, and much longer than those of the developed fly; the scape is thick; the flagellum is setaceous and black at the base. The cocoon is pale gray, elongate-oval, about six lines in length, smooth without and within, and appears to be composed of fine mud.—*Francis Walker.*

Microgaster in Brazil.—In Hymenoptera and Diptera there are often examples of nearly allied species inhabiting wide-apart districts of the earth. Microgaster, whose larvæ form little yellow cocoons attached to the skins of caterpillars, are well known in Europe, and I am indebted to Mr. F. Smith, of the British Museum, for a mass of white cocoons

from Catagalla, in Brazil. They are accompanied by an abundance of Microgaster that does not seem to differ from the one of Europe, but the cluster is much larger and more closely united, and looks like a compact tuft of cotton.—*Francis Walker.*

Note on Phylloxera Quercus.—Phylloxera Quercus will probably be soon observed more than hitherto in England, on account of the observations of Balbiani with reference to it, and on account of its affinity to the much-dreaded Phylloxera vastatrix, on which Riley has this year bestowed fifty-six pages in the sixth annual report on the 'Insects of Missouri;' yet he remarks that the full history of Phylloxera has yet to be written. Phylloxera is nearly allied to Chermes, on which Leuckart long ago made some interesting researches; and P. Quercus agrees with Chermes as to the mode of life in the winter generation. The appearance of P. Quercus this year was somewhat earlier than usual: it was abundant in the beginning of July, when, in addition to the generally-distributed whitish blotches caused by Orchestes Quercus, oak trees may be seen here and there with leaves covered by yellow spots, each of which, sometimes fifty in number on one leaf, shows the presence of a Phylloxera on the under side. There the mother sits, surrounded by concentric circles of eggs, sometimes one hundred in number, and in that case there might be five thousand eggs under one leaf; but this, perhaps, never happens: sometimes the mother has no eggs about her, and then the yellow spot is limited to the size of her body; sometimes the mother has disappeared from the eggs; sometimes a Scymnus (?) larva appropriates one by one the whole cluster of eggs, and then the mother has desolation all around her. Callipterus Quercus and Thelaxes dryophila appear now and then in company with the Phylloxera: the Thelaxes not only frequents oak-apples, but also feeds on incipient acorns, and on incipient galls of Dryophanta folii.—*Id.*

Rearing Larvæ in Earthenware Pots.—I suppose most entomologists have found jam-pots, or the ordinary garden-pots, covered with leno or muslin, and with a little earth at the bottom if the habits of the species require it, to be convenient in many respects for the rearing of larvæ not too young. They are especially suitable when twigs or stems of the

food-plant can be given, and where a daily supply can be had, rendering it unnecessary to place these in water, for many larvæ are apt to thrive badly on twigs so supported, and I think a daily turn-out, and a fresh supply of food is more healthful; in very hot weather it may be needful to renew the food twice a day. But I find one drawback, which I have not succeeded in removing, and which is particularly operative in the spring and autumn: larvæ are liable to crawl occasionally on the earthenware sides of the pots, and as these get cold they seem to chill the feet and claspers of young larvæ, and produce a species of cramp, or perhaps it may be a rheumatic ailment. Lining the pots with paper does not answer very well. Perhaps some other entomologists have noticed this annoyance, and devised a remedy. The rearer of larvæ cannot be too watchful for the appearance of several of the moths of the genus Tinea in his breeding-house; it is not sufficient merely to exclude the imagos from boxes and cages: guided by instinct, they deposit eggs on the gauze or zinc, and the larvæ, dropping through, prey upon the pupæ that may be below; should there be none, they will devour moss. I will not say that, in lack of other food, they may not even eat earth, like niggers of certain races, often discoursed upon by travellers.—*J. R. S. Clifford.*

Emelesia unifasciata at Cheltenham.—I took four specimens of Unifasciata here on the 19th. I think it is new to this district.—*W. C. Marshall;* 8, *Spa Buildings, Cheltenham, August* 22, 1874.

Death through the Sting of a Hornet.—The deputy coroner for the Reading division of Berkshire has held an inquest at Mortimer, a village near Reading, touching the death, under extraordinary circumstances, of Mrs. Sarah Merrett, a labourer's wife. Deceased was standing in the road near her house, when a hornet flew out from a nest in the bank and stung her on the right side of her neck. She went indoors, and a neighbour bathed her neck with water and vinegar. However, she fainted almost immediately, and expired in a few minutes, before a medical man could reach the house. Mr. G. H. Davis, surgeon, stated at the inquest that he knew Mrs. Merrett as a nervous, excitable woman, and he believed the immediate cause of her death was syncope, the result of a nervous shock caused by the sting of

the hornet. The jury returned a verdict in accordance with that opinion. Deceased was fifty years of age.

[This is one of the best authenticated instances of death from the sting of a hornet that I have ever met with, and I think admits of no doubt. The medical question of *shock* or *poison* is scarcely within my province, but I shall have occasion to say something of another sting shortly.—*Edward Newman.*]

Peat Insects.—If any of your readers could give me the names of any insects, Myriapods, or Arachnida, that have been found in peat, marl, or any of the later tertiary deposits of the United Kingdom, I shall be thankful. I am about to publish a list of all the fossils of the Upper British Tertiaries, and have only the following in my list, gathered from many sources:—Atopa cervina, Buprestis sp., Cassida sp., Chrysomela sp., Cimex sp., Coccinella sp., Copris lunaris, Cossyphus sp., Curculio sp., Donacia linearis, Dytiscus sp., Elater lineatus, Harpalus sp., Licinus sp., Oiceoptoma dispar, Oreina sp., Phryganea sp. The locality and matrix in which the forms are embedded is requested, as well as the names of the organisms.—*Alfred Bell; 5, Grafton Street, Fitzroy Square, July* 25, 1874.

Answers to Correspondents.

Miss A. Steele Perkins.—In the pursuit of moths and butterflies I am continually meeting with other beautiful or curious insects, about which I can obtain no information in this decidedly unentomological part of the country. I therefore write to ask if you will let me know whether there is such a thing as a beginner's book on Entomology, containing information as to the number, names, and natural order, of the great divisions of British insects; the habits, metamorphosis, &c., of the different classes; the number of species in each class; and the manner of collecting and preserving them.—*Anne Steele Perkins; Ashgrove, Ruabon, April* 21, 1874.

[As a *first* book, *quite for beginners*, the 'Insect Hunters,' price 2*s.* 6*d.*; as a complete introduction to the Science, Newman's 'Familiar Introduction to the History of Insects,'

price 12*s.*; for collecting and preserving only, Greene's 'Insect Hunter's Companion,' price 1*s.* 6*d.* There are a great many others, but they are either profound and learned books, unintelligible to beginners, or pleasant compilations by authors who have little or no practical acquaintance with the subject. The above three books are published by Mr. Van Voorst, and have been prepared especially to supply a want felt by all learners.—*Edward Newman.*]

C. Le Merle Adams.—*Palpi* (or feelers)—organs attached to the jaws of insects; *ciliated*—fringed with a series of parallel hairs; *pectinated*—furnished on one side with a number of stiff parallel branches resembling the teeth of a comb; *costal*—near or on the upper edge of the wing; *reniform*—kidney-shaped; *discoidal*—in the middle of the wing, not near its margin; *orbicular*—round; *glabrous*—smooth and shining; *dorsal*—on the back or upper surface; *isabelline*—the colour of a fawn; *lateral*—on the side; *reticulations*—fine marks like net-work. For explanations of this kind I may also refer to the books recommended in the previous note. There is no English work containing illustrations of most of the Lepidopterous larvæ.—*Edward Newman.*

Thomas Eedle and others.—I believe the nests sent this summer from Scotland to be those of Vespa sylvestris of Scopoli ('Sp. Insectorum,' vol. i. p. 460). I have particularly examined the series of perfect insects, males and workers, just brought by Mr. Eedle on his return from Rannoch. Entomologists, who are desirous of studying the species of British wasps, would do well to take the entire nest and all its contents, and, after having allowed the cyanide to do its work, to set and preserve every specimen, labelling them and their nests with a similar number, and not introducing a single specimen that was not actually killed *in* the nest. Mr. F. Smith, of the British Museum, and subsequently Dr. Ormerod, of Brighton, have laboured industriously to make the species intelligible: the discriminative remarks of the former, and the figures of the last-named author, are most praiseworthy. The difficulty of the subject, however, is very manifest, from the conflicting synonymy in Mr. Smith's own various papers. An unmistakable figure of the nest of this wasp will be found on plate vi. of Dr. Ormerod's 'British

Social Wasps,' and another on plate x. Mr. Eedle's specimens closely resemble the latter: they are attached to the common ling and heather so firmly that it would be next to impossible to remove them without injury. This species has the abdomen distinctly banded with black and yellow. I commonly find this species of wasp at the blossoms of the figwort (Scrophularia aquatica), and, by a singular coincidence, the Tenthredo Scrophulariæ of Linneus, a species similarly banded with black and yellow, and equally conspicuous, is also confined to the same genus of plants, the larva feeding on its leaves, the wasp on its nectar. Can the theory of mimicry help us here? Turning to Mr. Smith's 'Catalogue of Fossores,' I observe he says this wasp is very partial to the flowers of Ballota nigra; a fact I have never noticed.—*Edward Newman.*

H. J. H.—The hair-worm (Gordius aquaticus) is the adult, and not the larval state, which is singularly unlike the specimen sent: it is very short, being described as $\frac{1}{450}$ of an inch in length. I cannot pretend to any knowledge of this from personal observation. The female Gordius deposits her eggs in the water in long strings. I have lately seen specimens of this strange creature six inches in length, and not much thicker than a horse-hair: indeed, country people have often supposed, and asserted, these hair-worms to be horse-hairs, which had fallen into the water, and so become animated. When the rain came, after the late dry weather, I found these Gordii on strawberry-leaves, currant-bushes, rose-bushes, &c. very abundantly, tying themselves in most marvellous knots; and I have attempted in vain to explain that they did not fall from the clouds.—*Edward Newman.*

A. Hamilton.—In the 'Entomologist' (Entom. vii. 137) I find mentioned the parasite of the owl, and having caught a specimen this morning on a fern owl, I have great pleasure in forwarding it to you: the shuffling disappearance of the creature, remarked by your correspondent, describes its movements accurately. As I shall most likely have many opportunities of searching owls, I should like to know if you would like the specimens in spirit, or as I have sent the present one.—*A. Hamilton;* 13, *Park Street, Windsor, August* 18, 1874.

[The insect is Ornithomyia avicularia: it seems a very

general bird-parasite. Any specimens of this Dipterous parasite, sent like the present one, will always be acceptable, and very thankfully received.—*E. Newman.*]

W. J. Cope.—I enclose you an insect, which I shall be glad if you will name. It was found to-day in a coal-mine (Church Lane Colliery), near Barnsley, by a man called Timothy Naylor. I suppose it must have come in the timber used for props, which is foreign, and comes mostly from Norway. It probably would be in either the pupa or larva state. It settled on the neck of the man as he was knocking out the timber that supports the roof of the workings. It was injured in pulling it from his neck.—*W. J. Cope; Barnsley, August* 21, 1874.

[The beetle is Acanthocinus ædilis; one of the family of longicorn or capricorn Coleoptera.—*E. Newman.*]

L. D. J.—The minute animal attached to the butterfly, Epinephele Janira, is an Acarus. I believe it is the same as that found by the late Dr. Leach on the larger Tipulidæ, and named by him, Ocypete rubra (Linnean Transactions, vol. xi.). I cannot, however, feel certain of this, as it is very probable different parasites are attached to different genera. My knowledge of these minute Acari is very limited indeed.—*E. Newman.*

A. H. Bright.—Can any of your readers inform me whether A. Atropos appeared in England prior to the introduction of the potato by Sir W. Raleigh.—*A. H. Bright; Knotty Ash, Liverpool.*

[It is scarcely probable that the occurrence would be recorded before the moth had a published name, and, this being so, I fear we cannot expect much information.—*E. Newman.*]

W. Thomas.—The caterpillar is that of Acronycta Psi, the dagger moth.—*E. Newman.*

H. Jones.—The moth is Hadena dentina, the stone fly—Phryganea grandis.—*E. Newman.*

Metal Drawers for Insect Cabinets.—Can you, or any of your readers, tell me if any attempts have been made to construct cabinet drawers of metal? Wood, however well seasoned, being liable to shrink, is not a quite satisfactory material. Some time ago I had a box made of tin: the edge of the sides was bent over to hold an India-rubber tube,

against which a plain sheet of glass was pressed by clips; this was quite air-tight, but cumbrous, and not suited for a sliding drawer. It has since struck me that a very simple drawer might be made with an India-rubber band fastened all round the edge,—as in the tin tops made for jam-pots, which would fold over the glass and make an air-tight junction. I shall be much obliged for any suggestions.—*W. C. Marshall; 8, Spa Buildings, Cheltenham, August* 22, 1874.

[Practically I know nothing of the wood shrinking. I have three cabinets, aged respectively forty, thirty, and twenty years; neither has begun to shrink. If you pay a proper price (twenty-one shillings per drawer,—they cannot be made under), cabinets, I believe, never shrink. I do not write thus to exclude suggestions, but to inform beginners who may wish to avail themselves of my experience.—*E. Newman.*]

Extracts from the Proceedings of the Entomological Society of London, July 6th, 1874.

Sir Sydney Smith Saunders, C.M.G., President, in the chair.

Haltica ærata—Walnut eaten by a Lepidopterous larva.—Professor Westwood exhibited specimens of Haltica (Batophila) ærata, which he had found to be very injurious to young rose-leaves. Also a portion of a walnut attacked by a Lepidopterous larva, probably a Tortrix, but he was unable to name the species, as it produced only an Ichneumon. It was the first instance he had known of a walnut being attacked by any insect in this country. Mr. M'Lachlan suggested that the larva might be that of Carpocapsa splendana, a species which usually feeds on acorns; and Mr. Moore stated that he had bred that species from a walnut.

Yucca Moth.—Professor Westwood made some remarks on the Yucca Moth (Pronuba Yuccasella, *Riley*), of which some fifty specimens had been sent to him, in the pupa state, by Mr. Riley; but he had only succeeded in rearing three of them. He exhibited a drawing of a portion of the insect, showing the peculiar form of the palpi, which were specially adapted for collecting the pollen, which it transferred to the

stigmatic surface as the insect passed from flower to flower. He pointed out the great importance of the insect in the economy of nature, as it appeared to be the only agent by which the plant was rendered fertile. He directed attention to a description of the insect and its habits by Mr. Riley, in his 'Sixth Annual Report of the Insects of Missouri.'

Black Hive Bees.—Professor Westwood also exhibited some bees, which had been sent to him from Dublin, having been found attacking the hives of the honey-bees. They were smaller than the honey-bee, and black, and he considered them to be merely a degenerated variety of Apis mellifica. He suggested the probability of their being identical with the "black bees" mentioned by Hüber. Hüber also had spoken of bees, which he called "Captains," which were furnished with "coronets" on their heads; but he suspected that these coronets might have been merely the pollen which the insects had collected.

Scotch Coleoptera.—Mr. Champion exhibited Amara alpina and other beetles, taken at Aviemore, in Inverness-shire.

Turkey Carpet eaten by a Dipterous larva.—Mr. Grut exhibited larvæ, pupæ, and imago, of a Dipterous insect, which had been found, in the larva state, in an old Turkey carpet. The larva was very long, slender, and serpentiform, white and shining, and had somewhat the appearance of a wireworm, only much longer, and without feet. Professor Westwood thought it might belong to the genus Scenopinus.

Parasites of a Bat.—Mr. Bond exhibited some minute parasites from a bat, probably identical with Argas Pipistrellæ; and also some Acari from a small species of fly: both were from the Isle of Wight.

Variety of Thecla Rubi.—Mr. W. C. Boyd exhibited two specimens of Thecla Rubi from St. Leonard's Forest, differing from the ordinary type in having a pale spot in each fore wing.

Ash-leaves affected by a Dipterous Insect.—Mr. W. Cole exhibited leaves of ash affected by some small Dipterous larvæ (probably Cecidomyia), which caused the two edges of the leaflets to turn upwards and meet above, thus assuming a pod-like form. They were from West Wickham Wood.

Machærium maritimum.—Mr. F. Smith exhibited some earthen cocoons found in a salt marsh, at Weymouth, by

Mr. Joshua Brown. They proved to belong to a Dipterous insect (Machærium maritimum), one of the Dolichopidæ. They were found lying on the wet, salt sand or mud, and mostly fell to pieces when touched. [See p. 207.—*E. Newman.*]

Agrotera nemoralis.—Mr. S. Stevens exhibited specimens of Agrotera nemoralis and other Lepidopterous insects from Abbot's Wood, Lewes.

Death of Mr. Alfred Owen.—It is with the deepest regret I announce to the readers of the 'Entomologist' the death of my much-loved and valued friend, Alfred Owen. He died at Llanfairfechan, North Wales, on the 31st of July last, aged forty-two, after a few days illness, brought on through taking cold, which ended in an attack of congestion of the lungs. My acquaintance with him commenced about eight years ago, through our mutual liking for Lepidoptera; and since then we have passed weeks together at a time in the New Forest, Hampshire, and other localities, in pursuit of this study. Mr. Owen was in every sense of the word a thorough gentleman, an ardent lover of Natural History, and a most interesting and well-informed companion. He leaves behind him a most valuable collection of Lepidoptera, rich in varieties, in which he took peculiar delight. The last month of his life was passed at Llanfairfechan, with myself and family. He was anxious that I should record the capture of Acidalia contiguaria, at Penmaenmawr, by my son Henry, and afterwards both by himself and myself on the rocks between Penmaenmawr and Llanfairfechan. The locality of this insect I understand has not been before discovered, and those who possess specimens are indebted for them to my friend, Mr. Greening, of Warrington, who was fortunate in rearing and keeping up a breed from the eggs laid by a moth taken some years ago at Bangor, which moth is in the cabinet of my late friend. We also captured A. Ashworthii at the same spot, and Cucullia Absinthii in the garden of the house where we resided. The intelligence of the death of Mr. Owen will, I am sure, cause deep sorrow to many of your readers. As regards myself, in him I have lost a friend and companion such as can never be replaced.—*Samuel James Capper; Huyton Park, Huyton, August* 6, 1874.

THE ENTOMOLOGIST.

No. 134.] OCTOBER, MDCCCLXXIV. [PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

16. *Cynips hungarica.*—This species produces a spherical, rather hard yellowish brown gall, thirteen to thirty-five millemetres in diameter. Over the whole surface are scattered small conical excrescences: these are generally short, and either obtuse or slightly pointed; they are united by raised keels, which are more or less obtuse, and often rather indistinct. In some specimens the excrescences are strongly developed, while in others they are very indistinct. A section of the mature gall exhibits a brown spongy parenchyma, which has an irregular cavity in the centre; the thin-walled inner gall is seated there on a stalk proceeding from the reticulation. This, which is the largest one-chambered gall observed by me in the country near Vienna and in Hungary, occurs on Quercus pedunculata, falls off in the autumn, and is

Fig. 16.

CYNIPS HUNGARICA (and in section).

pierced by the perfect insect in the ensuing spring. However, I am not quite certain about this matter.—*G. L. Mayr.*

Synergus melanopus, S. pallicornis, and Ceroptres arator, are mentioned by Dr. Mayr as the inquilines of this gall; they all appear in May, the second year.—*Francis Walker.*

Fig. 17.

Cynips tinctoria (and in section).

17. *Cynips tinctoria.*—This species furnishes the Levantine ink-galls of commerce, but the galls we receive from Turkey differ in size and colour from those which grow in Central Europe. The gall in this neighbourhood is very much like small specimens of the last-described gall. It is from ten to fifteen millemetres in diameter, of a reddish brown colour, bare, and beset with subglobular, wart-like excrescences. It consists of a dense reddish brown reticulation, and grows together with the inner gall, which is woody, of a light yellowish colour, and well defined. It grows out of the axils of a shrubby form of Quercus subsessiliflora and Q. pubescens. In the latter end of autumn it is no longer firmly attached to the branch; therefore a great number are detached by the winter winds; nevertheless, some remain on the twigs until the spring. The perfect insect emerges in the spring.—*G. L. Mayr.*

Six species of Synergus are enumerated by Dr. Mayr as the associates of Cynips tinctoria, S. melanopus, Reinhardti, pallidipennis, Hayneanus, pallicornis, and vulgaris. The three following appear in the second year:—S. Reinhardti in June, S. pallicornis in May, S. vulgaris in March. Dr. Mayr mentions Callimome regius as the parasite of Cynips tinctoria.—*Francis Walker.*

Sphinx Convolvuli at Maidenhead.—It may interest some of your readers to learn that I took a fine male S. Convolvuli, on the morning of the 9th of September, at Maidenhead. I have never heard of one being caught here before.—*W. Harper; Norfolk Road, Maidenhead, Berks, Sept.* 12, 1874.

Notes on the Wing-bones of the Two-winged Flies.

By Francis Walker, Esq.

(Continued from p. 149.)

Bones.	Areolets.
j Mediastinal.	B Subcostal.
g Subcostal.	J Mediastinal.
k Radial.	K Radial.
c Cubital.	C′ Cubital, 1st.
c′ Cubital, 1st branch.	C″ Cubital, 2nd.
c″ Cubital, 2nd branch.	C‴ Cubital, 3rd.
d′ Præbrachial, 1st branch.	B′ Præbrachial.
d″ Præbrachial, 2nd branch.	B″ Pobrachial.
m Pobrachial, 1st branch.	D′ Subapical, 1st.
y Pobrachial, 2nd branch.	D″ Subapical, 2nd.
v Anal.	Y Anal.
w Subaxillary.	V Subanal.
	I Discal.

Fig. 37.—Leptis.

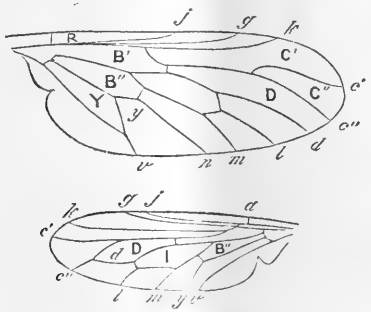


Fig. 38.—Bombylius medius.

Fig. 39.—Toxophora.

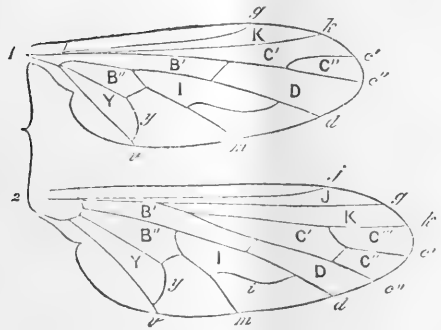


Fig. 40.—Nemestrina.

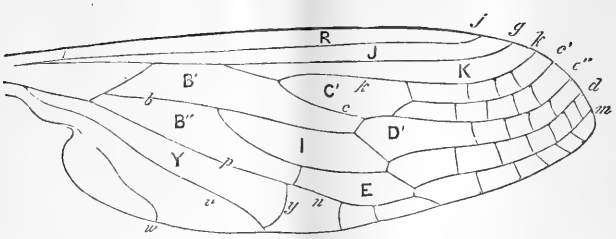


Fig. 41.—Scenopinus.

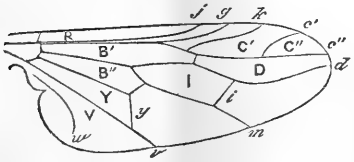
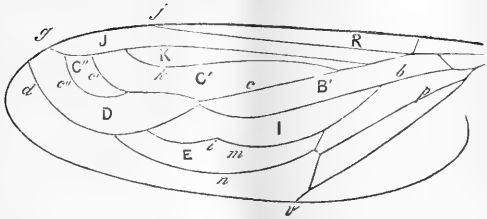


Fig. 42.—Hirmoneura.



THE Tabanidæ and Asilidæ are distinguished by their powerful flight, and the Bombylidæ (figs. 38, 39) are remarkable on account of their extreme quickness on the wing. In fig. 38 the first branch of the præbrachial bone joins the second branch of the cubital, and thereby the subapical areolet is closed far from the border of the wing. There is an

externo-medial bone in fig. 38, between the second branch of the præbrachial and the first branch of the pobrachial. In fig. 39 the subapical areolet is open, and the externo-medial bone, noticed in fig. 38, does not extend to the border, but closes the discal areolet at some distance from the border. In this figure there are three cubital areolets connected by means of a short additional transverse bone, and the mediastinal bone is apparent, so also the mediastinal areolet. In fig. 40 there is an extraordinary multiplication of bones, so that the wing has a dragonfly-wing appearance. The family represented in this figure has its highest development in South Africa, and several species of it occur in Central Asia, and among its relations it is especially suggestive of heat and of dryness of soil. In passing from fig. 40 to fig. 41 there is a transition from the greatest activity to the greatest inactivity of flight in the Diptera. The structure of the wing-bones is comparatively simple in fig. 41, yet not more so than in many genera whose flight is strong. In fig. 42 there is a great change in wing-bone structure: some of the bones are curved forward, the cubital bones do not extend to the border, the discal areolet is very long, and has behind it the second pobrachial areolet; the first and second cubital areolets are closed. The family Bombylidæ are well known by the great variety of structure of their wing-bones, and by the elegance of the markings in the bodies and in the wings. In some other more extensive families there is a comparative sameness of wing-structure, and consequently less variety of flight.

There is much interest in observing the very numerous modes of flight in the Diptera, and in comparing them with the differences of wing-structure by which they are occasioned. When the flight is most quick or powerful there are generally many wing-bones, but in some cases there is much strength of wing with few bones, and much weakness of the same when the bones are numerous. The bones are subservient to the muscles at the base of the wing and to the structure of the body, and all these are secondary to the electric currents, which, when active by heat, are the means of flight, the wing-bones being as conductors to them.

FRANCIS WALKER.

Our Common Wasps. By Henry Reeks, Esq., F.L.S.

There are four species of wasps, besides the hornet (V. Crabro), which I presume are very common, and generally distributed throughout the British Isles, namely, Vespa rufa, V. germanica, V. sylvestris, and V. vulgaris. Of these V. sylvestris is the connecting link between the ground-building and the tree-building wasps, as it does not confine itself particularly to either situation, although it is more frequently found building under the thatch, or tiles of walls, outhouses, &c.

I quite agree with you in advising your readers (Entom. vii. 211), where practicable, to take the whole nest, and examine and pin out at least a good series of the inmates: this is certainly advisable, and absolutely necessary with new or little-known species; but with the above-mentioned common species there cannot be much confusion,—unless books tend to make such confusion,—for they are so very distinctively marked, that when once known they can scarcely ever be mistaken again. I have no work on wasps, nor any specimens by me for scientific comparison, but I trust the following general remarks will enable most of your readers to recognize at a glance the common forms mentioned above:—

V. rufa has a black anchor-shaped mark down the middle of the face, without a dot on either side of the lower end of the mark. The abdomen is banded, as usual, black and yellow, with a dash of rufous on the 1st and 2nd segments, but most plainly on the 2nd. The black bands are very narrow, with a tongue-like mark of the same colour beneath and joined to each band, and with a conspicuous black dot on each side of the tongue-like projection. This species is the smallest of the four here mentioned, and builds its nest under ground, using sound wood for its construction, and working until very late in the autumn, even to the beginning of November.

The species most resembling V. rufa is V. germanica, but this is easily distinguished by its never having a perfectly-formed anchor-shaped mark on the face, and also by always lacking the rufous markings on the 1st and 2nd segments of the abdomen. The face of V. germanica is most commonly

marked with a black line, and with a dot on either side of it (thus .|.), but occasionally the line is wanting, and replaced by a third dot (thus .·.); otherwise the insects are much alike, in habits as well as appearance: both build underground, use sound wood, and work on until late in the fall. Both species may now be taken in abundance at out-door grapes, pears, fallen apples, &c., as well as in grocers' shops, and windows generally.

V. sylvestris has a clear yellow face, with one minute central black dot scarcely larger than the point of a pin, and in some specimens scarcely visible at all. The bands of black and yellow on the abdomen are of nearly equal width throughout, and wanting the tongue-like projections so observable in V. rufa and V. germanica, but the two small black dots in each yellow band are generally present, especially on the first three segments of the abdomen nearest the thorax. This species is therefore best known by its clear yellow face. It builds, as stated above, occasionally underground, but generally suspended from trees, roofs, &c., and uses sound wood; but the nests are deserted, and the males and workers dead, by the middle or latter end of August, so that the species could not be found now unless a queen were disturbed from her hybernaculum.

V. vulgaris very closely resembles V. sylvestris in the markings on the abdomen, but may always and easily be distinguished from that species by its well-defined anchor-shaped mark on the face. It builds its nest of rotten wood generally under-ground, but sometimes in hollow trees or in thatch, but never suspends it in the open air. The males and workers are never seen after August.

To sum up, V. vulgaris and V. sylvestris have the bands on the abdomen resembling each other, but the faces very different. V. vulgaris and V. rufa have both well-defined anchor-shaped marks on the face, but the abdomens are very differently banded. V. germanica and V. sylvestris occasionally approach each other in the markings of the face, but the markings on the abdomen will at all times distinguish them.

I would therefore advise your readers to collect a few specimens of V. germanica and V. rufa this autumn, before the males and workers die off; and next summer they may probably obtain V. sylvestris and V. vulgaris.

Of V. norvegica and V. arborea I know nothing practically, except that I met with the former, I believe, in Newfoundland.

HENRY REEKS.

Thruxton, September 8, 1874.

Entomological Notes, Captures, &c.

Captures at or near Eastbourne during the latter part of July.—Sesia chrysidiformis, one; worn. Spilodes palealis, about twenty; many much worn. Stenia punctalis perfectly swarmed the first day I was out (July 16th), and in good condition; but having only a few boxes, which I was reserving in the hopes of meeting with more Chrysidiformis, I only took some half a dozen; and when I went again about a week afterwards, during which it had been rather windy weather, I could only find a few very worn examples. The same remarks apply precisely to Xanthosetia Zoegana, Cochylis Francillana, and C. Dilucidana. I also took specimens of Lithosia complana, L. griseola, Pyrausta punicealis, P. purpuralis, Odontia dentalis, Endotricha flammealis, Cataclysta lemnalis (swarming), Botys fuscalis, B. asinalis, Spilodes cinctalis, S. sticticalis, Pionea stramentalis, Scopula ferrugalis, S. olivalis, Bryophila glandifera (commonly), Ephyra porata, E. pendularia, E. omicronaria, and Acidalia trigeminata. I never saw Lycæna Corydon in such abundance, whereas of L. Adonis, which I have before found plentifully there, I did not see a specimen.—*Geo. P. Shearwood; Cedar Lodge, Stockwell, S.W., September* 6, 1874.

The Butterflies of Dry Drayton.—I am sure all those who take an interest in our British butterflies will duly esteem the valuable observations published by the Rev. F. A. Walker; and it is much to be wished that entomologists who are resident in country districts would follow this good example, and tabulate each season the times of appearance of such butterflies as come under their observation,—no difficult matter, as few have in any district more than fifty of our species. Such chronicles will not only add to our entomological lore, but throw light on the connexion between weather phenomena and insect life. If there is an omission in the

paper on the butterflies of Dry Drayton, it is that of information as to the nature of the district, how much of the land is cultivated or pasture, &c., the prevalence or absence of wind, the elevation, soil, and the character of the Flora. Should similar papers be hereafter prepared, some brief particulars of that kind would be acceptable.—*J. R. S. Clifford.*

Vanessa Antiopa near Newcastle.—Vanessa Antiopa has been seen, but not captured, by the person to whom I am indebted for the specimen I possess. It appeared on the 11th of September, within a few yards of the spot—in Jesmond Dene, near Newcastle—where he made the capture two years ago; willows abound in the neighbourhood.—*W. Maling; 22, Jesmond Road, Newcastle-on-Tyne, September* 17, 1874.

Argynnis Niobe in Kent.—Your correspondent, Mr. Wigan, thought it necessary, I presume in his own defence, to indicate the locality, though not with precision, where he took this butterfly; still, it is to be regretted that the result will be a hunting-up of the spot, and a hunting-down of the luckless A. Niobe, which is likely to have a short history, though an interesting one, as a British species; for though ravines or hollows, such as the one described, occur in other parts of Kent, the insect is so closely connected with the wild heart's-ease that it is not probable we shall find it where that plant does not grow pretty freely; and, as far as I have observed, it does not appear to be common in the county. However, I will venture to express a hope that the next captor of A. Niobe will keep the exact spot a profound secret; for as Carlyle observes:—"He who has a secret must not only hide it, but he must hide that he has it to hide."—*J. R. S. Clifford.*

Postscript, September 19th.—Some entomologists are much "exercised in spirit," as the old authors used to say, over the recent capture of this butterfly in Kent, and seem to fancy there is still a loophole for doubt. I would suggest an easy settlement of the question. It may be premised that the captures made this year in the place named could not have exterminated the species, as it had, according to the account published, been on the wing some time. There must, therefore, be larvæ in the locality, and within a limited range of the spot where the imagos were

taken. If the gentlemen who have made acquaintance with Argynnis Niobe will associate with themselves one or two entomologists of known skill in larva-hunting, and, without indicating the precise position of the valley or hollow between Wye and Ashford to the entomological world generally, arrange to make a careful united search for the larvæ of A. Niobe during the spring, we may possibly get a result conclusive enough to satisfy all sceptics.—*J. R. S. Clifford.*

[I think Mr. Clifford can never have hunted for the larvæ of Aglaia or of Adippe, or he would scarcely have proposed so hopeless a task as seeking for those of Niobe.—*E. Newman.*]

Food-plant of Orgyia gonostigma.—May I venture to remind my friendly correspondent, Mr. Robinson, of the old saying, that "latet dolus in generalibus." Had I been disposed to generalise a short time ago, with reference to the food-plant of the species cited, I should have said, speaking of it from a knowledge of its habits in the Wimbledon locality, that probably its proper food-plant was oak, though it might occasionally be found on the hazel in summer, and on sallow in spring. I know that in confinement Wimbledon larvæ take oak by preference. Now, at Coventry, O. gonostigma chooses, as Mr. Robinson finds, blackthorn and whitethorn, preferring the latter. And my friend, Mr. Barrett, of the South London Entomological Society, who was acquainted with the Doncaster locality, tells me that there the larvæ were taken on the whitethorn. Were the species to become more common with us, we might discover that—like its near relative, O. antiqua—this is inclined to be a general feeder. The apparent difficulty in the way of its increase in England is the peculiarity of its life-history; the hybernation, which carries it through the cold months, endangering the lives of many of the larvæ, as they seem to protect themselves very slightly. As most breeders know, by a little management, the larvæ of O. gonostigma may be got to feed up the same year in which they are hatched; but I have been pursuing an investigation of some slight interest, namely, to ascertain if, at any point we please during the larval growth, we can, by placing them in a lower temperature and withdrawing the food, induce individuals to become torpid. Though hardly able to say as yet that my experiments are conclusive, so far as they have gone they would show

that, after the last ecdysis is passed, the larvæ must then either attain maturity in the autumn, or, if not allowed to do that, they will die off. I should much like to be informed what reasons subsist in proof of the theory, propounded by the old naturalists, that the female of O. gonostigma, like that of Liparis auriflua and other species, clothes her eggs with down, because the scorching rays of the sun might prove injurious to them.—*J. R. S. Clifford.*

Food-plant of Orgyia gonostigma.—In the last number of the 'Entomologist,' Mr. H. Robinson, of Coventry, kindly gives us other food-plants on which the larvæ of O. gonostigma will feed, namely, blackthorn and whitethorn; but I do not see how he can state that oak as a food for this larva is a mistake: we have always found it feed more freely on this than anything else. This season I have been very successful in getting all the larvæ of this species, that I had from eggs deposited by the first brood, into the imago state (unfortunately small specimens). These larvæ I supplied with oak and sallow, and I found that they fed very little on the former, while any of the latter was to be obtained. I certainly think that my success in getting all my larvæ to change into pupæ was on account of giving them a constant supply of fresh sallow. On one occasion I placed a few young larvæ of Gonostigma in a jar, with some other larvæ I had feeding on beech, and was not a little surprised to find that they ate this rather freely. I certainly, therefore, think that the larva of Gonostigma is, like that of Antiqua, a universal feeder.—*J. R. Wellman; 14, Portland Place North, Clapham Road, S.W., September* 23, 1874.

Do some of the Larvæ of Saturnia Carpini Hybernate?—Has it before been noticed that some of the larvæ of Saturnia Carpini apparently hybernate? In June I took a young brood, newly emerged, on the top of a little tuft of heather. They gradually came to grief, one way or another, all but two. Of these one is now full fed, and thinking about making its cocoon; the other is only about eleven lines long, and very small altogether: it has remained this size, and in the penultimate stage of colouring (yellowish green, and black markings), for the last five weeks; yet it eats, and seems quite healthy.—*W. D. Robinson-Douglas; Orchardton, Castle Douglas, N.B., September* 3, 1874.

Leucania albipuncta and Catocala Fraxini at Folkestone.—This year I have again had the pleasure of taking L. albipuncta at Folkestone, namely, single specimens on the 1st and 2nd of September respectively. I also had the unexpected good fortune of capturing at Folkestone, on the 5th of September, a worn example of C. Fraxini.—*Charles Oldham; Newton House, Amhurst Road, Hackney, September* 21, 1874.

Is not Dianthœcia Capsincola Double-brooded?—I took fresh specimens of D. Capsincola last May, and bred a long series last month from larvæ collected during July. I am taking the larvæ again now. Only one brood is mentioned—the August one—in Newman's 'British Moths.'—*J. A. Lilly; Paignton, September* 19, 1874.

Epunda nigra and Noctua glareosa at Sherwood Forest.—On the 27th of August I took a fine specimen of E. nigra at sugar: I took it when the moths were swarming, just after (or rather during) a thunder-shower. On the 7th of September I took Noctua glareosa in profusion on the heather: a friend was with me, and for several succeeding nights we found their numbers, to all appearances, undiminished.—*S. L. Mosley; Edwinstowe, September* 12, 1874.

Noctua sobrina and Pachnobia alpina.—In your notice of these moths from me in last month's 'Entomologist,' you say, at the head of each, "In Rannoch." That is an error, as neither species were taken in Rannoch, but both in Breadalbane, much to the south of Rannoch, where I did some successful collecting.—*John T. Carrington.*

Notes on Trichiura Cratægi.—The information we gain from books on the economy of this species is somewhat meagre and unsatisfactory, and it is probably owing to this that we find many cabinets without this insect. As far as my experience and information go, this species seems to occur pretty generally throughout the south-eastern counties of England. The moth leaves the pupal state from the 20th of August to the middle of September: it seems to emerge invariably between five and seven in the evening; the females remain almost motionless, but the males dash about excitedly for an hour or so between six and seven in the evening. They have, doubtless, a second flight in the small hours of the morning, though I cannot vouch for this. It is, however,

more than probable, from the fact that copulation does not take place till after midnight. The moths remain paired till five o'clock in the morning, a circumstance the most remarkable from the fact that the (British) species most closely allied to this remain in copulation but a very short time. The female does not begin to lay till the next day. The number of eggs deposited varies between one and two hundred: they are of a pale brown tint, thickly covered with dark-coloured down. The eggs hatch in the succeeding spring; some in my possession hatched this year, on March 24th. The larvæ feed on both whitethorn and blackthorn, but seem to prefer the former in a state of nature: they are generally full fed from the 10th to the 20th of June, when they may be found on the road-side hedges in company with Neustria, &c. The larvæ are very variable, and strikingly handsome. The cocoon of this species is composed of fine particles of earth, and is lined inside with a coating of white silk: it is very compact, resembling closely that of Pœcilocampa Populi.—*G. H. Raynor; Hazeleigh Rectory, Maldon, Essex, Sept.* 12, 1874.

Life-history of Ligdia adustata.—The eggs were laid during the third week in July; the caterpillars were hatched on the 1st of August. When full grown they usually rest in a straight position along the stem of their food-plant, Euonymus Europæus (common spindle tree), to which they have a marked resemblance in colour. The head is slightly larger than the 2nd segment; the face almost white, mottled with reddish brown, and surrounded by a band of very dark brown, which becomes lighter in shade as it approaches the 2nd segment; on each side of the head, in a line with the spiracles and adjoining the 2nd segment, is a patch of very dark brown. The 2nd segment is smaller than the 3rd, and the 3rd smaller than the 4th, from which to the 11th the body of the caterpillar is of uniform size, and then decreases. On the anterior dorsal area of the 5th, 6th and 7th segments there is a small square brown patch, edged on both sides with white; this marking occurs again, but very indistinctly, on the 10th segment. The sides of the 5th and 6th segments are ornamented with an irregularly-shaped patch of various shades of brown, interspersed with small white marks. The legs are brown; the first pair of claspers, together with the skin-fold above them, are also brown, the latter variegated

slightly with white; the anal flap and second pair of claspers are tinged with the same colour. The spiracles, which are very indistinct, are white, edged with brown. The caterpillars descended to the earth about the 25th of August, and spun a slight cocoon just below the surface.—[*Rev.*] *P. H. Jennings; 11, Maison Dieu Road, Dover, September* 7, 1874.

Life-history of Cidaria picata.—The eggs were laid in confinement, singly, on the leaves and stems of Alsine media (common chickweed), the last week in July. The young caterpillars were hatched on the 9th of August, and moulted three times, about the 16th, 23rd and 30th of the same month. When at rest they lie extended on the stem of the food-plant, and when disturbed assume the form of an Ionic volute. The body is nearly uniformly cylindrical throughout its length, slightly increasing towards the extremities. The head and face are of a light yellowish brown, marked with spots and short lines of a deeper shade. The colour of the back between the spiracles varies in different individuals from pale olive-green to reddish brown. The whole of this space is of two shades, the lighter represented by very irregular lines, at one time confluent and then separate, with very irregular edges. There is a black patch in the middle of the 7th, 8th and 9th segments: this becomes less distinct as the caterpillar increases in size, and in some cases altogether disappears. The sides below the spiracles and the ventral space are of a lighter shade than the back, the line of demarcation being well defined. The whole of this portion bears a considerable resemblance to the back, as far as the markings are concerned, being made up of very irregular lines of alternate lighter and darker shades. The legs and claspers are of the lighter shade. At the sides of the junctures of the segments there are spots of a much darker colour. The spiracles are black. The caterpillars disappeared about the end of the first week in September, making a slight cocoon on the surface of the earth, and changing to a chrysalis of a light reddish brown.—*Id.*

Cidaria picata Double-brooded in Confinement.—During the second week in this month (September) I had a few imagos of this insect emerge from the pupæ of a brood which fed up about the middle of August.—*Id.*

The Food of Arctia Menthastri.—I have seen larvæ of this

species on the currant-bushes in gardens, and often on the common lilac. It is not by any means restricted in its food to low plants; and hardly an entomologist has not, at some time or other, beaten it from the sloe or oak in the course of his researches. Young individuals of A. Caja will sometimes feed on various bushes in gardens during the autumn, taking to the low plants in the early spring. The individuals noted by Mr. Wittich may belong to the latter species.—*J. R. S. Clifford.*

Eupithecia Pygmeata.—On the 23rd of August I took a fine specimen of this insect at Witherslack. I also took it flying along with Grapholita obtusana the last week in May, which is the usual time of its appearance in this district. It seems quite strange to see the Helianthemum in full flower again, as well as the wild thyme: the hot weather soon burnt them up on the limestone, and since the rain has come on all seems fresh again. There were very few insects: Argyresthia spiniella, Coriscium cuculipennella, Gelechia similella, Laverna miscella, were among the best species I saw. The intense heat has quite killed lots of plants: I could not see a single gentian for Asychna profugella to feed on.—*J. B. Hodgkinson;* 15, *Spring Bank, Preston, September* 6, 1874.

Bombus Lucorum.—One evening last week, being on Shirley Common mothing, at about 11.30 p.m., I netted what seemed to be, by the light of the lantern, a moth hovering over the flowers of the bramble. On examining my captive more closely I found, to my surprise, that it was not a moth, but a humble-bee (Bombus Lucorum). Can any of your readers say whether it is usual for these insects to fly by night? I never before remember to have seen, or heard of such a habit.—*W. A. Forbes; West Wickham, Kent, September* 11, 1874.

Death from the Sting of a Hornet.—You certainly have some entomological readers in the neighbourhood of Reading. Could you not get them to investigate this case more thoroughly? Not that I think it at all improbable that a nervous, excitable person may die through the sting of a hornet, wasp, or bee; in fact, if I remember rightly, the Hon. Grantley F. Berkeley, some few years ago, recorded in the 'Field' newspaper the death of an old man from the sting of a bee. This occurred in the garden of Mr. Lovegrove, Waldron, near Lambourne,

Berks,—I think. What I want to know is this,—Was it a hornet or a wasp? I ask this because I never yet saw a hornet's nest in the ground, and never heard of an authentic instance of one being found in that situation. But then, on the other hand, I have never resided anywhere where hornets may be said to be very common; still I have known of some dozen nests within a radius of two miles, but none of them were in or very near the ground, but in roofs of cottages, outhouses, and in hollow trees; and these are decidedly the favourite resorts. Perhaps, however, Mr. F. Smith, or some other Hymenopterist, will kindly say if I am wrong. Anyone would think that even a child, who had once had a hornet shown him, could never again confound it with a wasp, or *vice versâ*; but you would be surprised at the ignorance, in this matter, of many well-informed persons, who certainly ought to know a wasp from a hornet, there being quite as much difference in size as between a hive-bee and a humble-bee (Bombus terrestris). Some years ago my friend the late Mr. S. Stone, wrote to me to find out some hornets'-nests, and I made several inquiries for him in the neighbourhood. One intelligent(?) keeper said that he did not *then* know of a hornet's-nest, but he had seen dozens of them in previous years; and he perfectly remembered one very strong colony, that attacked everyone who passed near the nest, which, he said, *was suspended from the under side of a fir-bough.* This statement at once floored all my previous faith in his tales of hornets, their nests and stings; and he likewise told me that on another occasion one crawled into his boot and stung his foot. That the hornet could raise a colony from a nest suspended in the open air is a simple impossibility; the first rough wind would blow its frail, but beautiful nest, constructed of rotten wood, to atoms. Even when taken for the cabinet it requires most careful handling, or it will crumble to pieces in the hand with only a very slight pressure. The sting of a bee or wasp has not the slightest effect on me, and yet I have a dread of being stung; but my youngest brother—who is very fond of bees, and can do almost anything with them—suffers severely if one stings him, causing him to turn purple all over, and with a dangerous swelling of the tongue; and yet the sting of a wasp has no ill effect upon him whatever.—*Henry Reeks; Thruxton, September* 7, 1874.

Argynnis Lathonia at Broadstairs.—I sent you Lathonia in great haste on Saturday evening, and may I beg your acceptance of it. I have taken five near Broadstairs, all in one field, between St. Peter's and Broadstairs. I took one three weeks ago in the same spot, which I sent to the Rev. P. H. Jennings, of Longfield Rectory. I do not know how they will travel, but they were all in good condition when caught.—*W. Wigan; Wincheap, Canterbury, September* 18, 1874.

[Mr. Wigan has my sincere thanks for this valuable present: it arrived in the finest state of health and activity. I trust that notice of any other captures of this butterfly will be sent as soon as made.—*E. Newman.*]

Smerinthus ocellatus emerging in September.—I had the larvæ of S. ocellatus feeding on apple through July: one turned to a pupa on the 31st July, and scarcely buried itself; it could be seen just under the surface of the earth, and came out on the 1st of September quite perfect, and the colours very clear and rich; a male, but certainly smaller than usual. Is it not an uncommon occurrence? I ought to have said that the cage was kept in a room with windows looking to the north and east, and the cage quite away from any sunlight.—*H. C. Hodges; The Cottage, Walton-at-Stone, near Hertford, September* 12, 1874.

[This is unusual, but I have known other instances.—*E. Newman.*]

The Plague of Ants.—Since so much has been written in the newspapers lately concerning the so-termed "plague of ants," perhaps the following may be of some interest:—When travelling from Plymouth to Falmouth a gentleman mentioned in the course of conversation that a remarkable incident had occurred to some friends of his, on the 20th of August last, when cruising in their yacht off the Longships Lighthouse, on the coast of Cornwall, about seven or eight miles from Falmouth. They said that they had sailed through millions upon millions of winged ants, and that the sea was for a long distance black with them; indeed, that they amused themselves for a long time in dipping them up in buckets, and that the waves that the vessel threw off from her bow in dividing the water were black instead of white. The following I copied from a Plymouth newspaper:—"*The Ant*

Invasion.—The ant invasion, described by so many, was observed in the north of Cornwall on Wednesday. Driving with my family and some friends to Redruthan on that day, we were surprised by a sudden gust of wind, bringing with it an immense swarm of winged ants, too many of which, for our comfort, located themselves upon us, and it was no easy task to get rid of them. Upon our arrival at Redruthan we found a large portion of the sand darkened with dead ants, evidently drowned; each receding wave left a wide mark along the beach."—*J. Gatcombe; Stonehouse, September* 5, 1874.

[I have described in my 'Familiar Introduction' how the male and female emerge from the pupa state at the end of August, furnished with wings. A report of this "extraordinary occurrence" and "unheard-of phenomenon" appears annually in our newspapers, just before the autumnal equinox.—*E. Newman.*]

Correction of an Error.—I am sorry to say that I was wrong in saying the galls, mentioned by me in the July number (Entom. vii. 165), were those of Cynips lignicola. A day or two after I sent you the notice the perfect insects emerged, thus showing that the gall had arrived at maturity. This gall, of which I enclose specimens, was very abundant on some oaks, near Edinboro', during the past summer. When fresh it is soft, succulent, of a green colour tinged with pink, and, unlike other galls, was by no means unpleasant to the taste. Can you tell me the name of its maker?—*W. A. Forbes.*

Answers to Correspondents.

*Miss L*****: Pollen Masses of Orchids.*—The "strange-looking objects" attached to the "tongue" (more properly maxillæ) of a moth are neither Fungi nor Acari, but masses of pollen from the blossom of some Orchid. These curious objects have frequently puzzled me in my early collecting days; but on one occasion in Birch Wood, being in company with the late William Christy, that accomplished botanist explained the seeming mystery. Long after this, and indeed until I read an abstract of Mr. Darwin's really wonderful observations, I had formed no conception of the meaning of this phenomenon. However, since the publication of his book, 'On the various

contrivances by which British and Foreign Orchids are fertilized by Insects,' I have given a good deal of attention to the subject, and examined a great number of insects whose mouths have been thus encumbered, and hope before long to print rather a long paper on fertilizing insects in the 'Zoologist,' as there certainly is not space enough for it in the 'Entomologist.' In the meantime I may give a few particulars here, leaving the general subject for a future paper. It appears from Darwin's work that scarcely any flower possesses the power of fertilizing itself; probably it will hereafter be shown that no flower or species has this power in perpetuity; but this subject need not be discussed here. It will be sufficient to explain that in Orchids there are but two stamens, and each of these contain one pollen-mass, or pollinium, as it is called by Darwin. The moths, attracted by the sweet scent of the flowers, and being thereby apprised of the nectar-banquet contained in the flower, often crowd around it, and, in their eagerness to get at the sweets, press their heads against the stamens, and thus the cuticle of the anther probably gets ruptured by the pressure, and the pollinium then comes out of its retreat, and being furnished at the lower extremity with a circular adhesive disk,—very much like those round pieces of wetted leather which boys play with on the flag-stones of our pavements,—these disks attach themselves to the head, eyes, or mouth of the moth, and, thus fixed, they project like little clubs, and are carried to another flower, to which the moth flies as soon as it has rifled the sweets of the first, and to this second flower it imparts the pollen it had taken from the first. The bright colours of flowers are given them to attract butterflies, bees, and flies, by day; the sweet scents of flowers are given them to attract moths by night: and, as though conscious of this duty, a great number of flowers—such for instance as the "night-flowering stock," the "night-flowering Cereus," the "night-smelling evening-primrose," &c.—only emit their fragrance when moths are on the wing. This is the case with Orchids,—those which have large, bright and beautiful, scarlet and yellow and purple flowers, and no scent—attract day-flying insects; those which have minute, and green or dull-coloured flowers have no beauty, but are almost invariably sweet-scented, and thus attract those moths which fly by night. Mr. Darwin has mentioned a specimen of Caradrina

that had eleven pairs of these pollinia attached to its maxillæ, and another of Acontia luctuosa that had seven pairs; each blossom possesses a pair, but they are frequently robbed of only one. I shall be very pleased to give any further information on this most interesting subject.—*E. Newman.*

F. W. White.—I shall feel much obliged by your kindly naming the accompanying larvæ, which were found feeding on pear-trees in a friend's garden at Cainscross. He also noticed them both last year and this. It appears that they become of a green colour after their last moult, and then pass into the ground to undergo their transformation.

[The insect produced from the grub is a sawfly, Blennocampa Cerasi.—*E. Newman.*]

Rev. John A. Kerr; Belfast.—The insect sent is Necrophorus interruptus, one of the burying-beetles.—*E. Newman.*

G. A. S.—The facts are interesting, but I cannot publish them anonymously. The mites are still alive, and apparently healthy. I cannot distinguish them from the so-called Acarus domesticus, which occurs in all our houses. It is very extraordinary that it should occur on living moths.—*E. Newman.*

W. Claxton.—Would you be kind enough to inform me whether it is necessary to remove the interior of beetles before placing them in the cabinet?

[I have never done anything of the kind. I place the drying-cage in the thorough draught, and do not find any inconvenience arise from the smell.—*E. Newman.*]

Haggerston Entomological Society.—The annual exhibition of this Society will be held in their room at the "Brownlow Arms," Brownlow Street, Haggerston, on the evenings of Thursday and Friday, November 12th and 13th, from 7 to 11 P.M. All entomological friends are invited to attend; and any entomologists wishing to exhibit will kindly send their exhibitions on or before Thursday evening, November 5th, to the Secretary, Mr. Bartlett, at the above address.

Death of Mr. Crotch.—George Robert Crotch, a Coleopterist of great eminence, and still greater promise, died at Philadelphia on the 16th of June of the present year, apparently in the very zenith of an undertaking, which—in

its ambitious programme, and the known zeal, perseverance, and energy, of its projector—perhaps has no equal in the annals of entomological Science. Mr. Crotch was the grandson of Dr. Crotch, so celebrated as a musical composer; the son of the Rev. Mr. Crotch, of Uphill House, Weston-super-Mare; and the brother of Dr. W. D. Crotch, who has attained a European celebrity by his labours in Natural History, more especially in Coleopterous insects, of which he discovered numerous new species,—forty-four in the Island of Canary alone,—as recorded by Mr. Wollaston in his 'Catalogue of the Coleopterous Insects of the Canaries,' published in 1864. Mr. G. R. Crotch was born in the year 1841, and very early exhibited the characteristics which so eminently distinguished him in after life: indefatigable industry in pursuit of a beloved Science, and perfect disregard of his own personal comfort, and even health. These attributes were so remarkable as to take the form of an eccentricity,—meat, drink, and rest, seemed to him matters of indifference: if night found him on what he considered good collecting ground, rather than leave it, with the intention of returning on the morrow, he has been known to lie down under the shelter of a hay-stack or sedge-stack in the fens, and there remain, until the return of daylight enabled him to resume his labours. This devotion to Entomology continued and increased, until it became the absorbing passion and occupation of his life. At first he seems to have given his attention more especially to British Lepidoptera; and his first contribution to entomological literature was on a butterfly, generally esteemed of rare or accidental occurrence, Thecla Betulæ, which he observed in great abundance flying round the tops of high trees in company with its congener T. Quercus. This was in 1856, and three years later he searched the fen districts of Cambridgeshire: here he discovered Leucania Elymi; and here, too, he gave the first instance of that perseverance, skill, and thoroughness, in collecting Coleoptera, which subsequently became his distinguishing characteristic.

In 1862 he published his first notice of ants'-nest beetles, and from that time he seems to have given no rest to his hands, to his pen, or to his mind.

In 1863 he published the first edition of 'Catalogue of

British Coleoptera,' a labour which at once exhibited him as a most careful and judicious compiler: yet he was never satisfied with this production, but was constantly finding something that required emendation and improvement, which he introduced in a second edition, published soon afterwards, but without date.

This appears the right place to introduce, in chronological order, a list of the papers sent to myself, during a period of fourteen years (1856—1870), for publication in the 'Zoologist' and 'Entomologist.' The list speaks for itself, and shows what an extensive range was covered by his researches. The papers themselves exhibit, at the same time, what has been been aptly termed, "a lynxian eye for specific differences," and a wonderful aptitude for expressing those differences in words,—a gift of excessive value, in proportion to the rarity of its occurrence.

In the 'Zoologist.'

1856. Extraordinary Abundance of Thecla Betulæ in Montgomeryshire, p. 5291.

1859. Is Micra parva Double-brooded? 6385.

1861. Leucania Elymi in England, 7717. Capture of Sphærius acaroides, Hydrochus carinatus, &c., in the Fens, 7724.

1862. Notice of Two Species of Coleoptera New to Britain, 8083. Coleoptera found in Company with Formica fuliginosa, 8139. Coleoptera in the New Forest, 8301.

1863. Cryptocephalus Wasastjernæ discovered in Britain, 8413. The British Species of Helophorus, 8610.

1864. On some New or Rare British Coleoptera, 8998. Addendum to the paper On some New or Rare British Coleoptera, 9057.

In the 'Entomologist.'

1864—5. Revision of the Genus Telephorus, as far as regards the British Species, vol. ii. p. 167. Phlœotrya rufipes, ii. 178. Latridius testaceus, Ceuthorhynchus inornatus, Monotoma 4-foveolata, ii. 179. Notes of the Genera Malthinus and Malthodes, ii. 181. Anisonyx fuscula, a Genus of Coleoptera New to Britain, ii. 189. Borboropora Saulcyi, a New British Coleopteron; Notes on certain Alterations of Nomenclature in the Genus Malachius; Notes on the Genus Telmatophilus, with Descriptions of a New British Species; Notes of some Species New to Britain, ii. 209 *et seq.* Notes on the Melyridæ, ii. 213. Extract from the Monograph on Gymnetron, by W. H. de Barneville (a translation), ii. 216. Remarks on Synonymy

of the Genus Dasytes, ii. 225. Remarks on the Genus Ceuthorhynchus and its Allies, ii. 259. Some remarks on the Genus Nothus of Olivier, ii. 261. Captures in Monk Wood, Huntingdonshire, ii. 268.

1866—7. Observations on the Genus Anaspis, iii. 31. Further Notes on the Telephoridæ, iii. 47. Notes on a Species of Homalidæ New to Britain, iii. 60. Observations on concluding portion of the Curculionidæ, iii. 63. Prior Appearance of Male of Female, iii. 67. Mould on Lepidoptera, iii. 72. Revision of the 'Catalogue of British Coleoptera,' iii. 105, 119, 133, 173.

1868—9. Notes on some Doubtful British Coleoptera, iv. 47. Notes on recent Continental Publications on Coleoptera, iv. 65. New Method of Preserving Coleoptera, iv. 229. Contributions to a Synopsis of British Coleoptera, iv. 307.

1870. Notes on British Coleoptera, v. 7.

In 1864 Mr. Crotch visited the Canary Islands, in company with his brother, the doctor, whose success there two years previously I have already mentioned. I find no separate record of the result of this most laborious journey; but the new species obtained, seventy-seven in number, have been described by Mr. Wollaston in the Appendix to his 'Coleoptera Atlantidum.' This year also he obtained an appointment as one of the assistant librarians in the Public Library at Cambridge, and received the degree of M.A. in Natural Science.

In 1865 he visited Spain in company with several French savans, and by their united exertions some of the finest collections of Spanish Lepidoptera were made in that country, of which previously to this visit little was known entomologically.

"In the year 1867 Mr. Crotch published, in the Proceedings of the Zoological Society of London, a complete enumeration of the Coleoptera of the Azores, accompanied by descriptions of new species found there by Messrs. Godman and Brewer. Although his collections had by this time become very considerable and required much of his time, Mr. Crotch pursued with untiring industry his studies of the literature of Entomology, and published, besides a large number of corrections of the Catalogue of Coleoptera of Gemminger and Von Harold, a list of all the Coleoptera of the group Adephaga, described from the year 1758—1821, referring them to their modern genera; this he did with the hope of assisting others who, like himself, were engaged in attempting to cleanse the Augean stable of entomological nomenclature. This work was published at Cambridge in 1871, and

by this time he was recognized by the best judges to be the man who had a more detailed acquaintance with the ancient literature of Entomology than any other living student. This paper had, indeed, been preceded by one published in the Transactions of the Entomological Society of London, intituled 'The Genera of Coleoptera studied Chronologically (1735—1801),' which was, and probably will long continue to be, of great use by pointing out to zoologists the great difficulties that encumber any attempt to deal in a systematic manner with entomological nomenclature. In 1871 he also published a synopsis containing abbreviated descriptions of all the new species of Coleoptera belonging to the European and Mediterranean faunas that had been described during the year 1868; this little production cost a vast amount of investigation; and it is much to be regretted that it has not been continued by some other student, as he hoped it would have been. By this time Mr. Crotch, whose enthusiasm for the study of Entomology seemed to take always wider and wider limits, had engaged himself in the investigation of the Coccinellidæ and Erotylidæ of the whole world."—'*Entomologist's Monthly Magazine*' *for August*, 1874.

In 1870 he visited Spain a second time, with a view of completing his own and other collections of the Coleoptera of that rich and interesting country, and a second time added enormously to our knowledge of its insect fauna.

He now seems to have turned his attention to the great object of his life, a coleopterous voyage round the world, and collecting in all countries of which the beetle population was little or imperfectly known: he embarked in this gigantic enterprise in 1872, and made rich collections in California, Vancouver's Island, Oregon, and other states of the union, thence returning across the continent of North America, arrived at Philadelphia, and there finished his laborious career.

In 1873 he completed his 'Check List of the Coleoptera of America, north of Mexico,' and it was published the same year at Salem, Mass., U.S., by the Naturalists' Agency. His last work was a 'Revision of the Coleopterous Family Coccinellidæ:' this is all printed, and I hope to obtain complete copies in a few days.

It may be stated as conclusive evidence of the high estimation in which his labours in the cause of Science were held, that on two occasions sums were granted by his University to assist in enabling him to persevere in the course he had chosen.—*Edward Newman.*

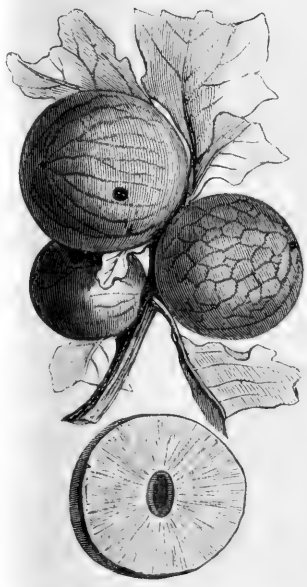
THE ENTOMOLOGIST.

No. 135.] NOVEMBER, MDCCCLXXIV. [PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

18. *Cynips Kollari.*—The gall of this species appears on the oaks in the same way as that of Cynips tinctoria, from which, in many instances, it cannot easily be distinguished. It is perfectly spherical, from twelve to twenty-three millemetres in diameter, of a brownish yellow colour,—rarely of a brownish red-yellow,—naked, smooth, and often without any unevennesses, but it has sometimes such isolated and minute warts as occur on the gall of Cynips tinctoria. The section exhibits a brownish yellow reticulation, consisting of thin-walled parenchyma and parenchyma-cells, so that the gall may be easily cut with a knife. No proper inner-gall, like that of Cynips tinctoria, is to be found, although the gall-substance surrounding the oval larva-cell in the centre of the gall is harder, and has a radiate-striated

Fig. 18.



CYNIPS KOLLARI (and in section).

appearance. When parasites develope themselves in the larva-cell we sometimes meet with a stronger and rather hard condensation of the gall-substance which surrounds the cells. The gall, green in summer, becomes yellowish in September, and is pierced by the imago towards the end of this month. Most of the parasites and inquilines, however, do not come forth till the following winter or spring. It adheres so firmly to the twigs that we often meet with galls two or three years old still attached to the twigs. Many of these galls may be mistaken for those of Cynips tinctoria, yet are to be distinguished by their brownish yellow colour and obscure reticulations on the surface, by the absence of any distinctly-pronounced interior gall, and by the earlier emergence of the perfect insect. The gall of Cynips tinctoria occurs in the southern half of Europe, though near Vienna it is no longer frequently met with; that of Cynips Kollari, however, is found as far as the German Ocean.—*G. L. Mayr.*

The occurrence in England of this gall, which has received the name of Devonshire gall,* has been a prolific source of entomological correspondence, and I may say of entomological literature. Probably many early records of such occurrences have escaped entomologists, from their being published in newspapers and other periodicals neither exclusively nor chiefly devoted to subjects in any way connected with Natural History. Entomologists who have read such sensational paragraphs on the subject of oak-galls, and the loss they are likely to bring on the farmers and landowners, may reasonably be excused for disregarding them, as we certainly do the "unparalleled phenomenon" of multitudes of winged-ants making their appearance at the end of August, or the "unprecedented event" of a "mosquito" (Culex pipiens) having attacked a slumbering traveller in the best bed-room of the best hotel in London. It is not that we call in question the existence of the galls, or of the winged-ants, or of the mosquito, or any of the concomitant circumstances: these are indisputable, but, like the historical gray horse one always meets on London Bridge, they are facts that make no impression on our visual organs, and

* Throughout this note I shall retain the name Lignicola for the Devonshire gall, although Dr. Mayr has given it to another species.

therefore none on our mental perceptions or memory. Such paragraphs form no part of gall-history, or ant-history, or gnat-history: for these we must investigate more methodical and more reliable sources of information. The authentic history of the Devonshire gall, as British, commenced on the 6th November, 1854, with Mr. Rich, who was present as a visitor at the meeting of the Entomological Society of London, and exhibited "some sprays of oak thickly covered with large galls. He observed that in Somersetshire, and in part of Gloucestershire, they were so abundant that the oaks were completely covered with them, to the extinction of the acorns,* the loss of which, for feeding their pigs, the farmers greatly regretted, although he believed that in the value of these galls they had more than an equivalent, seeing that the chemical properties of these galls were nearly equal to those of the Aleppo galls, imported for the manufacture of ink. Mr. Curtis said that Mr. Rich had given him an example of this gall, and that he had also recently received some similar galls, with a specimen of the fly, from his friend Mr. Walcott, of Bristol, who obtained them from an oak growing near the Hotwells, Clifton. Having paid great attention to the Cynipidæ, and bred most of those which are produced from oak-trees, he (Mr. Curtis) had often been doubtful respecting the true Cynips Quercus-petioli of Linneus; but he was convinced the specimen he now exhibited—which he had bred, with a few others, from the galls alluded to—is the Linnean species. Cynips Quercus-petioli is described by Linneus in his 'Fauna Suecica,' No. 1523, where he refers to Rœsel, who has given good figures of the galls, fly, &c. ('Insecten Belustigung,' iii. Sup. tab. 35 and 36). The flies are much larger than any other species which had been described as British, and are nearly allied to those produced from the galls of commerce, the Diplolepis Gallæ-tinctoriæ of Olivier. Mr. Stainton said that for the last four or five years he had noticed these galls in Devonshire, but not in such profusion as now stated. The President had some doubts whether this was the Cynips Quercus-petioli of Linneus, for

* At p. 155 of the fourth volume of the 'Entomologist,' Mr. Bignell states that he finds galls and acorns on the same tree, and offers to send a piece of oak with both on it. This scarcely militates against the fact that galls are *generally* produced where acorns do not grow.

the galls were situated in the axils of the leaf, and not on the petiole." (Proc. Ent. Soc. Lond.: reported Zool. 4567.) It is further reported, at p. 4571 of the 'Zoologist' (dated, December, 1854), that at the following meeting Mr. Jordan stated that he had known these galls for twenty years, and that a medical man at Lympstone, near Exmouth, "used them always to make his ink, and tried to impress upon the country people the use that might spring from making them an article, so to speak, of exportation." The pecuniary advantage of exporting these galls, at a time when we were importing the Aleppo galls for the very purpose of ink-making, does not seem very obvious. Still the project of utilizing the galls in the manufacture of ink was praiseworthy, but it was doomed to undergo a decided discouragement from the careful analysis of Dr. Hart Vinen (reported Zool. 5025), from which it appears that these galls contained but 17 per cent. of tannin, whereas the Aleppo galls, the well-known ink-gall of commerce, contained 56 per cent. "Dr. Vinen," commenting on this great disparity, "thinks it possibly in some degree attributable to the fact that whereas all the Aleppo galls were entire, those from Devonshire were all perforated by the Cynips in escaping: it was a well-known fact that a sample of the galls of commerce were depreciated in value by the presence of any that were perforated. Dr. Vinen, however, wished to call the attention of the Society (the Linnean) to the extraordinary discrepancy existing between the various published analyses of the Aleppo galls, which was greater even than that between his own analyses of the Devonshire and Aleppo galls: Sir Humphrey Davy's analysis yielded 26 per cent. of tannin; Pelour's, 40; Leconnet's, 60; Guibourt's, 65; Mohr's, 72; and Buchner's, 77." I assume that tannin is the element required in ink-manufacture, and, this being so, it is most desirable that experiments, for testing the amount of this element, should be made on galls in a precisely similar condition as to age and maturity. I am uncertain whether this vegetable dye is still a necessity in the manufacture of ink, or whether minerals have not superseded its use. Continuing the English history of this species, we find that at a meeting of the Entomological Society in February, 1855, Mr. Stainton read a letter on the subject, without giving the

name of his correspondent, which contained much valuable information; but, as it appeared, that letter was written by Mr. Parfitt, of Exeter, who has subsequently written me a more amplified paper for publication in the 'Zoologist.' I have preferred giving this further on, seeing it will be found to embrace all the points mentioned in the letter to Mr. Stainton, and others equally interesting. At a meeting of the Entomological Society, on the 5th November, 1855, Mr. Curtis read the following note from the late Mr. Haliday, who had collected a great number of these galls at Glanville's Wootton, the seat of the late Mr. Dale, in Dorsetshire:—"I cannot identify it with any Linnean or Fabrician species, but it is the Cynips Lignicola of Hartig, and the only one of that group to which the ink-gall belongs, that occurs so far north as England, or even Northern Germany." (Zool. 4964.) It should be stated in this place that, at p. 7 of the fourth volume of the 'Entomologist's Monthly Magazine,' the Rev. T. A. Marshall—who is indefatigable in the study of the British Cynipidæ, and in every respect competent to speak with authority on the subject—says that the Cynips Quercus-petioli of Linneus is a species of Synergus, and a parasite on Cynips Lignicola. I have no precise recollection of the date when this gall first became known to myself: the observations above quoted would seem to indicate its having been established in Britain at least half a century; but I cannot refer to any evidence of its non-existence here at an earlier period. The absence of a record is the only reason we can possibly assign for supposing the absence of the gall; and when we consider how very recently galls have been observed by us at all, and how very small is the number of observers even now, we must not lay too much stress on the silence of our predecessors. This gall certainly now forces itself into notice, and it does not appear thus to have intruded itself on the notice of our entomologists during the half century previous to that in which we are now living: this is, perhaps, in favour of its absence at an earlier date. Then with regard to its economical bearing on our country. The alarmists prophesied the speedy destruction of the oak,—a tree that is metaphorically considered the bulwark of British safety. Now I have yet to learn that it does any appreciable injury to the adult oak. Its effect upon the sapling, so often

mentioned, is observable; but even on these it is not very serious, and has never been carefully observed or accurately estimated. Many newspaper writers took up the cause of the pigs, who were supposed by Mr. Rich, in the passage I have cited, to be on the point of losing a favourite esculent through the agency of this gall; and the watchword sounded far and wide,—"Rally round the pig." "Stand by the pig" was the war-cry thoughout the West of England. The farmers girded themselves for the combat; but, alas, could not discover the enemy. Willing, aye, eager, to fight by the side of their favourite, his enemy was nowhere to be seen,—was too small to contend with; fighting was out of the question; the war-cry was abandoned, and the helpless wail arose from every Western press, "Pity the poor pig." And those entomologists who, like myself, are ever on the look-out for the protection of crops from insect-enemies, were continually appealed to, to recommend some powder or chemical that should be a remedy against the galls. But here I must introduce Mr. Parfitt's letter, which embraces the whole subject, and, I think, shows, amongst other things, that the remedy was not required. This accomplished naturalist begins by objecting to the statement that these galls were first brought into notice by Mr. Rich, and then proceeds, thus:—"I was the first to take particular notice of them. I sent some of the galls to Mr. Westwood as far back as 1848 or 1849, to ask the name of these excrescences. I sent to him through one of the gardening periodicals, and received from him the name of Quercus terminalis. This was stated in a letter I wrote to Mr. Stainton some moths ago, which was read at one of your meetings [meaning the meetings of the Entomological Society], and caused rather a sharp discussion. Mr. Westwood was present, but took no part in it; he no doubt considered that the name he had given was the correct one; but in this he was in error,* as the gall now appears to be the Cynips Lignicola of Hartig. Had it been new, or should a specific difference between our insect and Lignicola be hereafter

* Subsequently Mr. Westwood seems to have altered his opinion, for he is reported (Zool. 4708) to have said, at a meeting of the Entomological Society, on the 2nd April, 1855:—"I determined the specimens to be C. Quercus-petioli so long ago that the ink with which the name was written on the label has faded."

detected, I would suggest the name of Cynips Quercus-gemmæ,* as the parent insect deposits its eggs in the buds themselves, and the galls are produced at the expense of the buds. I do not see cause for such alarm as one would be led to suppose through reading an article in the 'Gardener's Chronicle' some short time since. It is true the insect is very injurious to the young trees in particular. In the two large nurseries in Exeter the young trees are sadly distorted, and they cannot make headway against the enemy; but once turn the galls into use, and they will disappear much faster than they have been produced. I before stated, in the letter read by Mr. Stainton, that it is rare to see the galls above ten feet from the ground, but the nearer the ground the thicker the galls, and on the little twigs lying on and just above the surface of the ground nearly every bud has been metamorphosed into a gall; as you ascend they gradually diminish in number, until the line may be drawn at ten feet, above which only a few stragglers can be found. The winter before this last the tomtits had found out the secret of what was in these galls, for they were never at a loss for a meal. When the ground was covered with snow I have seen numbers of the blue-headed titmouse† working away at the galls in search of the fine fat larvæ of the Cynips; and this winter the titmice appear to have been more destructive to the larvæ, for now in a short walk you may find hundreds, nay, thousands, that have been picked to pieces to get at the insect within.‡ Should these galls be turned to account for the manufacture of ink, being so near the ground they could be easily gathered by children, so that the cost would be very trifling. It is said by the writers in the 'Gardener's Chronicle' that the galls diminish the crop of acorns: now I cannot believe this, because, as I said before, it is uncommon to find them on

* This is the Linnean name for another species.

† In the 'Field' newspaper, September, 1871, Mr. H. B. Murray informs us that the galls in question "are opened by squirrels, and not by titmice, as stated by Mr. Parfitt;" adding:—"I have myself seen the ground under the oak-trees strewn with the fragments of these galls, and there could be no doubt of squirrels being the operators, as they were seen in the act." I have no ground for differing from Mr. Murray as to squirrels; but I entirely agree with Mr. Parfitt as to titmice: I have seen titmice of the species Cæruleus, Ater, and Palustris, engaged on them.

‡ I have written rather a long paper on this subject—"Titmice and Galls"—in the 'Field' newspaper.

large trees, and it is well known that it is only the large—I may call them mature—trees that produce acorns, so the injury done to them cannot be great. As regards the species of this Cynips it is certainly not the C. Quercus-folii of Linneus; though the figure of the perfect insect, given by J. Ræmur in the 'Genera Insectorum Linnei et Fabricii,' agrees pretty well, the description does not agree at all with our insect." (Zool. 5074.)

There is a phase of the subject which would demand a detailed investigation here, had I not so recently urged my views on the readers both of the 'Entomologist' (vol. vi. p. 275) and 'Field' newspaper. There is a constant struggle going on between the oak and the Cynips, the aim of the oak being to reproduce its kind by seed, the aim of the Cynips to utilize the oak as a nidus and a provision for its progeny; but oak-timber or oak-leaf in a normal, natural or healthy state, is not precisely the provision that the infant gall-fly would require, so the parent punctures the oak, its rind, or its leaf, or its leaf-stalk, or its flower, and injects a sap-poison, which totally alters the condition and qualities of the sap: this in sufficient abundance would kill the oak; but when we glance at the comparative magnitude of the oak and its enemy, we see that such a result is improbable; still the effect is deleterious: the oak struggles against it, and strives to perfect its normal produce; the Cynips also struggles to maintain its ground: each holds its own, and neither, during its brief historical existence, has gained any advantage over the other; and so the contest ends in a compromise. These galls are not acorns, as the oak would have willed that they should be, but are the nearest approach to acorns that the oak can produce* under its affliction. I have examined hundreds, perhaps thousands, of these objects during the past and present autumns, and invariably with the same result. The gall consists of two parts,—the larger is spherical, the smaller

* Mr. Inchbald, in the 'Field' newspaper, strenuously opposed the doctrine (first introduced to public notice by the editor of that newspaper), that these galls are produced at the expense of the acorns. In a subsequent paper, reprinted in the sixth volume of the 'Entomologist,' p. 338, Mr. Parfitt expresses an opinion opposed to that of Mr. Inchbald, and argues that the solution there suggested is the correct one: Mr. Parfitt's reply is logical, and extremely well argued. Of course I cannot reprint a paper so recently published in this journal.

saucer-shaped and situated beneath the larger, and between this and the twig to which it is attached; the spherical body represents the carpel of the acorn, or the acorn proper, and the saucer-shaped cushion, on which it rests, represents the cupule or cup, or calyx. Having ventured to call the entire gall a pseudo-balanus, or false acorn, so will I call the spherical portion the "pseudo-carpel," and the cushion the "pseudo-calyx." On carefully examining the pseudo-carpel—projecting from it exacly opposite the point of attachment, and therefore on its summit—will be found a small pointed process, which represents the persistent stigma of the acorn; and the exterior covering of the pseudo-carpel—tough, leathery, and smooth—represents the pericarp of the acorn. I fail to discover, either on the real or false acorn, the markings so clearly expressed in Dr. Mayr's figure. The resemblance or mimicry of the true cupule by the false one is not very evident; the relative magnitude of acorn and cup are very different, but the composition is the same. If I understand that of the true acorn correctly, it is made up of a number of involucral scales or bracts, soldered, anchylosed, and compressed together into a cupular form; and this I believe to be equally the explanation of the mimetic cupule. As in the true acorn, a vertical section will bisect the stigma, the carpel, and the cupule, showing that there is the same method in the arrangement of the parts of the false and true acorns. Until a year or more has elapsed I can find no tendency to dehiscence at the base of the pseudo-carpel, but during the second year I have repeatedly observed this dehiscence, the pseudo-carpel falling to the ground like an acorn, and exhibiting a cicatrix at its base, while the cushion, cupule or pseudo-calyx, retains its adhesion to the twig. This is also the case with the Aleppo galls, Cynips gallæ-tinctoriæ, which dehisce and fall in numbers every autumn.

This is emphatically the species on which the most careful observations have been made, with a view to settle the doubtful point, whether or not the species is continued from year to year by a succession of females only, or whether males do exist in alternate generations or in some undiscovered form. The latter seems the more reasonable conjecture, and I think was first promulgated by the late Mr. Walsh, at p. 320 of the second volume of the 'American

Entomologist,' as already incidentally noticed in this journal. More recently Mr. H. F. Bassett—a most careful observer—states, at p. 91 of the fifth volume of the 'Canadian Entomologist,' that "Cynips quercus-operator, an American species, is double-brooded, one brood of females ovipositing in the buds of the oak, and again some of a second brood ovipositing in the young acorns of Quercus ilicifolia. From these and other facts he infers that all the American species, that are found only in the female sex, are represented in another generation by both sexes, and that the two broods are, owing to seasonal differences, produced from galls that are entirely distinct from each other." Whether this is only an ingenious conjecture, or an absolute discovery, I am unable to say; if the latter it may (in the hands of such painstaking men as Mr. Inchbald, Mr. Smith, Mr. Parfitt, Mr. Marshall, and Mr. Fitch) supply a clew to the eventual discovery of the males of Cynips Lignicola. In the meantime the weight of evidence is thrown into the other scale. I know not when or where the statement originated, but I find myself in 1835, in the 'Grammar of Entomology,' describing the female Cynips (p. 210), as though a male had never been seen or thought of; and again, in my little pamphlet on the 'Physiological Classification of Animals,' I have plainly stated that no male is known. In 1861 Mr. F. Smith, of the British Museum, sent me a paper on the subject, which, so far as negative evidence can go, seems completely to decide the question as to the non-existence of a male in Cynips Lignicola. I will cite portions of this paper:—"In the year 1857 I felt desirous of satisfying myself as far as possible, by my own observations, of the truth of the opinion at that time put forth by more than one eminent entomologist, that in the genus Cynips there is only one form of sex; in other words, that in the genus Cynips there is *no male*. In order to carry out my experiments I obtained from Devonshire a large supply of the galls of C. Lignicola, somewhere about a bushel and a half: every gall was tenanted by the Cynips or its parasite, Callimome Devoniensis. About the beginning of April, 1858, the Cynips began to issue from the galls, and continued to do so up to the end of May, at which time I could not have obtained less than twelve thousand examples, and many hundreds of its parasite. By examining the galls daily during the progress

of the development of the flies, I was enabled to examine the whole of the latter, and to satisfy myself that all of this immense number were females. I also placed about sixty galls in as many separate boxes, and when the Cynips came out I carried them to different localities in the vicinity of London, placing them upon low oaks in woods and hedges. In the month of August I revisited the various localities, and in about eight cases out of twelve I found galls upon the very trees on which I had placed the Cynips, but on none in their vicinity. From these galls I again obtained Cynips, and this brood I also placed in isolated situations; and again I found galls formed in about the same proportion as in the previous instance. In neither of these cases could there have been any connection with the male sex, unless that sex be of microscopic dimensions." (Zool. 7332.) And again:—"Every observation which has been made on the genus Cynips is against the possibility of the existence of an active male: it is proved that females, which could not have been fertilized by copulation, deposit eggs which are fruitful." (Zool. 7332.) Mr. Smith then quotes Léon Dufour, who reared Cynips by thousands from different species of galls without discovering a male; and Hartig, who obtained twenty-eight species of Cynips, all females, from different kinds of galls; in one case that of Cynips divisa, at least ten thousand females, and about four thousand of Cynips Folii. Hartig has also observed "the female Cynips issue from the gall, and immediately proceed to deposit her eggs." To this Mr. Smith says:—"I may also add that during the past autumn I have bred numbers of Cynips Folii from the cherry-gall of the oak-leaf, all being females;" and he concludes in these words:—"In fact, all observation is opposed to the existence of an active male in the genus Cynips."

I was expecting Mr. Walker's notes on the parasites of Cynips Lignicola, when the mournful intelligence reached me that his labours were ended, and his observations had ceased for ever. I have thus lost the most able of coadjutors.

I copy two notes, which have already appeared in the 'Entomologist,' because containing all the information I have at hand respecting the parasites of the Devonshire gall. The first is by Mr. Walker:—

"*Note on Cynips Lignicola.*—Two supposed parasites, a Callimome and a Decatoma, have long been recorded as inhabiting the Devonshire gall. I have lately received from Mr. Newman two other species reared from these galls. They have not yet been recorded as British, and may be new species. One is a Eurytoma; the other, a Callimome, has also been reared by Mr. Fitch.—*Francis Walker.*" (Entom. vi. 101.)

The second note is by Mr. Fitch:—

"*Additional Parasites of Cynips Lignicola.*—I have lately bred seven different species of parasites—not including the well-known Callimome Devoniensis of Parfitt and Decatoma—from some dwarfed specimens of C. Lignicola, which I collected at Burnham, Essex, last February. Mr. Walker has kindly examined the insects, and finds some new to Britain, if not altogether new species. The insects are—*First*, ten specimens of Ormyrus punctiger; emerged from 18th June to 29th July. *Second*, one male Eurytoma (n.s.?); emerged 18th April. *Third*, one Pteromalus; emerged 13th May. *Fourth*, numerous specimens of a Callimome, nearly allied to C. inconstans; emerged between 28th April and 20th June. *Fifth*, several females and one male of Callimome, n.s.; emerged between 3rd and 17th April. *Sixth*, nine specimens of a small black Hymenopteron, quite unknown to Mr. Walker,—seven females and two males; emerged from middle to end of March. *Seventh*, one specimen; emerged 25th June; returned by Mr. Walker as n.g., allied to Entedon. All these were bred from a small cluster of galls on a single twig.—*Edward A. Fitch.*" (Entom. vi. 243.)—*Edward Newman.*

Life-histories of Sawflies. Translated from the Dutch of M. S. C. Snellen van Vollenhoven. By J. W. May, Esq.

(Continued from vol. vi. p. 134.)

Nematus latipes, *Villaret.*

Imago: Foulques de Villaret, Mémoire sur quatre nouvelles espèces de Tenthrédines, dans les Ann. de la Soc. Ent. tome i. p. 303, pl. xi., figs. 4—6; *Hartig, Blatt-und Holzwespen*, p. 185, No. 3.

Larva undescribed.

Nematus niger, palpis pallidis, abdominis medio et femorum posticorum parte inferiori rufis, tarsorum posticorum articulo primo dilatato.

Two species of Nematus, having the first joint of the posterior tarsi dilated, have already been described in this journal, namely, Septentrionalis, *L.*, in the second volume, and Varus, *De Villar.*, in the sixth, and I had no expectation of being able to add a third species, as I regarded the two others, mentioned by Villaret, as restricted to the south of Europe. When I first saw the imago of this new species, running about in a confectioner's glass, in which some Nematus larvæ had been placed, I thought that a larva of Septentrionalis, which also lives on the birch, had, by some mistake, got among them; but I soon saw, to my delight, that I had before me a species with which I was hitherto unacquainted in the free state. I am again indebted for this discovery to the kindness of Mr. de Roo van Westmaas. I had, indeed, myself met with the larva in the wood near Zeist, and had taken it home and made a drawing of it, but I had failed in rearing it. Afterwards, in 1861, I received some larvæ from my friend De Roo, with which I was equally unfortunate; but at the end of September, last year, he sent me a large number of larvæ, which I at last succeeded in rearing, so that I have both sexes of the imago. I am, however, still unacquainted with the egg. The youngest larvæ which I saw had the appearance represented at fig. 1, pl. 8,—very dark brown, almost black, with shining brown head and yellow legs. In my earliest notes on this species (written at least twenty-two years ago) I make the observation that the smallest larvæ were entirely shining dark brown, with yellow anal legs or claspers, and that the yellow colour of the anterior and intermediate legs was only acquired after the larvæ had moulted on the 29th of August. The nearly full-grown larvæ are of the size and appearance of figs. 2 and 3. The head was depressed anteriorly, shining, of a dark brown colour, approaching black, and covered with very short gray hairs; the parts of the mouth were yellow. The four anterior abdominal segments yellow underneath; the body strongly wrinkled, black, with a shade of brown; the

margin of the anterior segment and the borders of the spiracles yellowish. The thoracic legs were yellow, with brown claws, and had a black mark on the last joint. The folds at the side were slightly hirsute. There were six pairs of abdominal legs, yellow, with a small transverse black line on the outside. The anal valve was brownish black, having a small spine on either side (fig. 4). Lastly, the ventral surface of the last segment and the two anal legs were deep yellow. These larvæ, which fed on the birch, were of a restless nature, frequently raising the abdomen and curving it over the back, in which position they would remain for some time. Hardly had the colony returned to a state of rest, and each individual assumed a natural position, when one of the number became restless, and commenced waving about from side to side, its example being followed by all the others, and some time elapsed before there was another pause. In their restless habit, as well as in their gregarious mode of living, they more nearly resembled Septentrionalis than Varus. On the apodal 4th segment, and on the 5th and 6th, between the legs, were greenish gray dermal processes, which could be reverted like the horns of the snail: these organs (fig. 5), which could be protruded to three times the length of the legs, were open at the extremity, whence a viscid and fetid fluid could be ejected. We have already observed similar glandular openings in nearly allied species.

In the beginning of October the larvæ took to the earth, and buried themselves as deeply as they could in the jar: the cocoon, which was single, was black and tough, very smooth within, and rough exteriorly, and curled up; in these the larvæ passed the winter. They passed into the pupa state at the end of April, being probably at first white and afterwards coloured. On the 5th of May of this year I found one which had already acquired its full colouring; of this I made a drawing (fig. 7), which calls for no special remark, excepting that the insect in question had so nearly reached the time for shedding the thin pupal membrane that the antennæ were no longer lying along in front of or between the legs, but were being moved about; in fact, the first imago, a female, appeared on the 4th of May, and was soon followed by others; a male appeared later. The female (fig. 8) had the head, thorax and antennæ black; palpi gray; cenchri white;

the abdomen was shining red, with the exception of the 1st segment, the sides and ventral surface of the 7th and the whole of the 8th, including the anal processes,—all which parts were black. The anterior legs were black nearly as far as the knee; further, obscure reddish gray, becoming of a darker tint to the claws; both the following pairs were black as far as the knee, then followed a white band, the remainder being brown or nearly blackish; the coxæ of the last pair were black, the extreme point, together with the apophyses, being white; femora shining black above, bright red on the under side; tibiæ black, with a white band at the base, finely hirsute, flat, and dilated towards the extremity, having long black spines with red tips; tarsi black, the first joint broad and flattened, and somewhat hairy; wings transparent, with a little faint smoke-coloured band on the upper wings past the stigma, which is dark brown, and over the tip of the under wings. Length, nine millemetres; expanding seventeen millemetres.

The male, in addition to the usual sexual characteristics, differed in the colour of the antennæ, the first two joints of which are black, the seven remaining joints being dark brown above and pale brown on the under side; and this sex also differed in having the apex of the abdomen entirely red, or at least brownish red. The intermediate legs are also paler in colour, and on the middle of the posterior tibiæ a red glow is perceptible between the white and black portions. Figures 9 and 10 are intended to show these points of difference; the first represents the ventral surface of the abdomen of the male, with the second and posterior pair of legs; and the other, the under surface of the left antenna.

It is highly probable that this species has more than one brood in the year. It has only hitherto been observed in the provinces of Utrecht and Gelderland.

Description of a Eupithecia New to Science; together with Notes on its Life-history. By C. S. Gregson, Esq.

Eupithecia Knautiata.—Expands ten to eleven lines. Head, thorax, abdomen, and fore wings, deep rich cold-brown; without striæ. On the costa there are three or four

darker brown markings, and below the two outer marks a large, dark, oval spot, placed rather high up, beyond which is a very faint indication (often invisible) of a whitish spotted line, terminated by a twin-spot near the anal angle, and edged with dark brown; wing-rays dark and well defined; abdomen smooth; hind wings large, dark cold-brown, having a marginal line of long dark streaks, terminated with a distinct light anal spot.

Larva:—Form, when young, slender, cylindrical; when older, rather stout, attenuated to both extremities, much appressed in the central segments, and somewhat rugose. Colour, from French-white, pale straw-colour, ashy gray, to light pea-greens and faint purplish peachy browns, and dirty dim colours of various shades. With numerous specimens before me, no two are alike, but shade away in every direction from the above colours: a pale pea-green ground predominates, dark ashy grays are plentiful, and a few with light purplish pink grounds may be seen, while in some the ground colour is reddish brown of various shades; altogether they are not elegant or attractive in their variations, and only a few of the varieties could be called pretty. Size, three-fourths to seven-eighths of an inch. Head horn-like, very small, ornamented with various marks and shadings; corslet small and dull, distinctly striate. On the central segment there is a well-defined, spade-shaped dark mark, pointing forwards, through which the light dorsal streak is often conspicuous; this mark appears as a broad-arrow head, in some positions edged with a light, rough, raised line, which passes down slantingly to the spiracular region through the subdorsal line, which is often well defined. In this species the central markings are lost on the anterior and anal segments, merging into the ground colour, as they usually do in other closely-allied species of this group of the genus Eupithecia, as at present constituted. Spiracular line wavy and well defined; spiracles dark, with a distinct light ring round each; under side light, and generally inclined to ashy green; feet light, horn-like. General appearance rather coarse, rough, and somewhat hairy. Not so stout as the larvæ of E. absynthiata or Minutata, and larger than the heath-feeder relatively. Whilst some remind you of Expallidata larvæ, others recall those of Succenturiata; but we see the subdorsal line in

Knautiata larva distinctly, whilst we fail to find it in its allies.

Some of our "quid nuncs," without seeing its larva, set it down as E. absynthiata, whilst others go in for its being Minutata; but, with considerable experience of this genus, both in the larval and imago state, I am quite sure it is not the former; and from its larval differentiation and larger size, distinctly different, and darker colour and habit in the perfect insect, we can hardly construe it into the latter well-known heath-feeder. I therefore propose the specific name of Knautiata for it.

The insect was first bred from the flower and seed of Knautia arvensis by Mr. Porter, of Bolton, who discovered it feeding in October, a few years ago, and who not only supplied me copiously with it in its early state, but directed me to his localities, where I took its larva freely on the 19th of September, and again on the 27th, full fed. It feeds on the flowers and seeds of the Knautia arvensis, which grows in profusion on the banks of Ball Hill Lodges, near Bolton, burrowing down into the flower and seed, until only one-half of the larva is visible: it turns to a large, light, rich, golden brown pupa. I may say, *en passant*, that I have fed a few of these larvæ from the young state on heath-flowers, to see if I could make them assume the beautiful pink colours of E. minutata; but my experiment has failed.

C. S. Gregson.

September 30, 1874.

Entomological Notes, Captures, &c.

"*Do Hornets ever Build in the Ground?*"—This question is asked by Mr. Henry Reeks in the last number of the 'Entomologist' (Entom. vii. 232). I can, from personal observation, assure him that they do so. In the month of August, 1871, I found a hornet's-nest in a bank at a wood side, near Sidmouth: it was at the latter part of the month, when the colony was numerous. I stood within two yards of the entrance to the nest for some time, the hornets passing in and out, but exhibiting no dislike to my close observation: I was anxious to ascertain whether hornets posted a sentinel within the mouth of the burrow; I failed, however, to detect one. In the fifth volume of the 'Entomological Magazine' (p. 479)

will be found a record of the hornet building in a perpendicular bank at the side of a river. Mr. Reeks' observations on "Our Common Wasps," in some particulars, do not accord with the results of my own observations and experience. Their number is said to be four; this applies, I conclude, to the species found in the neighbourhood of Thruxton. In the northern counties, and also in Scotland, their number would be five, Vespa norvegica being much more common than V. sylvestris. Of V. rufa, Mr. Reeks observes that he he has found it working until very late in the autumn, even to the beginning of November. This is a circumstance quite unknown to me previously. In all the nests that I have watched, the wasps have concluded their labours by the latter part of August, and I do not remember ever to have met with V. rufa later than the end of that month. My observations on V. vulgaris differ widely from those of Mr. Reeks, who says, "The males and workers are never seen after August." This will not apply to the neighbourhood of London, where I have seen both these sexes plentiful up to the end of September, and workers I saw on the wing ten days ago, near Highgate. On the 29th of September last, being in Yorkshire, I saw both males and workers in plenty, feeding on ripe pears, to the great disgust of a reverend friend of mine. V. germanica was equally common. Mr. Reeks, no doubt, is thoroughly well acquainted with all the sexes of the four species common in his own neighbourhood, but I have considerable doubts of anyone being able to separate the males correctly of the two commonest species, V. vulgaris and V. germanica, without an examination of the sexual organs; colour or markings, I am certain, from long experience, will not enable anyone to do so, and the workers of those species are also extremely difficult to separate: if whole colonies are examined, it will be found that the markings on the face are by no means constant. I have endeavoured to point out what I consider to be the best guides, in my work on the 'Fossores and Vespidæ,' published by the Trustees of the British Museum. The females of all the species are readily distinguished, as are also all the sexes of V. rufa, V. sylvestris, and V. norvegica. I never met with the male of V. arborea, but have received what I believe to be it from Northumberland and Carlisle: this species is very like V. rufa, but is rather larger, and also is a stouter insect, the legs being thicker,

and the entire insect much more pubescent.—*Frederick Smith; 27, Richmond Crescent, Islington.*

Deiopeia pulchella in Hampshire.—I took two very good D. pulchella a few days ago, but have not been able to get any more.—*George Gulliver; Brockenhurst, near Lymington, Hants, October* 18, 1874.

Deiopeia pulchella near Christchurch.—I have much pleasure in recording the capture of a fine male D. pulchella, by myself, on the 1st October, 1874, near Christchurch.—[*Rev.*] *A. C. Hervey; Pokesdown, Bournemouth.*

Deiopeia pulchella in Cornwall.—The D. pulchella I sent you a fortnight since was captured on the 26th September last, in the same field in which they were found three years since. Mr. Hearle took two in the same field on the preceding day. Having heard of his captures I went the following day, which was a bright, sunny, and very hot one, and had given up all hopes of finding any, when I saw coming towards me what I supposed to be a white butterfly, but on its near approach found it to be D. pulchella, when I gave chase, and after a long run succeeded in boxing it. I have searched the same locality many times since, but have not seen any more. Precisely similar captures were made in the same field three years ago, Mr. H. taking two on September 13th, and the following day I took one, but saw none after that, although none were taken during the intervening years. I think we may now look on it as having become established there.—*Stephen Clogg; East Looe.*

Deiopeia pulchella near Hastings.—On Monday morning last (September 28th) I caught a specimen of D. pulchella on the East Cliff, Hastings: the insect had a good flight. I identified it by a specimen belonging to Mr. Gardner, of 52, High Holborn. As the moth is scarce, and September an unusual time for its appearance, I thought the capture worth noting.—*Constance Garlick; 33, Great James Street, W.C. September* 30, 1874.

Deiopeia pulchella at Brighton.—As Mr. Newman, in his 'Natural History of British Moths,' gives July as the month for Deiopeia pulchella, it may interest some of your readers to know that I took a specimen on a low wall on the 5th of October, at Brighton, at nine o'clock in the morning.—*C. Hamlin; 14, Windsor Terrace, Preston, Brighton, October* 26, 1874.

Emmelesia unifasciata, Haw.—In September, 1872, my friend Mr. F. O. Standish kindly sent me a number of larvæ of this species. I put them into a pan which had silver sand at the bottom about three inches deep, and fed them with the seed-vessels of the red eyebright (Euphrasia Odontites). In August, 1873, about a dozen moths appeared, and in August this year three or four more. A few days since I examined all the cocoons, and found thirty-seven living pupæ. Of course no more of the perfect insects will emerge till August next year, and it is impossible to say how long some of them may remain in the pupa state. I believe this uncertainty of the time in which many species of Lepidoptera remain in the pupa state will, in a great measure, account for the abundance of certain species in some years, and their scarcity in others. —*Henry Doubleday; Epping, October* 12, 1874.

Sterrha sacraria, Xylina conformis, &c., near Neath.—The following captures may be interesting to you:—In the spring of this year Xylina conformis and Brephos Parthenias, near to our locality; and in the autumn several specimens of Plusia Festucæ, a fine variety of Agrotis saucia, several specimens of Epunda nigra, one of Sterrha sacraria, and one of Hoporina croceago.—*John T. D. Llewelyn; Ynisygerwn, Neath, October* 17, 1874.

Death of Mr. Walker.—It has become my painful duty to record that Francis Walker, the most voluminous and most industrious writer on Entomology this country has ever produced, expired at his residence, Elm Hall, Wanstead, on the 5th of October, 1874, sincerely lamented by all who enjoyed the pleasure and advantage of his friendship. He was the seventh son, and the tenth and youngest child, of Mr. John Walker, a gentleman of independent fortune, residing at Arno's Grove, Southgate, where the subject of this memoir was born on the 31st of July, 1809. Mr. Walker —the father—had a decided taste for science, especially Natural History: he was a fellow of the Royal and Horticultural Societies, and vice-president of the Linnean, so that his son's almost boyish propensity for studies, in which he afterwards became so eminent, seems to have been inherited rather than acquired.

Mr. Walker's decided talent for observing noteworthy facts

in Entomology was first exhibited at home, when, as a mere child, his attention was attracted by the butterflies, which, in the fruit season, came to feed on the ripe plums and apricots in his father's gardens: Vanessa C-Album is especially mentioned; and Limenitis Sibylla, another species no longer found in the vicinity of London, was then common at Southgate.

In 1816 Mr. Walker's parents were staying with their family at Geneva, then the centre of a literary *côterie*, in which they met, among other celebrities, Lord Byron, Madame de Stael, and the naturalists De Saussure and Vernet. They spent more than a year at Geneva and Vevey, and in 1818 proceeded to Lucerne, from which place Francis, then a boy nine years of age, made the ascent of Mont Pilatus, in company with his elder brother Henry; their object, in addition to the ever-delightful one of mountain-climbing, being the collecting of butterflies. The family afterwards visited Neuwied, and returned to Arno's Grove in 1820.

In 1830 the two brothers, Henry and Francis, again visited the Continent, and now it was purely an entomological tour, the late Mr. Curtis, the well-known author of 'British Entomology,' being their companion. This party collected most assiduously in the island of Jersey, and afterwards at Fontainebleau, Montpellier, Lyons, Nantes, Vaucluse, &c., the French Satyridæ, of which they formed very fine collections, being their principal object.

Mr. Walker's career as an author commenced in 1832. He contributed, to the first number of the 'Entomological Magazine,' the introductory chapter of his 'Monographia Chalciditum,' a work on the minute parasitic Hymenoptera,—a tribe of insects which he ever afterwards studied with the most assiduous attention, and one on which he immediately became the leading authority. He was then only twenty-three years of age; but his writings exhibited a depth of research and maturity of judgment which have rarely been excelled, and which abundantly evince the time and talent he had already devoted to these insects. It is worthy of notice that he now descended from the largest and most showy to the smallest and least conspicuous of insects, doubtless feeling that whereas among the magnificent butterflies there was little opportunity for the discovery of novelties, among the Chalcidites everything was new,—everything

required that minute, patient, and laborious investigation, in which he seemed so especially to delight. Only two authors, Dalman and Spinola, had preceded him in devoting their attention to the structure of these atoms of creation; and even these two had described comparatively a very small number of species.

In 1834 Mr. Walker, somewhat reluctantly, consented to undertake the editorial management of the 'Entomological Magazine,' and resigned this office the following year, yet continued a constant contributor to its pages. The same year he visited Lapland, in company with two of our most distinguished botanists; and in this extreme north of Europe, and especially at Alten and Hammerfest, he assiduously collected insects, more particularly the northern Diptera, the Satyridæ among Lepidoptera, and the Chalcididæ amongst Hymenoptera. During this journey we have the first and only notice of his prowess as a sportsman: he shot willow grouse and ptarmigan; and on one solitary occasion was accessory to the death of a reindeer; but as other rifles besides his own were simultaneously discharged, it is difficult to say whose was the effective bullet. I am glad to be able to record that Mr. Walker declined to give the poor creature the *coup de grâce*, and, for this especial purpose, resigned to another his *couteau de chasse*.

In May, 1840, he married Mary Elizabeth, the eldest daughter of Mr. Ford, of Ellell Hall, near Lancaster, and spent the summer on the Continent, again collecting in Switzerland with his customary assiduity.

In 1848 he explored the Isle of Thanet, the following year the Isle of Wight, and succeeding years, 1850 and 1851, he visited Geneva and Interlachen; and during the former year commenced his great work on Diptera. This formed part of a projected series of works on British insects, to be called 'Insecta Britannica,' a project in which the late Mr. Spence took a deep interest.

During the year 1851 was published the first volume of the 'Diptera.' This work is printed in 8vo, and contained 314 pages; the second volume appeared in 1853, and contained 298 pages; and the third volume in 1856, and contained 352 pages. Thus the entire work comprised nearly 1000 pages of closely-printed descriptions.

Another tour on the continent occupied a considerable

portion of 1857; Mr. Walker visiting Calais, Rouen, Paris, Strasbourg, Baden-Baden, Heidelberg, Wiesbaden, Frankfort, Mayence, Cologne, Brussels, Aix-la-Chapelle, and Antwerp. During the journey he collected in the Black Forest; and this is the only scene of his scientific labours, during the tour, of which I have any intelligence.

The summer of 1860 was devoted to a thorough exploration of the Channel Islands. Dr. Bowerbank was his companion during a portion of the time; and, as a consequence, the sponges of these islands, were a main object of research,—the Gouliot caves in Sark, so celebrated for their marine productions,—were a great attraction to both naturalists.

In 1861 Mr. Walker's excursions were chiefly confined to North Devon; he visited Linton, Clovelly, Ilfracombe, Bideford, and Barnstaple: and now his attention seems to have been again chiefly occupied with Lepidoptera, at the scarcity of which he was greatly disappointed, having expected, from the extensive woods, to have found moths particularly abundant.

In 1863 he toured the English lakes; and, in the spring of 1865, North Wales and Ireland; and in the autumn he again visited Paris, Geneva, Lucerne, Interlachen, and Altdorf, ascending the Righi, Mont Pilatus and the Mürren, and proceeding to Kandersteg, the Oeschinen See, and the Gemmi Pass.

In 1867 we find him again in France and Switzerland, ascending the Col de Voza, and examining the Jardin of the Mer de Glace; thence over the Tête Noir to Martigny, Sion, and the Great St. Bernard; returning by St. Maurice and the Villeneuve to Geneva.

In 1869 he made the tour of the Isle of Man, and returned by Holyhead; in 1870 he paid another visit to Llanberis, as well as to all the more beautiful scenery in North Wales, crossing over to Ireland, and touring that island from south to north; and in 1871 he examined entomologically the Scilly Islands, and the districts of the Lizard and the Land's End.

In 1872 he turned his attention to Italy, visiting Rome, Pisa, Lucca, Florence, Naples, Sorrento, Capri, Milan, and Venice, as well as the Lakes of Como and Maggiore.

And, finally, in the present year, he had again proceeded as far as Aberystwith, on his way to Ireland, when his intention was frustrated by illness, which terminated fatally

on the 5th of October. He died in the most perfect peace of body and of mind. For many years Mr. Walker was a member of the Linnean and Entomological Societies of London, but resigned his membership in both some time before the close of his life.

It might be excusable in a man of such incessant bodily activity,—so locomotive by inclination, so devoted to the study of Nature in all her aspects, so diligent a collector of the objects of his favourite study,—had he allowed his pen to rest while his hands were engaged in forming and arranging his collections. But this was not the case with Mr. Walker, as his Catalogues of the National Collection abundantly testify. Of the Lepidoptera Heterocera, alone, Mr. Walker catalogued and described upwards of twenty-three thousand species; in addition to which he prepared similar catalogues, although perhaps not to the same extent, of the Diptera, Orthoptera, Homoptera, Neuroptera, and part of the Hymenoptera: such an amount of labour, as is testified by these catalogues, has seldom, if ever, been accomplished by one individual. But this statement by no means represents the whole of his literary labours. He contributed shorter or longer papers to the Transactions of learned societies, and to the periodicals of the day, especially to the 'Zoologist' and 'Entomologist;' by the indexes of the latter I find he sent thirteen communications to the first volume, three to the second, one to the fourth, thirteen to the fifth, and forty-three to the sixth; during the present year his writings appear in every number. I intended to catalogue these, and his other labours, to give some idea of the number of pages, number of species, and dates of each; but I can scarcely now venture to look forward to the accomplishment of this labour of love.

A word remains to be spoken of the man apart from the scientific and accomplished naturalist. Throughout my long life I have never met with anyone who possessed more correct, more diversified, or more general information, or who imparted that information to others with greater readiness and kindness; I have never met with anyone more unassuming, more utterly unselfish, more uniformly kind and considerate to all with whom he came in contact. It is no ordinary happiness to have enjoyed the friendship of such a man for nearly half a century.—*Edward Newman.*

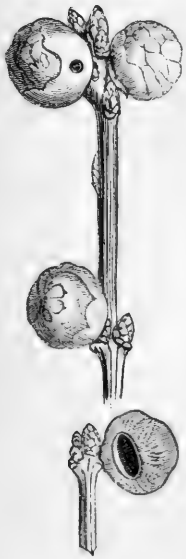
THE ENTOMOLOGIST.

Nos. 136 & 137.] DECEMBER, MDCCCLXXIV. [PRICE 1s.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER *née* WEISE.

19. *Cynips Lignicola.*—This gall, which is extremely abundant in Austria and Hungary, is usually developed from the axillary buds of Quercus sessiliflora and Q. pedunculata, and sometimes, although less frequently, from terminal buds also. It is generally rather larger than a pea, measuring more than a centimetre in diameter; but we have occasionally met with specimens no more than five millemetres in diameter. It is of a spherical form, and usually of a ferruginous-red colour, less commonly brown-yellow or blackish red-brown: it is enclosed in a hoary encasement, which, however, is wanting in some parts, having been ruptured by the enlargement of the gall. In other specimens, especially larger ones, portions only of this hoary encasement remain at the base of the gall, in which case certain markings, usually concealed beneath the margin of the encasement, become visible. The interior of the gall consists of a tolerably hard, rust-coloured substance or

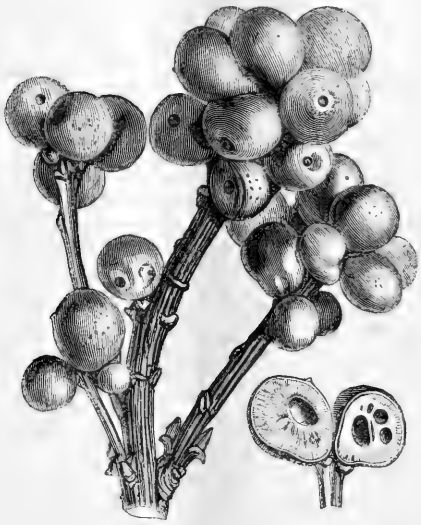
Fig. 19.



CYNIPS LIGNICOLA.

parenchyma, closely adherent to the wall of the contained larva-cell, which is situated near the basal attachment of the gall; the wall of the larva-cell is of a yellowish white colour. The gall attains its maturity late in the autumn, but is not deciduous. When kept in-doors during the winter the perfect insect emerges in April, but in the open air it does not make its appearance until May or June.—*G. L. Mayr.*

Fig. 20.



Cynips conglomerata (and in section).

20. *Cynips conglomerata.*—This gall generally occurs in clusters on dwarf bushy plants of Quercus sessiliflora and Q. pedunculata, and less commonly on similar plants of Q. pubescens. Each gall is about the size of a large pea, and, especially when solitary, is spherical in form, but when a number are clustered together, and appressed to one another, the sides of each separate gall become flattened where they meet, and the galls often become somewhat confluent at the base: in such instances they frequently

deviate more or less from a strictly spherical contour. These galls are not very hard; they are smooth, and of a green colour, but become dingy yellowish brown towards autumn. When of normal form each gall has a small pseudo-stigma [ombilic] exactly opposite the point of attachment at the base: similar processes, however, frequently make their appearance on other parts of the surface; and again sometimes they are entirely absent. In section these galls, when recent, exhibit a layer of green bark, which subsequently becomes hard and brown. The interior consists of a spongy parenchyma, which, in recent specimens, exhibits a greater or smaller number of green spots. The inner gall is situated under the pseudo-stigma [ombilic], when this exists, and is closely adherent to its surroundings. The perfect insect generally emerges in November. In many cases the galls of Cynips conglomerata may be mistaken for those of C. Lignicola, but are always to be distinguished by their green colour until late in the autumn, when they become of a somewhat yellowish brown tint: the frequent presence of the pseudo-stigma, the two different kinds of reticulation in the interior, and in many instances the position of the inner gall close to the pseudo-stigma, serve to distinguish it from that of C. Lignicola. This gall is sometimes so abundant that the young crippled shoots of the oak-bushes are thickly sprinkled with them.—*G. L. Mayr.*

Life-histories of Sawflies. Translated from the Dutch of M. S. C. Snellen van Vollenhoven by J. W. May, Esq.

(Continued from p. 255.)

Selandria Annulipes, *Klug.*

Imago: Klug, die Blattwespen nach ihren Gattungen und Arten in Der Gesellsch. Naturf. Freunde zu Berlin Magazin, &c., 8er Jahrg. p. 70, No. 49; *Hartig, Blatt- und Holzwespen*, p. 279, No. 46.

Larva: Ratzeburg, Die Forstinsecten, Th. iii. p. 130, No. 39; Taf. iii. f. 7.

Selandria parva, nigra, nitida, tibiarum tarsorumque basi alba, alis fusco-nigris, apice hyalinis.

A glance at our engraving will show that we have here to do with an insect related to Selandria æthiops, *L.*, the well-known caterpillar of the pear-tree; indeed, Ratzeburg's description of the one follows immediately upon that of the other. In a systematic arrangement, however, they would not be placed so near together; they are in the same genus of Hartig, but, on account of the difference in the neuration of the wings, not in the same division: this may suggest the question whether the divisions of this author, according to the neuration, are always equally natural,—a question which I hope to answer, if I succeed in rearing a third species of caterpillar (nut-brown, living on the oak).

At the end of May, 1866, I took a female of Selandria annulipes, on a lime-tree in my garden, after the insect had been flying about for some time in the sunshine among the large leaves of that tree. On the 8th of June following I perceived some very small caterpillars on the under side of a leaf of the same tree (see fig. 1, *a*, *a*, *a*): not far from each of these larvæ was a little pocket, formed of the skin of the leaf (fig. 1, *b*, *b*, *b*), of a very pale green, and having a little hole bitten out of the middle; in these pockets the eggs had been placed, from which the larvæ had emerged. Ratzeburg has made precisely the same observation, as appears in his work, referred to at the head of this paper. The larvæ gnawed little pieces out of the under epidermis and parenchyma of the leaf, as represented at fig. 2, magnified, so that the leaf on which they lived was speedily covered above and below with little brown spots, where the cuticle only was left. Afterwards, when many larvæ have damaged the leaf in this way, it dies and curls up, which has induced Ratzeburg to class Selandria annulipes as specially injurious in gardens.

My young larvæ were very shining, as if they had been covered with varnish: they were of a very pale gray, with nut-brown heads; the anterior segments of the body were broad, narrowing posteriorly; the broad intestinal canal, which was of a green colour, showed through the body, and had a black longitudinal line at the end, which was simply the excrement seen through the skin. I counted twenty-two

legs:* the thoracic legs had gray rings at the base; the abdominal legs were moderately large, becoming smaller towards the tail; but the last pair in these young larvæ was only to be detected with difficulty.

On the 14th of June the largest larva had grown to the length of a centimetre (fig. 3); figs. 4 and 6 represent it somewhat magnified. The colour of the little animal, which was very viscid, was a sordid yellow, in which the dark green intestine showed out distinctly. When viewed from above, the head appears of a purplish tint, and at the same time one seems to see an indication of two legs on either side, in consequence of the transparency of the skin at the side of the anterior segments. Looked at from the front, while it feeds, the larva has the appearance of fig. 6: it moves its head right and left for the purpose of eating, and looks then something like a grazing cow lying on its belly. The head is nut-brown, flat anteriorly, and covered for a great part by the skin of the 1st segment; the vertex is blackish, and, as the skin by which it is covered is yellowish, it shows through purple, according to the law of complementary colours. The eyes are in oval black spots at the sides; the horns, or feelers, below the eyes, are pretty long. The first pair of legs is of a yellowish colour; the second and third gray, with white rings; the claws were placed at right angles on the last joint of the tarsi.

The beautiful appearance of the white air-tubes, which could be seen through the skin, was very remarkable: this was specially visible in the last two segments, when the branching of the tracheæ appeared, as represented at fig. 5, somewhat more highly magnified. When they were not feeding they bent the head forward, nearly flat against the surface of the leaf, which almost entirely deprived them of the appearance of living animals. No trace of hair was to be seen; and in the examples which came under my observation I could perceive nothing of the stellate brown hairs, which Ratzeburg states that he observed in the case of a single individual of the autumn brood. The larvæ crept into the ground to undergo their change; and I am unaware whether they made cocoons or not.

* I may here mention that the brown caterpillar of S. æthiops, which, according to Réaumur, De Geer, and Hartig, has twenty legs, has in like manner twenty-two, but often retracts one or two pairs under the skin.

The development of the imagos followed pretty speedily. On the morning of the 6th of July I found two males had come out; another appeared on the 7th, two on the 9th, and so on up to seven,—these were all males: they were all much smaller than the female I had taken on the lime-tree just after she had deposited her eggs, or, to speak more precisely, just before I saw the freshly-produced larvæ; as to colour and other characteristics they completely resembled the females.

The female in question is represented at fig. 7. Head and thorax shining black, clad with a fine brown pubescence; mandibles ferruginous, with black tips. The antennæ are black, somewhat hairy; the first two joints cup-shaped, not very small; the third nearly half as long again as the first two joints together, ending obliquely at the apex; the fourth not more than two-thirds of the preceding joint, the remainder diminishing regularly in length and breadth; the last joint conical. The abdomen rather broad, shining black, without hair. As regards the legs, the coxæ and trochanters are black; the femora of the first pair black, with a rather broad pale red spot on the knees; those of the second pair have the spot smaller; the femora of the last pair are entirely black. The anterior tibiæ are brownish yellow, white at the base; those of the second pair somewhat darker at the apex; the tibiæ of the last pair are black, with the base obscure white; the tarsi are respectively of the colour of the tibiæ to which they belong. In the living insect the wings are purplish black; in the dead insect brown, with the exception of the apex, which is white and transparent. In the second and third submarginal cells are some black horny dots; the anterior portion of the anal cell (area lanceolata) has an oblique transverse nervure. The insect was only six millemetres long, expanding to eleven millemetres.

The males only differed in being much smaller (four millemetres), having proportionately longer antennæ, and in having merely narrow white rings on the tibiæ and tarsi of the posterior legs.

Ratzeburg considers that in favourable years this species may produce three generations; and I am quite of his opinion. Supposing the first imagos to appear, in warm seasons, in the beginning of May, then the second brood

would appear by the middle of June, and the third in August. I do not even see why there should not be four generations, although I admit there is little chance of it in our climate.

In conclusion, I must remark that Ratzeburg has made a slip of the pen in stating that the "black-gray smoky wings are lightest at the base and darkest at the apex:" it must evidently be just the reverse. It is, moreover, somewhat singular that, having reared the insect, he makes no mention of the male. Can it be that my having reared a brood of males is to be regarded as a rare occurrence? It is well known that in the case of the sawflies the females occur in much preponderating numbers; even in some not rare species the males are to this moment quite unknown.

Netherland Insects. Translated from the Dutch of CHRISTIAN SEPP by EDWIN BIRCHALL, Esq.

(Continued from p. 154.)

"DE KLEINE GESTREEPTE WITJES-VLINDER."

The small, striped, white butterfly (Pieris Napi).

HAVING now before me the task of describing a butterfly of the second order, it seems to me best to state something beforehand about the character of these insects. In the first section, about the butterflies of the first order, I named the common character, which all butterflies have in caterpillar and pupa, both in the first and second orders; consequently it is unnecessary to repeat this in the present chapter; but, as I then gave the peculiar character of caterpillar, pupa, and fly, of the first order, so now I give herewith the character of caterpillar, pupa, and fly, of the second order:—

(1) The eggs, out of which these insects take their beginning, have not all the same form: some are longish, and pointed at the upper end, others round; and of these some are round like a ball, others round like a plate, some smooth, and others rough; in colour they incline to white and yellowish chiefly.

(2) The caterpillars of this order have no spikes, but mostly very fine, short hairs.

(3) Their heads are round.

(4) The especial character of this order is the way in which the caterpillars prepare themselves for the change into the pupa, as in this they differ from all other caterpillars, either of day or night moths; for, besides, like the caterpillars of the first order, attaching their hinder part firmly by means of a fine web to the place where they are about to undergo the change, they stretch across the middle of their body a thread, which they attach firmly on the other side of their body: and this cross-thread, or band, is an unfailing characteristic by which these caterpillars, when undergoing the change, can be distinguished from all others.

(5) The pupæ of this order are not all of one shape: some have points or projections, and are thus similar to those of the first order, although the points of the former are differently placed from those of the latter; others are without points, and thus resemble more the pupæ of moths.

(6) But the surest characteristic of the pupæ of this second order is the above-named cross-thread, or band, by which they may be distinguished from all other pupæ of day and night moths.

(7) The butterflies of the second order have six perfect feet, and are by this means easily to be distinguished from the butterflies of the first order.

(8) Their under wings are proportionately smaller than those of the butterflies of the first order, as the latter always cover their bodies with their wings when in a state of rest, but the former only very seldom, if at all. . . . . .

§ 1.—Let us now proceed to the description of the present example,—the small, striped, white butterfly. But some will say—Is it worth while to trouble oneself with such a trifle? Is it fitting that man should make for himself work by enquiring about vermin? Fie! away with this excrement of Nature! Should we occupy our leisure hours with such trash? It may be said that vermin are found amongst the works of the Creator, but what need is there to honour them by curious research and description? Such, alas, is the evil talk of some, whenever they are asked to contemplate the works of God, and especially those works which, according to their narrow notions, are despicable. What a lamentable way of talking! No wonder that that great zealot for the

honour of God, the highly-gifted Brocks,* has alluded to such people in a trenchant, though short, poem, in order, if possible, to bring them to repentance.

"Saint John says well, that if a man shall say,
'I love the Lord,' and yet shall love his brother not,
He is indeed
Most worthily
A liar called;
For he who hates his brother whom he sees,
And whom before his eyes for proof has got,
How can he then love God, whom he sees not?

And Nature's book, too, says, if any say,
'I honour God,' whom in His works he honours not,
He is indeed
Most worthily
A liar called;
For he who holds the works of God unfit
For careful thought, although he sees them plain,
How can he honour God, whom he sees not?"

Truly, the contempt which a man has for the creature is a clear proof of contempt for the Creator himself: for whosoever shall despise the Master's work, which is wrought out in every part perfect and with excellent wisdom, he despises indeed the Master himself. Let no man advance here the argument that a difference must be made between one creature and another, and that the most despicable need not be regarded. Nothing throughout Nature is low. I say that the great Creator has made nothing which is unworthy of our observation and admiration. Is there a lower object than a grain of sand? And yet what a wonder-work of the Most High; for no mortal, however ingenious and powerful he be, can make even that out of nothing. How much rather should we wonder in abasement whenever we attentively observe a despised insect? A thoughtful mind perceives as much art, wisdom, and might, in the construction of the smallest fly, as in that of the largest elephant; for it would be more possible (or it would at least seem more easy of comprehension) for a man to make an elephant than to produce a minute animal, such as a fly, and supply it with eyes, mouth, heart, lungs, belly, and other internal and outward parts, and everything else most perfectly prepared. But why do I talk of the smallest fly or other insect? The

* In his 'Irdisch Vergnügen in Gott.,' p. 534, of the fourth Hamb. edition.

sharp-sighted Lewenhoek has discovered insects, through his microscope, each of which is a hundred million times smaller than a grain of sand. . . . . But far, very far, be it from any man to consider such a seemingly unimportant creature unworthy of his observation, for it might serve to turn our thoughts back from it to its Almighty Creator. Is it not true that men admire much the buildings of princely houses and courts: men have the greatest esteem for their architects, and willingly concede to them art and ingenuity; but sound reason proves to us that all the most glorious palaces of the whole world, nay, all works of art and science, made by man, are not at all to be compared to the construction of one such animal; for from them streams forth a wisdom and omnipotence, before which all man's wisdom and power dwindles into a shadow. . . . . Is it not, therefore, very becoming that a man should spend his leisure time, or, at any rate, some of it, in contemplation of the animal kingdom? Let a man, I say, fix his attention upon these wonders of the Highest Wisdom. But consider, that such a living speck of dust,—what do I say?—that such a living being, many thousand times smaller than a speck of dust, is supplied with the utmost perfection, not only of the outward parts,—with their skins, joints, tendons, &c., and thus placed in the position of a being able to move quicker than many of the largest animals,—but also with everything that is necessary to the internal arrangement and the circulation of the fluids, without which no organized being can exist: and still the whole animal above named is a hundred thousand times smaller than a grain of sand; but think how many million times smaller than the animal must that be out of which it was made. Let us observe, also, in considering this amazing, this unspeakable smallness, that care is taken for the continuation of such (as it were) invisible creatures, and our thoughts must be silenced in amazement. What think you, worthy reader, are they not the works of art of a boundless omnipotence, conceptions of an unsearchable wisdom, proofs of an endless goodness? Do we not find in these trifling things a most convincing proof of the infinite greatness of Him who made them out of nothing? In short, do they not convince us of the truth that there is a God? Now, I ask whether the contemplation of such seemingly

insignificant creatures is trifling and useless? and whether they do not lead us up to a knowledge of our adorable Creator? Let us, then, following the steps of those who honour God in his works, walk boldly forward to inspect the insect-world. Behold, here, the history, or way of life, of an insect, in the person of a butterfly of the second order.

§ 2.—Of the white butterflies, four sorts are known to me, namely:—the large butterfly, Pieris Brassicæ; the small butterfly, P. Rapæ; the great striped butterfly, (?)P. Daplidice, which I have not seen in this country, but Dr. Rösel has described and drawn it in the first part of his 'Insecten-Belustigung,' p. 45, of the second collection; and the small striped butterfly, P. Napi, which that author has not in his work. The last-named insect shall for the present occupy my pen. This butterfly is one of the first to show itself in the spring, but not one of the commonest, as it is not found nearly so frequently as the large and small butterfly. It lays its eggs singly, and leads a lonely life in the caterpillar state. During all the time that I have occupied myself with the study of insects, it has only once happened that I have been able to secure a single egg of this insect. My son found it, about the end of May, on the downs, near Haarlem, on a leaf of one of the wild kails. . . . . I am strongly of the opinion that the insect deposits its eggs on other plants. The egg above named was placed on the under side of the leaf. . . . . Its shape is longish, inclined towards a point at the top; by the under or broader side it is gummed on to the leaf; and thus, like pretty nearly all butterfly-eggs, it has the point always turned away from the leaf. . . . . It has twelve ribs, of which six run out nearly at the top, and the other six alternately a little lower. Cross over, in the circumference from the top to the bottom, it is banded with a great number of slightly-embossed stripes. It is shiny, and of a whitish yellow colour, having thus, when seen through a microscope, a beautiful appearance.

§ 3.—A couple of days after I got the egg I observed that its brightness quite disappeared, and that it became dull in colour; whereupon, in about the course of one day, the caterpillar appeared, and in the first place ate up the top of its egg half-way. The little animal was thus of a whitish colour, and, through the microscope, appeared all over shiny

and transparent, stuck over with a few fine hairs. As soon as the caterpillar began to graze upon the leaf it became a little greener; and when it had become one or two days old it gave up eating the leaf anywhere but on the edge, or else it made holes in it. Four days after its birth it moulted for the first time, and shortly afterwards ate the skin thrown off; and this it did on every following occasion. Then it still appeared, under the microscope, quite shiny, as before, especially its head, was as transparent as glass; and that, as well as the whole caterpillar, set with single, black, stiff, little hairs, standing chiefly on white knobs, and the rest on black spots. Moreover, it had round about it a great number of black spots, following the course of the above-named rings; but these and the white knobs were so uncommonly fine that one could only distinguish them by aid of the microscope, melting away, as it were, into the green ground of the colour of the caterpillar, whereby the animal appeared to the naked eye of a pale green, and became paler as it grew larger and older. Our caterpillar, after having moulted three times more, at intervals of about four days, remained, after the last moult, six days eating and growing, and reached its maturity on the twenty-second day. . . . . Here I beg to remark that, at first sight, there is such a great likeness between this sort of caterpillar and that of the ordinary small butterfly, P. Rapæ, that one can hardly distinguish one from the other, unless one pay attention to two characteristics, which do not at all strike the eye at first, to wit—over the back of the small butterfly caterpillar runs a very faint, pale yellow stripe, which is not the case with the caterpillar under discussion; further, the spiracles of this caterpillar are surrounded by a little yellow ring, which is wanting in the kind before named, but in the same place both of them have a short yellow stripe near the spiracle. In all other respects these two kinds of caterpillar are exactly alike.

§ 4.—Our caterpillar having, as we said, reached the age of twenty-two days, forsook its usual haunts and food, seeking a suitable place for its coming change; and, having found this, it remained quiet for half a day. After that it spun itself fast, the same day, in the usual manner of the butterfly caterpillars of the second order, to wit—having fastened its hinder end, by means of a fine web, it spun across its body a

thread, which, though composed of several threads, was uncommonly fine, and thinner than a hair; thus it lay, patiently waiting for its change. Meanwhile it curled itself somewhat more together, or became a little shorter and thicker, and the following day changed itself into a pupa. . . . Between this pupa and that of the small white butterfly there is likewise scarcely any difference, but the former is somewhat more yellowish and less speckled than the latter. In the course of eight days our pupa changed in colour, and was strikingly yellower: at last the wings of the butterfly began actually to appear through the pupal case.

§ 5.—Finally, after our insect had passed ten days in the pupal state it appeared in its last, or glorious form, being now a perfect butterfly, which, although it had no gleaming colours, charmed the eye by its beautiful whiteness, coupled with modest yellow, which set off strongly its black ornaments; or with its wings folded over its back, with their under side striped with a greenish gray; which has given occasion to the name of the insect. I beg further to make the observation, that this insect is found twice a year, namely, spring and summer.

---

*The Classification of the Rhynchophorous Coleoptera.**

By John L. Leconte, M.D.

[Reprinted from the 'American Naturalist' for July, 1874.]

At a meeting of the Academy held in Washington, January, 1867, I had the honour to offer some remarks† upon the systematic value of the great complex of Coleopterous insects known as Rhynchophora.

It was my intention, as then stated, to follow the memoir just mentioned with another, in which the classification of the Rhynchophora and separation into families should be discussed, in the hope of developing a more satisfactory system of arrangement than had been thus far obtained.

Circumstances have prevented me from following this particular line of investigation, to a definite result, until

* Read before the National Academy of Sciences, Washington, April 21, 1874.

† 'Am. Jour. Science and Arts,' xliv.; July, 1867.

within a short time, though it has frequently occupied my attention for brief intervals. The time, however, has not been altogether lost, for I found that, with each return to the investigation, I obtained an additional, though small, insight into the constitution of this complex, which has been the subject of repeated efforts by the most laborious and successful students of Entomology in Europe.

The bases of the classification of the Rhychophora, which have been proposed, are briefly these:—

I. Schonherr* treated the great mass of these insects (excludiug only the Scolytidæ) as constituting a single family, divided as follows:—

A. Antennæ not geniculate; antennal grooves wanting. - - - - - ORTHOCERI.
Bruchides, Anthribides, Camarotides, Attelabides, Rhinomacerides, Ithycerides, Apionides, Rhamphides, Brenthides, Cylades, Ulocerides, Oxyrhynchides.

B. Antennæ geniculate; grooves almost always distinct. - - - - - GONATOCERI.

a. Rostrum short, deformed; antennæ subterminal. - - - *Brachyrhynchi.*

* Antennal grooves extending below the eyes; Brachycerides, Entimides, Pachyrhynchides, Brachyderides, Cleonides, Molytides, Byrsopides (the last with the rostrum received in aprosternal excavation).

** Antennal grooves directed towards the eye; Phyllobiides, Cyclomides, Otiorhynchides.

b. Beak cylindrical, slender; antennæ inserted far behind the tip. Erirhinides, Cholides, Cryptorhynchides, Cionides, Rhynchophorides, Conoderides, Cossonides, Dryophthorides. - - - *Mecorhynchi.*

In the gradual progress of the work this last legion, the Mecorhynchi, were divided into Synmerides, having the front coxæ contiguous, and Apostasimerides, having them distant. The distinctions between the tribes above mentioned were founded mostly on insignificant and evanescent modifications in the form of beak and antennæ; so that with the

* 'Genera et Species Curculionidum;' Paris, 1833—1844.

immense mass of genera and species described, it became quite impossible to determine either from the work itself.

II. Although the faults found with this artificial system were neither few nor vaguely expressed, yet it was not until the progress (1863) of his admirable work on the 'Genera of Coleoptera,' by my deceased friend Prof. Lacordaire, required this immense labour to be done over again, that any attempt was made at a new arrangement. The system of Lacordaire was essentially this:—The series was divided into six families,—Curculionidæ, Bruchidæ, Anthribidæ, Brenthidæ, Uloceridæ, and Scolytidæ: of these the Bruchidæ were recognized as having scarcely any relations with the other families, and pertaining rather to the Chrysomelidæ, with which they have since been associated by most authors. The Bruchidæ and Anthribidæ were characterized by having a distinct labrum; the Scolytidæ by the compressed and dentate tibiæ; while the Brenthidæ were separated rather by form than by any distinct structural character. The Curculionidæ were then divided, according to the size of the mentum, into—

I. Mentum closing the buccal space, and concealing the maxillæ. - - - ADELOGNATHI.
Eyes rounded; prothoracic lobes indistinct. *Cyclophthalmes.*
Eyes large, depressed, transverse, narrowed below; prothoracic lobes well marked. - *Oxyophthalmes.*
II. Mentum smaller; maxillæ visible. - - PHANEROGNATHI.
A. Front coxæ contiguous, or nearly so. - *Synmerides.*
a. Pygidium covered by the elytra; claws not appendiculate.
Metasternum short; episterna narrow.
Gular peduncle wanting.
Gular peduncle distinct.
Metasternum long; episterna rather wide.
Antennæ geniculate.
Antennæ straight.
b. Pygidium exposed, or claws appendiculate.
Ventral segments not angulated at the sides.
Ventral segments angulated.
B. Front coxæ separated by the prosternum, which is frequently channelled for the reception of the beak. *Apostasimerides.*

a. Oral organs normal. Club of antennæ annulated; third joint of tarsi bilobed.
Mesothoracic epimera not ascending.
Mesothoracic epimera ascending.
b. Oral organs abnormal; first joint of antennal club usually very large, corneous; third joint of tarsi rarely bilobed.
Pygidium exposed.
Pygidium covered by elytra.

Each of these divisions contains several tribes differentiated by characters of smaller importance, and not unfrequently indefinite.

III. The next attempt at a general classification was made by Mr. H. Jekel.* This excellent author recognized with great clearness, and defined with tolerable precision, the following eight principal types among the Rhynchophora:—Bruchides, Anthribides, Attelabides, Curculionides, Calandrides, Cossonides, Scolytides, and Brenthides. The last-cited memoir is occupied chiefly with a further development of the classification of the largest of these, the Curculionides proper; and in it he proceeds to separate, as sub-families,†—Brachycerides, Brysopides, and Amycterides: epigeal forms, in which the tarsi are not dilated, and not furnished with brush-like hairs beneath. Having thus isolated them, the great mass remaining is divided into—

Body dissimilar in form, male and female; narrower in male. - - - - - PLATYGNES.
Beak similar in both sexes. - - - *Homorhines.*
Beak dissimilar. - - - - *Heterorhines.*
Body nearly or quite of the same form, male and female.
Pygidium covered by the elytra; body pollinose or pubescent. - - - - ISOGYNES.
Pygidium exposed or covered; body squamose, &c. - - - - METRIOGYNES.

* Annales Ent. Soc. France, 1864, p. 537; Ins. Saundersiana, 155 sqq., 1860.

† Mr. Jekel gives to the anomalous groups this subordinate position, rather, as he says, "Pour ne pas heurter les idées généralement admises," than in accordance with his own views, which would lead him to regard them as I have done,—as genuine families.

Pygidium covered. - - - -	*Cryptopyges.*
Pygidium exposed. - - - -	*Gymnopyges.*

The principal types contained in each of these three grand divisions are then characterized in a very clear manner; but for a proper understanding of this system, a vast improvement on all that preceded, the reader must refer to the original memoir. In developing the arrangement of the tribes represented in our Fauna, I shall be largely indebted to the views expressed in this most valuable memoir of Mr. Jekel. There remain to be mentioned two Faunal contributions to the history of this subject:—

1. A series of remarks by Mr. Suffrian,* in which the German species of several genera, not before carefully studied, are more fully elucidated, and various criticisms upon Schönherr's system made.† The necessity of a more careful study of the tibiæ and tarsi, almost neglected by Schönherr, is insisted on, and an arrangement of the German genera in groups upon these characters is given.

2. That most admirable work of Prof. C. G. Thomson,‡ to which no entomologist ever refers without finding original material by which he can profit; a remarkable instance of the good results to be obtained by a careful and intelligent study of a very limited Fauna. The Rhynchophorous series is divided as follows:—

Segments of the abdomen immovable; 2nd and 3rd nearly equal. - - - -	Isotoma.
Bruchidæ, Anthribidæ (including Urodon), Rhinomaceridæ, Attelabidæ.	
Abdomen with the 1st and 2nd segments connate; the remaining three movable; the 2nd usually much longer than the 3rd. - - -	Anisotoma.
Apionidæ, Curculionidæ, Cossonidæ (including Calandra), Tomicidæ.	

From a survey of the different schemes of arrangement, which have been thus briefly reviewed, it is evident that while the principal types of the Rhynchophorous series, and the main divisions of the great family Curculionidæ have

* 'Bermerkungen über einige deutsche Rüsselkäfer: Stettin, Ent. Zeitsch,' i.—ix.

† See specially *op. cit.*, 1847, 157.

‡ 'Skandinaviens Coleoptera,' vii., Lund. 1865.

been clearly perceived, the attempts to define these important forms have failed in a greater or less degree, on account of the want of proper subordination in the characters made use of: all of them natural, all of them important, though in a less degree than supposed by the expounder of each particular system.

To supplement the memoirs above referred to, there came, in more recent times, the beginning of a systematic study of our species of Curculionidæ, by Dr. George H. Horn, a careful and conscientious study of the Calandridæ and Cossonidæ, and of some Mecorhynch genera of the United States.* In the introductory remarks he observes:—"One character is mentioned in the following pages that appears to have escaped notice. In most, if not all, of the genera of Mecorhynques, the males have eight, and the females seven dorsal abdominal segments. The Calandrides and Cossonides appear not to possess this character, as also all the Brachyrhynques which I have had time to examine."

The value of this original observation of Dr. Horn is very great, but the limitation which he has placed upon it, though correct as regards the Calandride and Cossonide types, is erroneous as regards the Brachyrhynes, which have the abdominal sexual characters precisely as in the genera in which he first observed them. So, too, have the Brenthidæ, and all the anomalous sub-families of Curculionidæ in the Jekelian system. It appears, therefore, that this peculiarity of structure is of much more importance than was supposed by Dr. Horn, and, that it must in reality be the defining character for the division of the Rhynchophora into primary series, of more than family value. I therefore prepared a series of dissections of each of the well-recognized Rhynchophorous types within my reach, and have come to the conclusion that they may be arranged in three sets, each of which has a corresponding value to the individual series of normal Coleoptera (*e. g.* Adephaga, Clavicornia, Lamellicornia, &c.); and upon subordinate characters (some of which have been already employed in the classifications above mentioned, though in an empirical manner) into families, as follows.

* "Contributions to a Knowledge of the Curculionidæ of the United States." (Proc. Am. Philosophical Soc. 1873, 407.)

Series 1. Haplogastra.

Abdomen alike in both sexes; dorsal segments seven, coriaceous, with the exception of the 7th, which forms the pygidium, and which is small and corneous; ventral segments not prolonged upwards into a sharp edge; elytra without lateral fold on the inner surface; epipleuræ usually distinct; antennæ straight, 11-jointed; ungues usually bifid or toothed, rarely (Rhinomacer) simple; front coxæ conical, prominent; prosternum very short in front of the coxæ; the beak varies in length and thickness, but not according to sex, so far as I know; the front coxæ are contiguous, except in one genus of Rhynchitidæ (Pterocolus); the ventral sutures of the abdomen are straight; the mandibles and tibiæ vary in form, and furnish convenient characters for division into families:—

A. Ventral segments nearly equal in length; epipleural indistinct; tibial spurs small; claws simple (always?). Mandibles simple, flat; labrum distinct. - - - -	Rhinomaceridæ.
B. Ventral segments diminishing in length; epipleuræ distinct; labrum wanting; claws bifid, or appendiculate.	
Mandibles flat, toothed on each side; tibial spurs small. - - - -	Rhynchitidæ.
Mandibles stout, pincer-shaped; tibial spurs large. - - - - -	Attelabidæ.

The affinities of this series are in an ascending direction with the rostrated Heteromera (Oedemeridæ and Pythidæ): this is indicated by the softer tissues in Rhinomaceridæ, and certain Rhynchitidæ, and also by the presence of a labrum in the former. In a descending direction the Attelabidæ lead to the true Curculionidæ, and the Rhynchitidæ to the Belidæ, the last family in the third series of Rhynchophora. The habits of the species of this series are peculiar, and quite different from those of the next series, and indicate, as is wisely observed by Lacordaire,* for the care of their progeny, an industry which appears here for the first time in the family. I cannot describe the results of this instinctive or intelligent industry better than by

* Gen. Col. vi. 543.

condensing the account of the author just cited, referable, however, to European species.

1. *Rhinomaceridæ.*—The European species deposits the eggs in the male flowers of Pinus maritimus, the development of which is thus prevented. I may be allowed to observe that this synthetic genus, the nearest approach in the Rhynchophora to the lower Heteromera, and therefore the representative of old forms clings to an old and synthetic type of vegetation.

2. *Rhynchitidæ.*—Some of the species of Rhynchites roll leaves in the manner of the next family; others deposit their eggs in young fruit, the kernel of which is eaten by the larva; others, again, place the eggs in the undeveloped buds of trees, which are thus destroyed.

3. *Attelabidæ.*—In the spring the females roll up the leaves of the trees, and deposit in each an egg. After emerging from the egg the young larvæ eat the inside layer of the case which covers them, which they probably leave at a later period, when their growth is complete, to perfect their metamorphosis under ground.

These three families are of small extent, and but little need be said regarding their classification.

Rhinomaceridæ.

This family is represented in our Fauna by two species,—one on each slope of the Continent,—and is easily recognized by the depressed, curved, and acute mandibles, and distinct labrum. The pygidium is covered by the elytra, which are punctured, without any appearance of striæ. On the inner face there is no trace of a lateral fold; the epipleuræ are indistinct.

Attelabidæ.

Four species of Attelabus on the Atlantic slope are the only representatives thus far known in our Fauna. The beak is stouter than in the preceding family, and the mandibles thicker and stronger; the epipleuræ are quite distinct, and there is no trace of a lateral fold on the inner face of the elytra; the pygidium is not covered by the elytra, and is impressed along its upper margin for the reception of the

apical edge of the elytra;* the tibiæ are armed with large spurs.

RHYNCHITIDÆ.

The peculiar form of the mandibles requires the separation of these genera as a distinct family. The teeth on the inner side are well developed, as usual, but, in addition, the apex is prolonged outwards into an acute process, behind which is another large tooth;† the front coxæ are usually contiguous, large and conical,—in one genus (Pterocolus) widely separated; the pygidium is either exposed (Rhynchites, Pterocolus) or covered by the elytra (Eugnamptus, Auletes); the epipleuræ are narrow, but distinct; and on the inner face of the elytra, remote from the margin, may be seen a short, straight fold, the homologue of the well-defined fold, which limits the lateral groove for the reception of the side margin of the ventral segments, observed in all the following families.

(To be continued.)

Mode of Oviposition in certain Lepidoptera. By the Rev. P. H. JENNINGS.

I HAVE much pleasure in sending you a few notices of the manner in which some moths deposit their eggs, together with other items concerning them. If they are acceptable to you, and you think will tend to general edification, I shall be happy to send you more as occasion may offer. At the same time, I should be very glad if others, interested in our favourite pursuit, would give us the benefit of their experience. While we all admire the beauty of the perfect insect, and desire to store our cabinets with specimens in the finest condition possible, yet how much more do we learn of the wonderful in Nature from an acquaintance with the habits given to the insect by its Almighty Creator, and exhibited both in the larval and perfect state.

Crocallis elinguaria.—A wasted female, taken in August, deposited forty-six eggs, of which some were laid on a sprig

* Compare in this relation the curious notch in the front part of the pygidium of Anthribidæ, for the reception of the sutural angles of the elytra.

† This character was first observed by Thomson, who observes (Sk. Col. vii. 28), concerning his tribe Rhynchitina, "Mandibulæ depressæ, extus excisæ, intus dentatæ."

of the food-plant, and some on the ground: they were in patches, placed closely side by side. Those on the food-plant were on the upper edge of the leaf, with one end projecting outwards. In shape they resemble a brick, with its edges and corners rounded off, perfectly smooth, and of a dirty white colour.

Phybalapteryx vitalbata.—A female, taken on August 27th, deposited twenty eggs on the food-plant, Clematis vitalba, of which fifteen were laid on the under edge of the leaf, four on the upper edge, and one on a foot-stalk. In shape oval, flattened on the upper and under sides. They were placed generally lengthwise along the edge of the leaf, sometimes attached end to end, slanting just sufficiently to allow of the egress of the caterpillar, sometimes almost side by side, and sometimes singly; the colour a very pale stone; large, for the size of the insect, and perfectly smooth. The caterpillars emerged in nine days, and have now (October 16th) all disappeared but two.

Melanippe fluctuata.—A fresh female deposited, from September 14th to 18th, seventy-three eggs, only three of which were laid on the food-plant, seven on the glass-cylinder, and the rest on the muslin cover. Those on the food-plant were on the edge of the leaf, two on the under side, and one on the upper. In shape oval; perfectly smooth and almost white, soon assuming a yellowish tinge. The caterpillars emerged on the 24th, and have now, October 16th, just moulted for the last time.

Tryphæna fimbria.—A wasted female, taken at sugar, September 12th, deposited, on the night of the 14th, three hundred and forty-nine eggs, beautifully arranged side by side on the under surface of a leaf of common sallow (Salix caprea). Approaching the edge of the leaf, she discontinued with the greatest regularity about the sixteenth of an inch from it. The space towards the interior was entirely filled up until the midrib was reached, which was carefully passed over; with the exception of those laid on the other side of it, not an egg was disconnected from the mass. They were Echinus-shaped and longitudinally ribbed; in colour a very faint yellow-green. The caterpillars emerged in about ten days.

Epunda lutulenta.—A female, taken at sugar, September 12th, deposited on the 13th one hundred and twenty-four

eggs, sixty-four of which were on the ground, and the rest on the food-plant, common gromwell (Lithospermum arvense). Those on the food-plant were almost all on the under side of the leaf, and often in pairs or triplets, but otherwise very much at random, there being no apparent order. Echinus-shaped, longitudinally ribbed. When fresh laid pale yellow in colour, assuming a streaked reddish appearance on the second day.

Orthosia Litura.—A female, taken at sugar, September 21st, deposited on the night of the 23rd one hundred and forty-seven eggs, in a compact and orderly-arranged mass, on the under surface of a leaf of common birch (Betula alba), very similar in size and shape to those of E. lutulenta. In colour, white when fresh laid; in a few hours the centre assumed a shade of reddish brown, and a ring of the same colour appeared round the middle. The caterpillars emerged the first week in October.

Miselia Oxyacanthæ.—A female, taken at sugar, October 12th, deposited twenty-nine eggs on the night of the 13th on its food-plant, common whitethorn (Cratægus Oxyacantha). In colour a faint yellow-green. Echinus-shaped; longitudinally ribbed; eight long and eight short ribs, the longer terminating in a point, and giving the eggs a conical shape, and forming an edge round a small crater. Most of them were laid indiscriminately on the upper and under sides of the leaves, singly, and near the edge; a few on the foot-stalk, just at the base of the leaf, or at juncture with the twig, or just on the twig itself.

Phlogophora meticulosa.—A female, taken at sugar, October 14th, laid one hundred and thirty-three eggs on the night of the 15th. In colour a faint yellow. Echinus-shaped; longitudinally ribbed; rather depressed at the top; ribs running up to the circumference of a small convexity. All deposited at random: eighty-one on the muslin cover, forty on the leaves of the food-plant, and twelve on the ground. Those on the food-plant without any order: some on the upper, some on the under side of the leaves, some on the edge, some on the inner surface, and some on the foot-stalk.

P. H. Jennings.

Longfield Rectory, Gravesend,
October 16, 1874.

Entomological Notes, Captures, &c.

Argynnis Niobe in Kent.—I should like to make a few remarks in reference to the plan suggested by Mr. Clifford, in the 'Entomologist' for October (Entom. vii. 225), for dissipating the doubts, which he says are still entertained by some entomologists, as to the recent capture of Argynnis Niobe in Kent. Mr. Clifford says:—"If the gentlemen who have made acquaintance with Argynnis Niobe will associate with themselves one or two entomologists of known skill in larva-hunting, and, without indicating the precise position of the valley or hollow between Wye and Ashford to the entomological world generally, arrange to make a careful united search for the larvæ of A. Niobe during the spring, we may possibly get a result conclusive enough to satisfy all sceptics." Now it seems to me that if this plan were to be adopted no satisfactory result could possibly be arrived at; for if the larvæ were not found, there would be no proof that they were not there; and if found, there would be no evidence how they came there. Some three or four years ago, while beating for larvæ in the High Woods here, I beat from an oak-tree a very large, handsome larva, that evidently belonged to a species not included among our native Fauna. For a moment I was completely puzzled, but immediately afterwards remembered that Dr. Wallace had been turning out a number of specimens of Bombyx Pernyi; and the mystery was at once solved. Another collector shortly afterwards beat three larvæ of this species, and later in the season several cocoons were found on oak-trees in the same locality. This seems to indicate that finding larvæ in a given locality is not in itself a sufficient proof of their British origin. Even if the eggs of Argynnis Niobe could be found laid naturally on the wild heart's-ease in the locality where the captures are reported to have been made, the question of the authenticity of the species would still remain exactly where it is now. Here, the only locality for Melitæa Athalia is being rapidly destroyed; and, fearing this pretty species should disappear from our neighbourhood altogether, I employed a man, three or four years ago, to collect all the larvæ he could find, and turn them down in another locality, about a dozen miles off, where the insect did not previously occur, but where the

food-plant abounds. In its new home the species has increased to such an extent that this season I found it quite common, and have no doubt that it will go on increasing rapidly. Of course it could not do so without laying eggs; and if eggs were found, would Mr. Clifford, or anybody else, consider that fact a sufficient proof that the species was native to the locality? Again, when collecting at Old Hall Wood, near Ipswich, some time ago, I was told by an Ipswich collector, whom I met there, that Limenitis Sibylla did not occur in that particular wood till it was introduced by an old collector, named Seaman, who brought a number of living specimens from St. Osyth, and turned them down there. Now, is it not possible that somebody may have "turned down" continental Niobe in Kent, which have been "turned up" by somebody else? People on the Continent could probably supply their English correspondents with eggs or larvæ; and if these were placed in favourable situations the perfect insects might reasonably be expected in due season. I do not, however, wish to express any definite opinion as to this particular case of Niobe; for, notwithstanding the scepticism to which Mr. Clifford alludes, its occurrence in Kent may possibly be quite genuine; and my object in writing is to warn entomologists against allowing themselves to be deluded by sham "proofs."—*W. H. Harwood; St. Peter's Colchester.*

Argynnis Lathonia and Catocala Fraxini near Canterbury.—I took a very fine specimen of Lathonia on the 3rd of August, also one on the 13th, three on the 23rd, one on the 1st of September, two on the 7th, and two on the 15th, at Pelhatham and Swarling Downs. Also one specimen of C. Fraxini in Pine Wood, where I have taken, in all, six in seven years, but none good till this one, which I took on the 26th of September, almost equal to bred. I have showed it alive to three or four gentlemen.—*G. Parry; Church Street, St. Paul's, Canterbury.*

Do the Larvæ of Saturnia Carpini Hybernate?—In reference to the query in the October number of the 'Entomologist' (Entom. vii. 227) by Mr. Robinson-Douglas, as to whether the larvæ of Saturnia Carpini hybernate, I may state that in the spring of this year I had cocoons of S. Carpini, from which the perfect insect emerged, and that I obtained

eggs, and finally larvæ, about the 15th of April, and I would suggest that the larvæ found by Mr. Robinson-Douglas in June were hatched from eggs laid in the spring, and not hybernated larvæ. I may also mention that I have two chrysalids from the larvæ I had hatched in the spring, from which I expected the perfect insect to emerge last August or September, but there seems no sign of such an occurrence even now; and I suppose I must expect the perfect insect to emerge next spring. But is not this very unusual? as I shall have no autumn brood of Carpini.—*George W. Oldfield; Castle House, Shrewsbury, October* 2, 1874.

Deiopeia pulchella in Hampshire (Entom. vii. 259).—"I am the captor of D. pulchella, on the 1st of October, 1818, at Hurne, near Christchurch. It is the only one I ever took, but I believe I saw two previously in September of the same year, and passed them as common white moths, and indeed was nearly passing the other, till it settled on the stubble so often that I was induced to look at it, and was most wonderfully surprised, as it was an insect I could not fancy was British. This was at six o'clock in the morning, and I immediately returned to the house, and, having set out the moth, I wrote to Dr. Leach, who put it in Samouelle's 'Entomological Calendar.'"—*The late J. C. Dale.*—[In a letter addressed to Mr. Corbin, who remarks:—"Fifty-six years, to the very day, have elapsed between the two captures."—*Edward Newman.*]

Deiopeia pulchella and Chœrocampa Nerii near Lewes.—On Friday, the 5th of June last, I took a fresh, though rather pale specimen of Deiopeia pulchella in a field of trefoil; and on the 3rd of September a relative of mine gave me a damaged specimen of Chœrocampa Nerii, which he had taken at rest in his garden in the middle of the town of Lewes. Is not the capture of Pulchella in June a rather uncommon event?—*Thomas Hillman; Delves House, Ringmer, near Lewes, November* 11, 1874.

Eupithecia Knautiata of Gregson (Entom. vii. 255) = *E. minutata of Hübner.*—I have read with considerable astonishment Mr. Gregson's note on his supposed new species of Eupithecia, which he proposes to call E. Knautiata. I am wholly at a loss to know by what process of reasoning Mr. Gregson has arrived at his conclusions. All I can say is this,—I have had the Bolton insect in all its

stages, from the egg up to the moth; and, after the most careful consideration, I am convinced that it is nothing but E. minutata. In this conclusion, I believe I am right in saying, that Mr. Doubleday, Mr. Hellins, and Mr. Buckler, who are no mean authorities, entirely concur.—[*Rev.*] *H. Harpur Crewe; Drayton Beauchamp Rectory, Tring, November* 2, 1874.

[I have received from Mr. Doubleday an opinion exactly corresponding with Mr. Crewe's.—*E. Newman.*]

Food-plant of Eupithecia innotata.—In the 'Entomologist' for March of the present year (Entom. vii. 68), Mr. Gregson states that he has for some time been acquainted with the true E. innotata, and that he has taken both the larva and the perfect insect at Wallasey: the former he says feeds on mugwort (I suppose he means Artemisia vulgaris). It may be so; but why does not Mr. Gregson send specimens to Mr. Buckler, who has drawings of the larva of the true Innotata, from specimens which I received from the Continent and forwarded to him. Assertions of this kind, without positive, ocular demonstrative proof, go for nothing at all. On the Continent the food-plant of E. innotata is Artemisia campestris: this plant is rare in England; it is, in fact, I believe, confined to the sandy heaths of Norfolk and Suffolk, where it grows in some abundance. During the last week in August of the present year, Lord Walsingham, with whom I was staying, kindly drove me over to Brandon, which is one of the head-quarters of the plant. I carefully beat about half a mile of flowers, but failed to find anything, except a few larvæ of E. centaureata and E. absinthiata. Since my return home, Mr. Williams, the rector of Croxton, near Thetford, has, at my request, carefully searched the Artemisia campestris in the neighbourhood of Thetford, but with no better success. In the absence of further proof I am compelled, with much reluctance, to come to the conclusion that E. innotata has not yet been ascertained with certainty to occur in England. If Mr. Gregson will send me larvæ next year, I shall be delighted to own myself mistaken.—[*Rev.*] *H. Harpur Crewe.*

Contribution to the History of certain Lepidoptera: Lithosia sericea, Hyria auroraria, Acidalia circellata, A. subsericeata, and A. fumata.—Lithosia sericea (? Molybdeola): obtained a fine batch of eggs on the 6th of July;

hatched in ten days; fed on knot-grass and lettuce; did not thrive well, and when about half grown began to die off. Hyria auroraria: eggs deposited on the 6th of July; hatched in about nine days; larvæ fed on knot-grass; one imago appeared on the 13th and one on the 16th of September. I have a number of larvæ hybernating, some of which are apparently full grown. Acidalia circellata: obtained five or six eggs on the 6th of July, from which I bred four imagos; eggs hatched in about eight days; larvæ thrive well on knot-grass; the first moth emerged on the 7th September, the others a few days later. A. subsericeata: eggs deposited freely 6th June; hatched in ten days; food, knot-grass; commenced pupation about 18th July; the first moth appeared 30th July; bred a fine series. I have still a number of larvæ, apparently full grown, obtained from the same supply of eggs. A. fumata: obtained a few eggs on the 6th July, which hatched in seven days; fed on knot-grass; most of the larvæ died when full grown; a few are still alive. I have made several attempts to carry this larva through the winter without success.—*R. Kay;* 2, *Spring Street, Bury, Nov.* 6, 1874.

Tapinostola Bondii at Lyme Regis.—In the September number of the 'Entomologist' (Entom. vii. 205) Mr. Tugwell records the capture of this species at Lyme Regis, saying that he thinks it a new locality for it. In this, however, he is mistaken, as I met with the species there in July, 1863 (eleven years ago), and recorded its occurrence there in the 'Zoologist' for that year (p. 8861). Mr. Tugwell's notice of this insect is, however, of considerable interest, as it serves to prove that it is still to be found at Lyme Regis as well as at Folkestone, and probably at other places on the south coast. —*P. C. Wormald;* 2, *Clifton Villas, Highgate Hill, N., November* 5, 1874.

Abundance of Polia flavocincta at Huddersfield.—On the 2nd and 3rd of October, Flavocincta was unusually numerous at sugar here. The weather then became cold and wet, and sugar was of no use. Last week Flavocincta appeared again at sugar, but not in such large numbers.—*George Brook; Fernbrook, Huddersfield, October* 19, 1874.

Lycæna Argiolus Ovipositing.—Early last April I had the pleasure of watching a female of Argiolus apparently depositing her eggs on the flower-buds of the holly, in a garden near

to Vauxhall Bridge: thus London is not quite bereft of butterflies.—*T. P. Lucas.*

Honey Bees.—On Sunday morning last, shortly before ten o'clock, a swarm of bees issued from one of my hives. After remaining in the air for a few minutes, making the usual humming noise, they suddenly returned, clustering round the entrance of the hive for a little time before re-entering. The hive is not more than a third full of comb, and the stock is very small, being a late and weak cast. Can you assign any reason for this strange proceeding on the part of the bees? For some time after their return the noise within showed that they were still in a state of great excitement. I turned up the hive within a few minutes after their re-entrance, but could discover no cause for the unusual commotion.—*Joseph S. Baly; Warwick, October* 13, 1874.

[Will some apiarian correspondent kindly reply.—*Edward Newman.*]

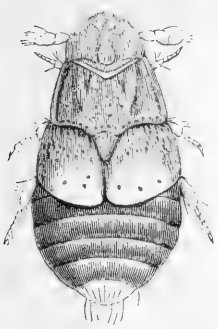
Cynips lignicola, Hart.—Six species of Synergus are known to inhabit the galls of this species, namely,—Melanopus, Hayneanus, Pallidipennis, Apicalis, Pallicornis, and Vulgaris: for a translation of Dr. Mayr's interesting note on its parasitism, see 'Entomologist,' vii. 55. Ceroptres arator has also been bred from the very small, stunted galls of Cynips lignicola. All the above inquilines pass the winter in the gall, emerging in the spring of the following year.—*E. A. Fitch; Downe Hall, Rayleigh, Essex.*

[I regret that this and the following note were not in time for insertion at p. 266.—*Edward Newman.*]

Cynips conglomerata.—Synergus melanopus, S. apicalis, S. pallicornis, and Ceroptres arator, are dependent on the galls of Conglomerata. Neither this nor the above species has been recorded as British.—*E. A. Fitch.*

An Epizoic Beetle.—Dr. Le Conte describes, in the 'Proceedings of the Zoological Society of London,' November 5th, 1872, a new family of Coleoptera, under the term Platypsyllidæ, founded on Platypsylla Castoris, made known by Ritsema, who discovered it on specimens of the American beaver in the Zoological Gardens of Amsterdam. A little later Prof. Westwood described it under the name of Platypsyllus castorinus, a singular coincidence as regards the scientific name. Ritsema regarded it as representing a

family of the Aphaniptera, equivalent in value to the Pulicidæ, *i.e.*, dipterous. Westwood thought it to be a type of a new order of insects, the Achreioptera. Dr. Le Conte,—and we are fortunate in having in our country one who easily leads the ranks of Coleopterists,—after a hasty examination, regarded the insect as coleopterous, a conclusion confirmed by further careful study, the results of which are presented in the beautiful paper before us. In this singular insect the body is long-oval, flattened, spiny on the exposed portions, resembling at first sight a minute cockroach, and of the same colour. The wing-covers are small, not longer than the prothorax, and the head is nearly semicircular; the eyes entirely wanting; the antennæ nine-jointed, clavate; the maxillæ large, with four-jointed palpi; the mentum large; the ligula broad; and the labial palpi short and three-jointed; while the labrum is peculiar. After comparing this beetle with those of other families, the author decides that 'the affinities of this insect are very composite, but all in the direction of the Adephagous and Clavicorn series, though chiefly with the latter. The most convenient position of the family will probably be between Hydrophilidæ and Leptinidæ as the families are now arranged, though its tendency to Trichopterygidæ and Corylophidæ is equally strongly manifested. It is, therefore, a very peculiar and extraordinary synthetic type, which is almost equally in and out of place in any linear arrangement of the series with which it is allied.' As this parasite occurs on our native beaver we hope our naturalists will be on the look-out for specimens, and carefully examine the fur of these animals for that purpose.—'*American Naturalist' for July*, 1874.



Platypsylla Castoris.

Answers to Correspondents.

John T. D. Llewelyn.—Bluebottles on Leaves.—For the last few days we have noticed the bluebottle-flies settle on rose, cabbage, pear, and other leaves. The flies there die,

and very shortly a fungus joins the body to the leaf. The enclosed specimens have been dead two or three days. The fungus apparently originates in the body of the fly. Would you kindly give it your attention, and let me know your opinion?

[I have nothing to add to the case so distinctly stated by Mr. Llewelyn, except that the same phenomenon has frequently been observed, and that no satisfactory explanation has been given. When flies are thus fixed on the surface of glass, there is an excellent opportunity for examining the fungus with a lens.—*Edward Newman.*]

Joseph Anderson, jun.—The insects are Pterochlorus longipes of Passerini, and probably also the Lachnus fasciatus of Burmeister. Kaltenbach found them feeding on the trunks of Pinus Strobus, or Weymouth pine; and Zetterstedt found them also on the spruce. They have a remarkably long rostrum, although perhaps not quite equal to that of Lachnus Roboris, constituting the genus Stomaphis of Walker. Mr. Buckton has examined the specimens, and has most kindly supplied this information.—*E. Newman.*

Mrs. Rawlinson.—The moth is probably a small specimen of the death's-head hawk moth, Acherontia Atropos.—*E. Newman.*

William Thomas.—I captured a specimen of a beetle on August 31st, on some palings, near this place, which exactly agrees with the plate given in the 'Annual' of Athous difformis: it uttered a kind of hissing sound when moved. It is the only example I have captured. The following is the colouring:—wings, legs and antennæ coppery brown, looking quite transparent when exposed to the sun; the antennæ seem to be kept constantly quivering; the thorax with two yellowish transverse bands above; it is woolly below, like willow-down: there are no other markings about the body. I think there can be no doubt as to the species.

[I must forbear to express an opinion. (2) The drawing is a very good representation of the larva of the dagger-moth, Acronycta Psi. (3) The beetle is Anchomenus prasinus, and is very common.—*Edward Newman.*]

James Hooper.—The creeping insects on the willow, whether winged or apterous, are a species of Aphis, or plant-louse. The black spots are caused by the dropping of a saccharine secretion from the Aphides: the bluebottles

congregate to feed on the sweets. All these nuisances will have disappeared with the first frost. All attempted remedies are inefficient.—*Edward Newman.*

Haggerston Entomological Society.—The Seventh Annual Exhibition was held at their rooms, 10, Brownlow Street, Dalston, on the evenings of November 12th and 13th, and was largely attended. Among the rarer species exhibited were—O. Lunaris, by Mr. J. Moore; D. Albimacula, from Folkestone, by Mr. Purday; L. Vitellina (taken at Glynde, near Lewes, September 30th, 1874), Z. Conformis, and hybrids between S. Ocellatus and S. Populi, by Mr. E. G. Meek; C. Fraxini, by Mr. Lepelley; L. Purpuraria, by Mr. Harper; M. Salicalis, S. Emortualis, D. Literalis, and a fine collection of knot-horns, by Mr. Machin; a new Coleophora (with larva-case), D. Obfuscata and C. Munitata, by Mr. Eedle. The following noteworthy varieties were shown:—V. Urticæ, by Messrs. Packman and Lepelley; A. Caja, by Messrs. Eedle and Packman; a splendid banded specimen of S. Certata, by Mr. Packman; C. Immanata, M. Schulziana, M. Rubiginata, A. Cardamines (with the fore wings only, and those of a peculiar shape), by Mr. Eedle; and last, but not least in importance, a specimen taken by Mr. Macqueen at light, in the New Forest, whose identity is doubtful, though the preponderance of opinion seemed to be in favour of M. Unangulata. The following species were also represented, generally rather commonly:—S. Chrysidiformis, L. Albipuncta, A. Cinerea, C. Gnaphalii, E. Venustula, C. Absynthii, C. Glabraria, M. Alternata, H. Asellus, S. Palealis, Staintoniana and Irriguana, C. Cosmophorana, &c. Five microscopes, which were placed in one of the rooms, were a constant source of amusement and instruction to many of the visitors. One of the objects, exhibited by Mr. Elisha,—a bouquet of flowers, composed of the scales of butterflies,—was much admired.—*Henry Bartlett; Secretary.*

West London Entomological Society.—The Second Annual Exhibition of this Society will take place in the church-room, adjoining St. Mark's Institute, George Street, Oxford Street (near Grosvenor Square), on December 3rd and 4th, 1874, between 6 and 11 P.M. The company of entomologists is solicited.—*E. W. Timms; Secretary.*

SUPPLEMENT, 1873.

An asterisk (*) prefixed to the specific name implies that the occurrence of such species in Britain requires to be confirmed.

ARGYNNIS, *Fab.*
*NIOBE.
Niobe, *Linn.*

EREBIA, *Bdv.*
EPIPHRON.
Epiphron, *Knock.* (1783).
Ocellis albo-punctatis).
Var. Cassiope, *Fab.* (1793).
Ocellis nigris cœcis).

MEDEA.
Medea, *W. V.* (1776).
Blandina, *Fab.* (1793).

CŒNONYMPHA, *H.-S.*
CHORTOBIUS, *Gn.*
DAVUS.
Davus, *Fab.*
Typhon, *Haw.*
Polydama, *Haw.*, var.
Var. Rothliebi, *Staud. Cat.*
Davus, *Haw.*
(Ocellis pluribus, majoribus).

LYCÆNA, *Bdv.*
BŒTICA.
Bœtica, *Linn.*

SESIA, *Fab.*
MUSCÆFORMIS.
Muscæformis, *View.* (1789).
Philanthiformis, *Lasp.*

PROCRIS, *Fab.*
INO, *Leach.*
GERYON.
Geryon, *Hub.*

ZYGÆNA, *Fab.*
EXULANS.
Exulans, *Hoch.*
Var. Vanadis, *Dalm.*
MELILOTI.
Meliloti, *Esp.*

SYNTOMIS, *Ill.*
*PHEGEA.
Phegea, *Linn.*

NACLIA, *Bdv.*
ANCILLA.
Ancilla, *Linn.*

NOLA, *Leach.*
CONFUSALIS.
Confusalis, *H.-S.*
Cristulalis, *Dup.*, *D. L.* (non *Hub.*)
ALBULALIS.
Albulalis, *Hub.*

LITHOSIA, *Fab.*
CANIOLA.
Caniola, *Hub.*
MOLYBDEOLA.
Molybdeola, *Gn.*
Sericea, *Greg.*
LURIDEOLA.
Luridcola, *Tr.*
Complanula, *Bdv.*, *D. L.*

DEPLANA.
♂ Deplana, *Esp.*
♀ Depressa, *Esp.*
Helvola, *Hub.*
Helveola, *Och.*, *D. L.*

CALLIMORPHA, *Lat.*
HERA.
Hera, *Linn.*

BOMBYX, *Linn.*
QUERCUS.
Quercus, *Linn.*
Callunæ, *Palmer*, *D. L.*

ROBORIS.
Roboris, *Schrank.*
Guillemotii, *Trimoulet.*
Quercus, *Hub.* 270; aberr.
Quercus, *D. L.*

ENNOMOS, *Tr.*
AUTUMNARIA.
Autumnaria, *Wernb.*
Alniaria, *W. V.*, *D. L.* (non *Linn.*)

ALNIARIA.
Alniaria, *Linn.*, *Don.*, *Haw.*
Canaria, *Hub.*
Tiliaria, *Bork.*, *D. L.*

NYSSIA, *Dup.*
*LAPPONARIA.
Lapponaria, *Bdv.*

BOARMIA, *Tr.*
PERFUMARIA.
Perfumaria, *Newm.*
Rhomboidaria, *var.* ?

ACIDALIA, *Tr.*
PEROCHRARIA.
Perochraria, *Fisch.*
INTERJECTARIA.
Interjectaria, *Bdv.*
Dilutaria, *Hub.* ?
Osseata, *Haw.*, *Steph.* (non *W. V.*)
STRIGARIA.
Strigaria, *Hub.*

APLASTA, *Hub.*
ONONARIA.
Ononaria, *Fuess.*

LYTHRIA, *Hub.*
PURPURARIA.
Purpuraria, *Linn.*

EUPITHECIA, *Curt.*
SUBFULVATA.
Subfulvata, *Haw.*
{ Oxydata, *Tr.*, var.
{ Cognata, *Steph.*
ISOGRAMMATA.
Isogrammata, *Tr.*
Haworthiata, *D. L.*
ARCEUTHATA.
Arceuthata, *Frey.*

VALERIANATA.
Valerianata, *Hub.*
Viminata, *D. L.*

TRISIGNARIA.
Trisignaria, *H.-S.*

CAMPANULATA.
Campanulata, *H.-S.*
Denotata, *Hub.* (teste *Hein.*)

LARICIATA.
Lariciata, *Frey.*

VIRGAUREATA.
Virgaureata, *Dbl.*
Pimpinellata, *Gn.* (non *Hub.*)

ALBIPUNCTATA.
Albipunctata, *Haw.*
Tripunctaria, *H.-S.*

FRAXINATA.
Fraxinata, *Crewe.*

MELANIPPE, *Dup.*
SOCIATA.
Sociata, *Bork.* (teste *Staud.*)
Biriviata, *D. L.*
Subtristata, *Haw.*

CIDARIA, *Tr.*
RETICULATA.
Reticulata, *W. V.*

EUBOLIA, *Dup.*
*MÆNIARIA.
Mæniaria, *Scop.*

LITHOSTEGE, *Hub.*
GRISEATA.
Griseata, *W. V.*, var. A., *Gn.*
Nivearia, *D. L.* (non *W. V.*)

CLOSTERA, *Steph.*
ANACHORETA.
Anachoreta, *W. V.*

BRYOPHILA, *Tr.*
ALGÆ.
Algæ, *Fab.*

LEUCANIA, *Och.*
LOREYI.
Loreyi, *Dup.*
EXTRANEA.
Extranea, *Gn.*
PUTRESCENS.
Putrescens, *Hub.*
*L-ALBUM.
L-album, *Linn.*
ALBIPUNCTA.
Albipuncta, *W. V.*

TAPINOSTOLA, *Led.*
BONDII.
Bondii, *Knaggs.*
? Extrema, *Hub.*

ELYMI.
Elymi, *Tr.*

NONAGRIA, *Tr.*
BREVILINEA.
Brevilinea, *Knaggs.*

LUPERINA, *Bdv.*
GUENÉEI.
Guenéei, *Dbl.*

PHOTEDES, *Led.*
CAPTIUNCULA.
Captiuncula, *Tr.*
Expolita, *Stain.*

HYDRILLA, *Bdv.*
PALUSTRIS.
Palustris, *Hub.*?

AGROTIS, *Och.*
HELVETINA.
Helvetina, *Bdv.*?

NOCTUA, *Gn.*
FLAMMATRA.
Flammatra, *W. V.*

TÆNIOCAMPA, *Gn.*
GOTHICA.
Gothica, *Linn.*
Var. Gothicina, *H.-S.*

DIANTHŒCIA, *Bdv.*
CAPSOPHILA.
Capsophila, *Bdv.*

IRREGULARIS.
Irregularis, *Hufn.*
Echii, *Bork.*

CÆSIA.
Cæsia, *W. V.*

BARRETTII.
Barrettii, *Dbl.*

POLIA, *Och.*
XANTHOMISTA.
Xanthomista, *Hub.*
Var. Nigrocincta, *Tr.*

XYLINA, *Och.*
FURCIFERA.
Furcifera, *Hufn.* (1767).
Conformis, *W. V.* (1776).

LAMBDA.
Lambda, *Fab.* (1787) (non *Haw.*)
Var. Zinckenii, *Tr.* (1826).

ACONTIA, *Tr.*
SOLARIS.
Solaris, *W. V.*
Var.? Albicollis, *Fab.*

MICRA, *Gn.*
*PAULA.
Paula, *Hub.*

PLUSIA, *Och.*
NI.
Ni, *Hub.*

*VERTICILLATA.
Verticillata, *Gn.*

TOXOCAMPA, *Gn.*
CRACCÆ.
Craccæ, *W. V.*

ACENTROPUS, *Curt.*
NIVEUS.
Niveus, *Olivier*?
Latipennis, *Mösch.*, var.

EBULEA, *Gn.*
CATALAUNALIS.
Catalaunalis, *Dup.*

MARGARODES, *Gn.*
UNIONALIS.
Unionalis, *Hub.*

LEMIODES, *Gn.*
PULVERALIS.
Pulveralis, *Hub.*

SCOPARIA, *Haw.*
BASISTRIGALIS.
Basistrigalis, *Knaggs.*

SCOTICA.
Scotica, *White.*
Cembralis, *var.*?

INGRATELLA.
Ingratella, *Zell.*

ZELLERI.
Zelleri, *Wocke.*

ULMELLA.
Ulmella, *Dale.*

CRAMBUS, *Fab.*
ALPINELLUS.
Alpinellus, *Hub.*

VERELLUS.
Verellus, *Zinck.*

MYELLUS.
Myellus, *Hub.*

FASCELINELLUS.
Fascelinellus, *Hub.*
Pedriolellus, *D. L.* (non *Dup.*)

EROMENE, *Dup.*
OCELLEA.
Ocellea, *Haw.*
Cyrilli, *Costa.*
Funiculellus, *Fr.*

MELISSOBLAPTES, *Zell.*
CEPHALONICA.
Cephalonica, *Sta.*

TRACHONITIS? *Zell.*
PRYERELLA.
Pryerella, *Vaughan.*

HOMÆOSOMA, *Curt.*
BINÆVELLA.
Binævella, *Hub.*
Eluviella, *Gn. MSS.*, *D. L.*

SENECIONIS.
Senecionis, *Vaughan* (præc. var.?)

SAXICOLA.
Saxicola, *Vaughan.*
Nimbella, *var.*?

PHYCIS, *Fab.*
OBDUCTELLA.
Obductella, *Fisch. v. R.*

DAVISELLA.
Davisella, *Newman.*
Albariella, *Knaggs* (non *Zell.*)

SUBORNATELLA.
Subornatella, *Zell.*
Serpylletorum, *Zell.*

ADORNATELLA.
Adornatella, *Dup.*, *Zell.*
Dilutella, *Hub.*? *Gn. Cat.*

EPHESTIA, *Gn.*
CINEROSELLA.
Cinerosella, *Zell.* (teste *Led.*)
Artemisiella, *Steph.*

TORTRIX, *Gn.*
PODANA.
Podana, *Scop.*
♂ Pyrastrana, *Hub.*, *D. L.*
Ameriana, *Tr.*
Rosana, *Steph.*
Germingiana, *Haw.*
♀ Congenerana, *Hub.*
Oporana, *Haw.*
Fuscana, *Steph.*, var.

DIVERSANA.
Diversana, *Hub.*
Accrana, *Haw.*
Transitana, *Gn.*, *D. L.*

*GNOMANA.
Gnomana, *Linn.*

FORSTERANA.
Forsterana, *Fab.*
Adjunctana, *Tr.*, *D. L.*

AMPHYSA, *Curt.*
PRODROMANA.
Prodromana, *Hub.*
Walkeri, *Curtis*, *D. L.*

LEPTOGRAMMA, *Curt.*
NIVEANA.
Niveana, *Fab.*
Treveriana, *Hub.*
Scotana, *Gn. MSS.*, var.

PERONEA, *Curt.*
SPONSANA.
Sponsana, *Fab.*
Favillaceana, *D. L.*
Reticulana, *Haw.*, var.
Tristana, *Haw.*, var.

LIPSIANA.
Lipsiana, *W. V.*

AUTUMNANA.
Autumnana, *Hub.*
Rufana, *W. V.* (non *Scop.*)

COMPARANA.
Comparana, *Hub.*
Schalleriana, *var.*?
Costimaculana, *Steph.*, var.

COMARIANA.
Comariana, *Zell.*
Proteana, *H.-S.*
Potentillana, *Cooke.*

DICTYOPTERYX, *Stph.*
LORQUINIANA.
Lorquiniana, *Dup.*
Uliginosana, *Bent.*, *D. L.*
Atrosignana, *H.-S.*

PENTHINA, *Tr.*
SORORCULANA.
Sororculana, *Zett.*
Prælongana, *Gn.*
Betulætana, *H.-S.*, 251.

DIMIDIANA.
Dimidiana, *Sodoff.*
Ochromelana, *Gn.*, *D. L.*
Atropunctana, *Zett.*
Weaverana, *Dale*, *MSS.*

STAINTONIANA.
Staintoniana, *Barrett.*

FULIGANA.
Fuligana, *Hub.*
Ustulana, *Haw.* (non *Hub.*)
Carbonana, *D. L.*

SPILONOTA, *Curt.*

LARICIANA.
Lariciana, *Zell.*

INCARNATANA.
Incarnatana, *Hub.*
Amœnana, *Hub., D. L.*

SERICORIS, *Tr.*

DOUBLEDAYANA.
Doubledayana, *Barrett.*

IRRIGUANA.
Irriguana, *Hub.*
Metallicana, *var.?*

MIXODIA, *Gn.*

RUBIGINOSANA.
Rubiginosana, *H.-S.*
Bouchardana, *D. L.*

CONSEQUANA.
Consequana, *H.-S.*
Hawkerana, *Stainton.*

EUCHROMIA, *Steph.*

MYGINDANA.
Mygindana, *W. V.*
Flammeana, *Fröl.*

RUFANA.
Rufana, *Scop.*

CNEPHASIA, *Curt.*

POLITANA.
Politana, *Haw.*
Lepidana, *Curt., D. L.*
Sylvana, *Tr.*
Pulchellana, *Haw.*, var.

SCIAPHILA, *Tr.*

CHRYSANTHEANA.
Chrysantheana, *Dup.*
Asinana, *Haw.* (non *Hub.*)
Alternana, *Gn.*
Alternella, *W. V.?*

WAHLBOMIANA.
Wahlbomiana, *Linn.*

PASIVANA.
Pasivana, *Hub.*
Sinuana, *Steph.*

ABRASANA.
Abrasana, *Dup.*

CAPUA, *Steph.*

FAVILLACEANA.
Favillaceana, *Hub.*
Ochraceana, *Steph., D. L.*
Vulgana, *Froel.*
Terreana, *Dup.*

PHOXOPTERYX, *Gn.*

INORNATANA.
Inornatana, *H.-S.*
Subarcuana, *Wilk.*

PALUDANA.
Paludana, *Barrett.*

LÆTANA.
Lætana, *Fab.*
Harpana, *Hub.*
Ramana, *D. L.* (non *Linn.*)

GRAPHOLITA, *Tr.*

RAMANA.
Ramella, *Linn.*
Paykulliana, *Fab., D. L.*
Sesquilunana, *Haw.*
Triquetrana, *Hub.*, var.
Costana, *Dup.*, var.

HYPERMECIA, *Gn.*

CRUCIANA.
Cruciana, *Linn.*
Excecana, *H.-S.*
Viminana, *Gn.*
Augustana, *D. L.* (non *Hub.*)

AUGUSTANA.
Angustana, *Hub.*

EPHIPPIPHORA, *Gn.*

PFLUGIANA.
♂ Pflugiana, *Fab.?, Haw.*
Novana, *Gn.*, var.?
♀ Sticticana, *Haw.*, var. *a.*
Scutulana, *D. L.* (non *W. V.*)

GRANDÆVANA.
Grandævana, *Zell.?*

POPULANA.
Populana, *Fab.*
Ephippana, *Hub.*

GALLICOLANA.
Gallicolana, *Zell.*

COCCYX, *Tr.*

RAVULANA.
Ravulana, *H.-S.*

ARGYRANA.
Argyrana, *Hub.*
Atromargana, *Haw.*
♀ Strobilella, *Steph.*
Vernana, *Knaggs*, var.?

NEMORIVAGANA.
Nemorivaga, *Tengs.*
Finitimana, *Gn. MSS.*
Tædana, *Linn.? D. L.*

PAMPLUSIA, *Gn.*

MERCURIANA.
Mercuriana, *Hub.*
Monticolana, *Mann.*
Alticolana, *Steph.*
Subsequana, *Steph.* (non *Haw.*)

ENDOPISA, *Gn.*

NIGRICANA.
Nigricana, *Fab.*
Tenebrosana, *Dup.?*
Nebritana, *D. L.* (non *Tr.*)
{ Proximana, *Haw.*, var.?
{ Pisana, *Gn.*

STIGMONOTA, *Gn.*

DORSANA.
Dorsana, *Fab.*
Lunulana, *W. V.*

OROBANA.
Orobana, *Tr.*

LEGUMINANA.
Leguminana, *Zell.*
Deflexana, *H.-S.*
♀ Interruptana, *D. L.* (non *H.-S.*)

COROLLANA.
Corollana, *Hub.*
Heegerana, *D. L.* (non *Hub.*)

GERMARANA.
Germarana, *Hub.*
Punctieostana, *Steph., D. L.*
Immaculana, *Gn.*

ROSETICOLANA.
Roseticolana, *Zell.*
Germarana, *Gn., D. L.* (non *Hub.*)

DICRORAMPHA, *Gn.*

PETIVERANA.
Petiverella, *Linn.*
Stelliferana, *Curt.*, var.
Flavidorsana, *Knaggs*, var.?

PLUMBANA.
Plumbana, *Scop.*
Ulicana, *Gn.*

HERBOSANA.
Herbosana, *Barrett.*

CATOPTRIA, *Gn.*

JULIANA.
Juliana, *Curt.*

NIMBANA.
Nimbana, *Fisch.*

ASPIDISCANA.
Aspidiscana, *Hub.*

MARITIMANA.
Maritimana, *Dale, MSS.*
Wimmerana, *Tr.? D. L.*

ÆMULANA.
Æmulana, *Schlg.*
Latiorana, *H.-S.*
Modestana, *Steph., D. L.* (non *H.-S.*)

CONTERMINANA.
Conterminana, *H.-S.*

HOHENWARTHIANA.
Hohenwarthiana, *W. V., H.-S., Gn.*
Scopoliana, *Haw.*

FULVANA.
Fulvana, *Steph., Wilk.*
Jaceana, *H.-S.*

CANA.
Cana, *Haw.*
Carduana, *Gn.*
Scopoliana, *Wilk., D. L.*
Hohenwarthiana, *Tr.?*

EUPŒCILIA, *Steph.*

PALLIDANA.
Pallidana, *Zell.*
Albicapitana, *Cooke, D. L.*

SODALIANA.
Sodaliana, *Haw.?*
Amandana, *H.-S.*

VECTISANA.
Vectisana, *Westw.*

GEYERIANA.
Geyeriana, *H.-S.*, præc. var.?

MANNIANA.
Manniana, *F. v. R.*
Luridana, *Gregson.*

CILIANA.
Ciliella, *Hub.*
Ruficiliana, *Haw.*
Rubellana, *Zell.*

DEGREYANA.
Degreyana, *McLach.*

IMPLICITANA.
Implicitana, *H.-S.*
Heydeniana, *H.-S.*, partim.

CHROSIS, *Gn.*

BIFASCIANA.
Bifasciana, *Hub.*
Audouinana, *Dup., D. L.*
Apicalis, *Westw.*

ARGYROLEPIA, *Steph.*

SUBBAUMANNIANA.
Subbaumanniana, *Wilk.*
Baumanniana, var.?

ZEPHYRANA.
Zephyrana, *Tr.*
Dubrisana, *Curt.* } gen. 1, teste
Virginana, *Gn.* } *Lederer.*
Maritimana, *Gn.*, gen. 2, teste *Led.*

COCHYLIS, *Tr.*
ALTERNANA.
Alternana, *Steph.*
Gigantana, *Gn., D. L.*

APHELIA, *Curt.*
OSSEANA.
Osseana, *Scop.*
Pratana, *Hub., D. L.*
Quadripunctana, *Haw.*
Cantiana, *Curt.*, var.

PSYCHE, *Bruand.*
CRASSIORELLA.
Crassiorella, *Bruand.*

BETULINA.
Betulina, *Zell.*
Anicanella, *Bruand.*

SOLENOBIA, *Zell.*
CONSPURCATELLA.
Conspurcatella, *Zell.*

DOUGLASII.
Douglasii, *Stn.*

TINEA, *Zell.*
RURICOLELLA.
Ruricolella, *Stn.*

DUBIELLA.
Dubiella, *Gregs.*

CONFUSELLA.
Confusella, *H.-S.*

INCURVARIA, *Haw.*
CANARIELLA.
Canariella, *Stn.*

MICROPTERYX, *Zell.*
FASTUOSELLA.
Fastuosella, *Zell.*

SWAMMERDAMIA, *St.*
NANIVORA.
Nanivora, *Stn.*

DEPRESSARIA, *Haw.*
CNICELLA.
Cnicella, *Tr.*

OLERELLA.
Olerella, *Zell.*

DISCIPUNCTELLA.
Discipunctella, *H.-S.*
Pastinacella, *Stn., D. L.*

GELECHIA, *Zell.*
MUSCOSELLA.
Muscosella, *Zell.*

INTAMINATELLA.
Intaminatella, *Stn.*

UMBROSELLA.
Umbrosella, *Zell.*

KNAGGSIELLA.
Knaggsiella, *Stn.*

MARMOREA.
Marmorea, *Haw.*

LATHYRI.
Lathyri. *Stn.*
Nigricostella, *Stn., D. L.*

OSSEELLA.
Osseella, *Stn.*

TARQUINIELLA.
Tarquiniella, *Stn.*

SANGIELLA.
Sangiella, *Stn.*

PINGUINELLA.
Pinguinella, *Tr.*

GRACILELLA.
Gracilella, *Stn.*

CONFINIS.
Confinis, *Stn.*

STRELITZIELLA.
Strelitziella, *H.-S.*

MACROCHILA, *Steph.*
USTULELLA.
Ustulella, *Fab.*

PANCALIA, *Stn.*
LATREILLELLA.
Latreillella, *Curt.*

ACROLEPIA, *Curt.*
MARCIDELLA.
Marcidella, *Curt.*

ARGYRESTHIA, *Stn.*
ÆRARIELLA.
Æraricella, *Stn.*

ZELLERIA, *Stn.*
SAXIFRAGÆ.
Saxifragæ, *Gn.*

GRACILARIA, *Zell.*
KOLLARIELLA.
Kollariella, *Zell.*

ALCHIMIELLA.
Alchimiella, *Scop.*
Swederella, *Thun., D. L.*

COLEOPHORA, *Zell.*
WILKINSONI.
Wilkinsoni, *Scott.*

FUSCOCUPRELLA.
Fuscocuprella, *Zell.*
Fuscociliella, *Stn.*

ARTEMISICOLELLA.
Artemisicolella, *Bruand.*
Albicans, *Stn., D. L.*

MELILOTELLA.
Melilotella, *Scott.*

ARDEÆPENNELLA.
Ardeæpennella, *Scott.*

ARTEMISIELLA.
Artemisiella, *Scott.*

BICOLORELLA.
Bicolorella, *Scott.*

GRAMINICOLELLA.
Graminicolella, *Stn.*

COSMOPTERYX, *Stn.*
ORICHALCELLA.
Orichalcella, *Stn.*

LAVERNA, *Stn.*
VINOLENTELLA.
Vinolentella, *H.-S.*

ELACHISTA, *Stn.*
PALUDUM.
Paludum, *Frey.*

DISPUNCTELLA.
Dispunctella, *Dup.*
Triseriatella, *Stn., D. L.*

TISCHERIA, *Zell.*
DODONÆA.
Dodonæa, *Stn.*

LITHOCOLLETIS, *Zell.*
INSIGNITELLA.
Insignitella, *Zell.*

OPOSTEGA, *Zell.*
SPATUTELLA.
Spatutella, *Gn.*

RELIQUELLA.
Reliquella, *Zell.*

BUCCULATRIX, *Zell.*
ARTEMISIELLA.
Artemisiella, *Wocke.*

CEMIOSTOMA, *Zell.*
OROBI.
Orobi, *Stn.*

LATHYRIFOLIELLA.
Lathyrifoliella, *Stn.*

NEPTICULA, *Zell.*
SORBI.
Sorbi, *Stn.*

ULMIVORA.
Ulmivora, *Frey.*

TILIÆ.
Tiliæ, *Frey.*

CENTIFOLIELLA.
Centifoliella, *Zell.*

APICELLA.
Apicella, *Stn.*

RUFICAPITELLA.
Ruficapitella, *Haw.*

MINUSCULELLA.
Minusculella, *H.-S.*

CASTANELLA.
Castanella, *Edleston.*

SPLENDIDISSIMELLA.
Splendidissimella, *H.-S.*

BOHEMANNIA, *Stn.*
QUADRIMACULELLA.
Quadrimaculella, *H.-S.*

PTEROPHORUS, *Lat.*
BERTRAMI.
Bertrami, *Roessl.*

TEUCRII.
Teucrii, *Greening.*

LÆTUS.
Lætus, *Zell.*

SEROTINUS.
Serotinus, *Zell.*
Bipunctidactylus, *Haw., D. L.*

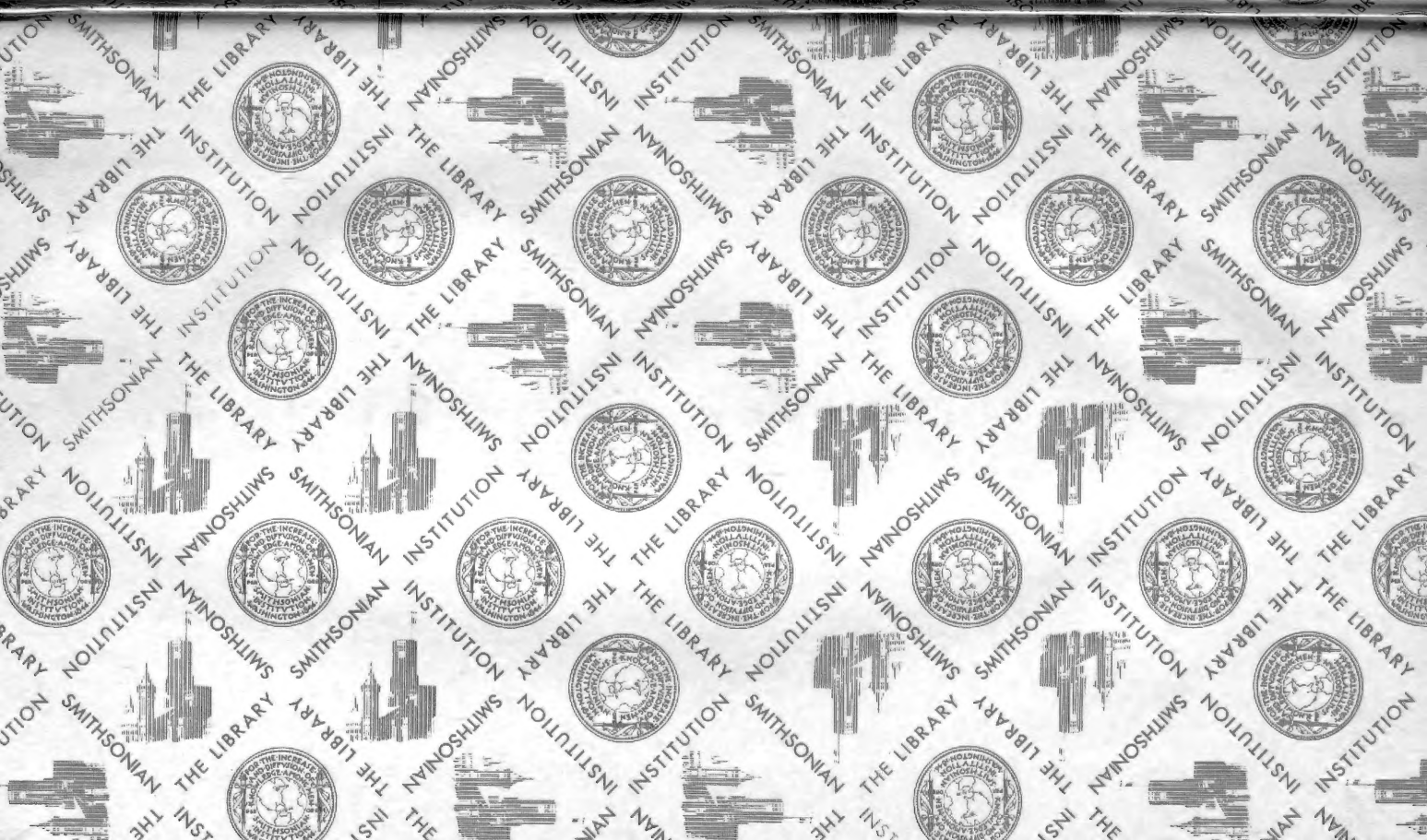
ZOPHODACTYLUS.
Zophodactylus, *Dup.*
Loweii, *Zell.*

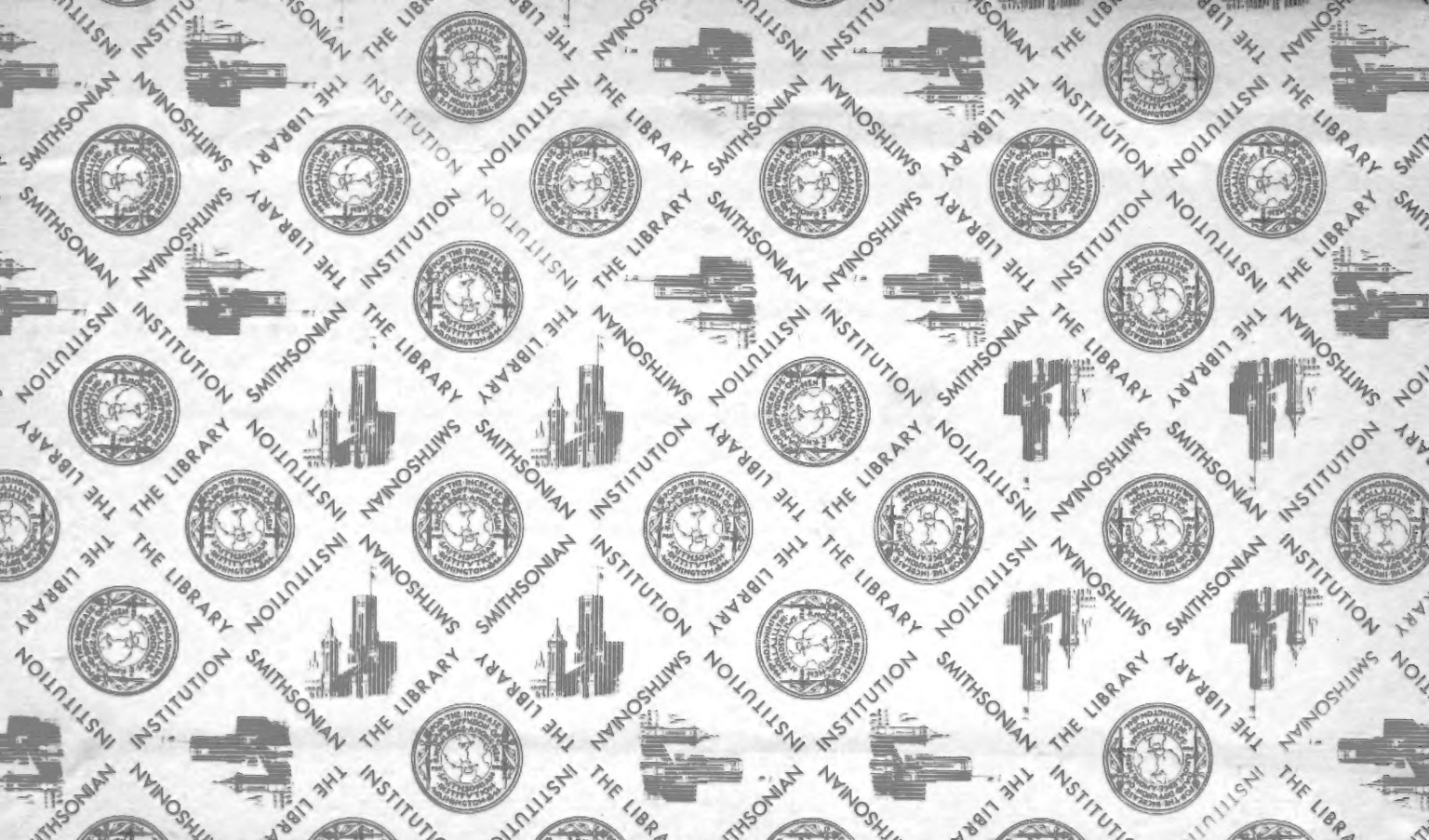
HODGKINSONI.
Hodgkinsoni, *Gregs.*
Zophodactylus, *var.*?

ARIDUS.
Aridus, *Zell.*?

PTERODACTYLUS.
Pterodactylus, *Linn.*
Fuscus, *Retz.*
Fuscodactylus, *D. L.*

MONODACTYLUS.
Monodactylus, *Linn.*
Pterodactylus, *Haw., D. L.*


SMITHSONIAN INSTITUTION
THE LIBRARY


SMITHSONIAN INSTITUTION
THE LIBRARY