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"The advantages attending the division of labour reach their maximum when not only individuals devote themselves chiefly to one object, but associate together for the purpose of promoting and extending it. * * * To a thorough conviction of this truth the Entomological Society of London owes its existence." ("Introduction" to vol. i of the Transactions of the Entomological Society of London, *the "organization" of which Society was effected on May 3rd, 1833.*)

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Entomologist's Monthly Magazine

VOLUME XIX.

THE INFLUENCE OF METEOROLOGICAL CONDITIONS ON INSECT LIFE.

BY CHARLES G. BARRETT.

The means employed by nature to keep species within due bounds—checking their inordinate increase or unnecessary decrease—are so certain and reliable in their results, and yet so obscure and difficult to trace in their modes of action, that almost any observations, however slight, which seem to be reliable as data from which to ascertain these means, are interesting and worthy of being put on record.

In every district and every climate there are evidently many species so peculiarly fitted to it that none of the periodical changes of weather and temperature materially affect their numbers, and from *these* little evidence can be obtained. It is from those species which only casually and rarely extend themselves from their natural homes into climates unsuitable for them, or from those which are always to be found in a given locality, but sometimes rarely, and always varying in numbers, that the most satisfactory evidence must be expected.

In the first class of cases an example occurred to me a few years ago which seems very much to the point. A friend, a well-known entomologist, being in the South of France and seeing with delight the lovely *Deiopeia pulchella* flying about, captured some, secured eggs, and sent them to a friend in England, who, by great care and assiduity, reared some of them to maturity and again obtained fertile eggs. A few of these he sent to me. They duly hatched, and as it did not seem very likely that any chance of observing native larvæ would ever occur to me, I regarded them with great interest. They were supplied with several species of *Myosotis*, but only about half a dozen of them seemed to possess sufficient vitality to feed, and as these evidently preferred *Myosotis palustris*, I potted some plants and kept them growing in a sunny window, where the young larvæ, covered with gauze, made themselves tolerably comfortable and grew rapidly, feeding with especial eagerness when the sun was shining on them. The weather happened to be fine and the sun hot for two or three

weeks just at that time, and one larva made such progress that in a fortnight it was full-fed, when it spun a very slight cocoon on the gauze and turned safely to pupa. By this time two more larvæ were full-fed and left the food-plant for the gauze, the rest being fully half grown, when a change of weather came, with wind, heavy rain, and a total absence of sunshine. The larvæ were, of course, not exposed to the rain, but the effect of the change was that those full-fed made no attempt to spin up, and the rest ceased to feed, and in a few days they all fell off the gauze or the plants, dead. After a fortnight of wet weather it cleared up and the one pupa produced the moth—a male.

This seems to supply a key to the whole history of the eccentric casual appearances of this and many other inhabitants of warmer climates on our shores. In obedience to some singular instinct that impels insects when becoming too numerous in their natural homes to emigrate to “fresh fields and pastures new,” they, contrary to their ordinary habits, cross land or sea, arriving, of course, very often in some inhospitable clime, where—if not at once captured and made native specimens of—they very likely soon fall victims to some pitiless storm of wind and rain. But supposing both these risks to be avoided, the moth—if an impregnated female—in due course lays its eggs, which most probably hatch, and the young larvæ are left—like Mark Twain—“friendless orphans in a foreign land.” If the temperature happens to be lower or the weather wetter than the natural constitution of the species is able to endure, the difficulty is settled at once—the young larvæ die without even attempting to feed, but if matters are more favourable, the strongest of them struggle along, and if fairly favoured by the weather a few of them may reach the perfect state; if quite unusually favoured by the weather a large proportion of them may do so, producing those remarkable instances of the sudden appearance in numbers of a species usually rare. Such good fortune rarely extends to a second season and the species becomes a rarity again or is even probably exterminated here, to be renewed at some future time by the same instinct of migration. In cases such as these it appears to me that sunshine means life, and its absence destruction, to the larvæ, and that by this simple and obvious influence the extension of species beyond their assigned limits is practically prohibited.

It also happens sometimes that the immigrant, following instinctively its inherited habit, attempts to produce *an additional brood* in the year, over what the climate will allow.

For instance, from the second brood of *Colias Edusa* which was so abundant in 1877, eggs were obtained, and the larvæ fed up and turned to pupæ, but, as far as I can ascertain, none emerged. My old friend, Mr. Birchall, wrote me that all his pupæ *showed the yellow colour of the wings in December* and then died. This colour of the wings, as we all know, only shows itself when the insect is nearly ready to emerge, and these *Edusa* pupæ following inherited habit *tried* to emerge in the winter, so as to hibernate, as they are well known to do in the *perfect* state, but from insufficient warmth and sunshine were unable to muster sufficient strength.

Again, in 1880, there was a wonderful immigration of *Vanessa cardui*, the usual numbers in this district, as in others, being enormously re-inforced by—evidently—a portion of the vast army that migrated across Europe. Very late that autumn the Rev. Clennell Wilkinson, of Castlemartin, Pembroke, found, to his great surprise, that larvæ of *V. cardui* were tolerably common on the thistles on the warrens near his residence. All the *tall* thistles were dead, and these larvæ were feeding, at the beginning of October, on the young plants close to the ground, making their nests among the radical leaves. Some of these larvæ he took home, and, by great care, two of them entered the pupa-state, October 17th and 20th, and one emerged (indoors) November 26th of the same year, 1879. The rest died. This failure of instinct on the part of the immigrants surely explains, in some degree, the fact that last year the insect was more than usually scarce, hardly any appearing to have hibernated, and also why an insect with such a power of increase in a suitable climate is so uncertain and variable in its appearances in one that is unfavourable.

With reference to the second class of cases—those in which a species always present is periodically common or scarce—much has been written, excessive *rain* being usually assigned as the cause of diminution in numbers, sunshine as the cause of increase. Without doubt these causes act to a very large extent, large numbers of larvæ being actually *drowned* by continued heavy rain, and others rendered liable to disease, but a little evidence has come under my notice, pointing so distinctly to another influence of equal potency, that I think it well worth recording in detail.

It may be within the memory of some readers that at the end of the first season that I was here at Pembroke (1875), I contributed to this Magazine some notes on Pembrokeshire insects, in which I relieved my soul by a vigorous grumble at the (entomological) barrenness of the land. It appeared that although in the preceding winter

there had been in England and Scotland severe cold and remarkably heavy snow, and though *snow* had fallen heavily here also, the winter had been in this district comparatively mild, the snow disappearing almost immediately, and that, in fact, for many years before, there had been little or no intense cold in Pembrokeshire. This mildness of weather continued through the three subsequent winters, there really was *no* hard frost, and snow was only occasionally seen on the hills. The predominance through each winter of winds from the south-east, south, west, and especially the south-west, all coming off a sea kept constantly warm by the gulf-stream, the water of which not only flows with each tide up the Bristol Channel, but also through the heart of the county by means of the windings of Milford Haven, fully explains this, and caused at that time a mildness of temperature probably unequalled in these Islands, except on the south coast of Devon and Cornwall. In many places fuchsias standing out of doors had never been cut down by frost within the memory of the inhabitants. Some of them were trees standing from fifteen to twenty feet high, with trunks of the size of a man's leg. One in the garden at Wallaston farm (thought nothing of by its owner) stood by the path where every one walked under it, its lowest branches being barely within reach of a tall man. The handsome shrubby *Veronicas*, usually greenhouse plants, had grown in the cottage gardens into great bushes five or six feet high, their abundant blossoms at the end of autumn affording the latest attraction to the *Vanessæ* before retiring to their winter quarters. Myrtles had actually grown old and ugly out of doors, sumachs of many years' growth stood in gardens, and it seemed that, but for the hoar frosts of October and November, the *Tropæolums* and *Pelargoniums* would have blossomed all the year round.

During these years, very many insects of general distribution in the United Kingdom, continued to be either very scarce, or confined to exceedingly restricted localities in this district. Of *Argynnis Paphia* only one or two specimens were seen in each season; *Argynnis Aglaia* was found only in two or three favourite spots in the wildest of the coast sandhills; of *Argynnis Euphrosyne* a very few specimens were seen in Canaston Wood, and one on the flank of Prescelly Mountain; while *Argynnis Selene* was scarcely to be found at all, except on a favoured slope of one of the more accessible sea-cliffs. *Satyrus hyperanthus* was also very local and uncommon, and *Satyrus Ægeria* only very sparingly to be seen. *Lycæna Ægon* must have existed somewhere, but was not observed in those years at all. Of *Bombyx neustria* I observed each year only a few nests on blackthorn

in one or two favourite localities; the larvæ of *Bombyx quercus* and *rubi* were scarce, and those of *Odonestis potatoria* so uncommon, that it was difficult to find a dozen, to be reared for the sake of occasional chocolate coloured varieties. *Emmelesia affinitata* occurred almost as a rarity, and I searched long and carefully before I could find its larva for Mr. Buckler to figure. *Noctuæ* (except a few universally abundant species) appeared to be almost absent; such a dearth of ordinary night-flying species I never knew anywhere before.

But in the winter of 1878, there was a great change. Persistent north or north-east winds, intensely cold, froze everything up hard, the warm sea air was completely expelled, or if a slight change of wind permitted a few clouds to come over, the rain from them was instantly converted into ice, with which the high roads were coated to a thickness of three or four inches, for weeks. Horses properly "roughed" travelled well enough, the rough points cutting into the ice, which did not wear them down; but vehicles had a bad time. Heavily laden waggons brought to a turning down a hill declined to follow the horses in taking a proper sweep, but *went first*, and the wheels of lighter vehicles *skated* rather than turned round, with the sound and action of sleigh-runners.

The winters of 1879 and 1880 were equally cold, indeed, the latter was said to be the coldest known here for fifty years, even the sea sands along the tide line were covered ankle deep with ice and frozen snow, a sight very rarely seen on this coast. The first of these three winters killed all the shrubby *Veronicas* and some of the sumachs, and the tree fuchsias and myrtles above the ground.

And now I will give the results as regards insects.

In 1879 *Argynnis Paphia* began to be visible in every woodland; in 1880 it had become plentiful, and was even to be seen along the roads; in 1881 it abounded, and specimens actually flew about the town, in the gardens, and settled on the sunny fronts of the houses. *A. Aglaia* first increased in numbers in its pet localities, then spread along the coast, till, in 1881, it could be found in scores or hundreds in places where previously not a specimen had been seen. *A. Euphrosyne* became common in the woods, and at last began to fly about the country lanes, and *A. Selene* became abundant all over the country, flying about every little strip of marsh and wet land by the road sides. The same was the case with *Satyrus hyperanthus*, and *S. Ægeria* became common everywhere, while *Lycæna Ægon* flew about the heathy hills along the coast in plenty. *Zygæna filipendulæ*, which had been local and not common, rapidly became abundant, the larvæ conspicuously

so ; the nests of *Bombyx neustria* were to be found in scores on hawthorn and blackthorn bushes ; *B. rubi* and *quercus* became plentiful, and *Odonestis potatoaria* so abundant, that the larvæ could easily be collected in hundreds, where hardly one could be seen before, and even the empty cocoons were conspicuously numerous on the hedge-banks in the winter. *Emmelesia affinitata* became a common insect, and many other *Geometræ* turned up which had hardly been seen before.

But in *Noctuæ* the improvement was the most remarkable, as in that group the scarcity had been most marked.

Aplecta herbida and *Hadena thalassina* appeared close to the town ; *Xylophasia hepatica* and *Apamea gemina* (both richly variable), *Miana fasciuncula*, *Grammesia trilinea*, *Noctua c-nigrum* and *festiva*, *Aplecta nebulosa*, *Hadena dentina*, and *Glæa spadicea*, all became abundant ; *Thyatira derasa* and *batis*, *Acronycta ligustri* and *megacephala*, *Leucania comma*, *Rusina tenebrosa*, and *Noctua triangulum*, turned up more or less freely ; *Triphæna janthina* came commonly into the gardens, and *Leucania littoralis* on the sand hills, and *Heliodes arbuti* in the meadows, both increased greatly in numbers. These, to be sure, are not remarkable species to obtain, the wonder was that they should have been previously rare or apparently absent. Other and scarcer species were also secured, but I am now referring to captures in home localities, which had been worked from year to year. Another species which wonderfully increased in numbers was *Pyrausta ostrinalis*, which actually swarmed last year.

Here we seem to have a direct example of cause and effect, but I am not prepared to say that the effect always arises in the same way. I think there can be no doubt that in the case of those insects whose mode of life includes the capacity for hibernation, their constitution is greatly strengthened and their chance of arriving at maturity increased, if the cold of winter is sufficiently severe to induce *complete* torpidity, undisturbed by warm and spring-like weather at unseasonable times, and this may account for the vast increase in numbers in species which, like *Bombyx neustria*, hibernate in the egg state ; it also probably has a strengthening effect on those which, like the species of *Argynnis* already mentioned, pass the winter as small social larvæ under a silken tent on the ground, or which, like the *Noctuæ*, hibernate in the larva state on the ground or among dead leaves, and are tempted out to feed by every warm and genial evening.

On the other hand, there can be no doubt that mild winters act *directly* to cause the destruction of both hibernating larvæ and pupæ, in two ways. One is by encouraging the growth of mould, which we

know attacks them as soon as, from excess of rain or humidity, they become sickly ; the other by permitting the continued activity of predaceous creatures. These are very numerous. Moles continue at work in mild winters, instead of burying themselves deep in the ground ; and mice are constantly active. These small mammalia destroy great numbers of Lepidopterous pupæ, and they abound in this district, as also do birds during the winter in an extraordinary degree. As soon as severe cold sets in to the north and east, the birds come down in swarms to the open fields and sheltered hill sides of this district, and it is hardly necessary to point them out as most industrious and persevering destroyers of larvæ. Predaceous beetles and earwigs are generally on the alert all through very mild winters, and although they probably do not eat *much* at that time, and, indeed, are not very plentiful in Pembrokeshire, they *must* destroy many larvæ and pupæ, having little else to subsist upon. But I believe that the mischief done by all these added together does not equal that done by the *Onisci*.

During mild winters these crustaceous vermin increase and multiply, and feed, and grow without check, till in so mild a climate they become a perfect nuisance, pervading everything indoors and out. It was hardly possible to keep them even out of the breeding cages, where they would get introduced when very small and unnoticed—or perhaps in the egg-state—hunt out and destroy every larva and pupa, and grow large and plump without ever showing themselves above the leaves and rubbish. Doubtless, their industry out of doors was in the same proportion, and my impression is that they approached very near to completely exterminating many species that would naturally be common here. Severe cold seems to destroy some of them, for they are not nearly so numerous now, and it certainly puts a complete stop to their destructive operations during a time when larvæ are most especially helpless and liable to attack. To this, with other causes already mentioned, I am inclined to attribute the extraordinary increase in numbers of so many species during the last three seasons, divided by severe winters. The winter now past has been mild, and, therefore, a further progressive increase cannot reasonably be expected ; but I hope that the mischief done in one mild winter may not be serious. It is the progressive increase of destroyers with the decrease of victims through successive mild seasons that is really to be dreaded.

As a slight corroboration of this view, I may mention, that while this district of country is comparatively poor in all the species of

which the larvæ feed and hibernate in any exposed situation, several species of *Noctuæ*, of which the larvæ live underground, are always abundant, and the country is actually rather *rich* in those species of *Tortricina* which feed and hibernate entirely within the stalks or roots of plants.

It is worthy of notice, that there are a very few species which have appeared unable to cope with severe cold. *Lobophora viretata* was tolerably common here during the first three or four years of which I have been writing, but after the first *cold* winter it became scarce, and has since almost disappeared. Its favourite locality was turned into a school playground and destroyed, but the decrease is also observable in the casual specimens which used to be found sitting on the fronts of houses, windows, gates and elsewhere all around the neighbourhood, of which hardly one occurred last year. *Diasemia literalis* has also been scarce for the last three years, but I have no great fear that it is dying out, since we have found casual specimens in two fresh localities.

Pembroke: 10th April, 1882.

NOTES ON THE NEUROPTERA OF STRATHGLASS, INVERNESS-SHIRE.

BY J. J. KING.

Having spent July and August of 1880 in a locality, to the Neuropterous fauna of which, very little attention has been paid, it has been suggested to me that I should make out a detailed list of my captures for this Magazine.

Strathglass is situated to the north of Loch Ness, being parallel with it; the Strath proper commences about nine miles from Beauly, and continues for about ten miles across the country in a south-westerly direction. It is for the most part about three-quarters of a mile broad; from south-west to north-east it descends in a series of terraces, which are almost level, these terraces are covered with small water-worn boulders, all which suggest to one the idea of its having been once the bed of a large lake; this idea is further borne out when the falls of Kilmorack are visited, the rocks at this place having the appearance of being wrenched asunder and hurled into the valley below, as if the pressure of the water above had been too much for them.

The Strath is very warm, the hills rising on either side rather abruptly to a considerable height, help to shelter it. The river

Glass, which has its source near Ben Attow, close to the west coast of Scotland, flows through it in a somewhat deep channel, and discharges itself in the Beaully firth. About seventeen miles from Beaully the Cannich joins the Glass; this place, where there is a small village containing a good hotel, I made my head quarters. Invercannich is, in fact, the centre of the district, all the churches are situated near here, and on Sundays it is quite a busy place, the people having to come in some cases upwards of twenty miles to get to church or obtain a glass of the national beverage.

This is one of the best localities I have ever visited for *Neuroptera*, more particularly *Trichoptera*, as water is plentiful in many conditions. A swift deep river (the Glass) traverses the Strath; then we have the Cannich, passing over many falls in its course before it reaches the Glass, which makes it very suitable for certain species of caddisflies; burns of all sizes abound, while Lochs and "lochans" are too numerous to mention, these latter occurring at all heights on the surrounding hills, and as for ditches and marshy ground, the difficulty is to keep clear of them.

During the two months I staid in the district, little or no rain fell, but during the night a heavy fall of dew took place. In the day time the heat of the sun's rays made it almost impossible to undertake any long excursion, hence most of my collecting took place not far from Invercannich.

TRICHOPTERA.

Upwards of two-fifths of the British species of this group were taken.

Phryganea striata, L., a few odd specimens occurred in various localities. *P. obsoleta*, Hag., was the common species of the district, at no Loch or Lochan was it absent; I have had as many as a dozen in my net at one time while sweeping. In Glen Cannich, at a small peat-hole during an exceedingly warm day, I observed a very light coloured ♀ of this species thrice descend about eighteen inches into the water, using a reed to walk on, no doubt it was in the act of oviposition, it evidently came to the surface of the water to get air, as in each case it merely came to the water's level, turned round, and deliberately walked down again; each time, I should think, it stopped down about one minute and a half; the insect seemed strange to me, and I could not resist the temptation to catch it when it made its appearance on the surface the third time.

Glyptotælius pellucidus, Oliv., occurred at many of the Lochs, but was not common.

The genus *Limnophilus* was well represented, fifteen out of the twenty-four British species being captured.

Limnophilus rhombicus, L., common. *L. borealis*, Zett., three specimens turned up at different Lochs. *L. marmoratus*, Curt., common everywhere. *L. stigma*, Curt., rare. *L. lunatus*, Curt., abundant at all levels. *L. ignavus*, Hag., one speci-

men. *L. centralis*, Curt., very common. *L. vittatus*, Fab., equally common with the last. *L. affinis*, Curt., rare. *L. auricula*, Curt., frequent. *L. griseus*, L., some nice varieties of this common species were taken. *L. extricatus*, McL., one specimen. *L. luridus*, Curt., a few specimens were taken. *L. hirsutus*, Pict., one specimen. *L. sparsus*, Curt., occurred in swarms, some well-marked forms were taken.

Anabolia nervosa, Curt., common.

Stenophylax stellatus, Curt., very common along the banks of the Glass.

Micropterna sequax, McL., rare.

Halesus radiatus, Curt., common. *H. auricollis*, Pict.; the ♂ of this species was abundant during the last week of August, a few ♀s were taken in the beginning of September.

Sericostoma personatum, Spence, was frequent.

Silo pallipes, Fab., not uncommon.

Cruncæcia irrorata, Curt., a number were taken along with the following species.

Lepidostoma hirtum, Fab., very common on all the streams.

Beræa maurus, Curt., occurred sparingly on some of the burns.

Molanna palpata, McL., was one of the commonest species at all the Lochs; the semi-transparent ♀ is very different from the ♂.

Odontocerum albicorne, Scop., was common.

Leptocerus fulvus, Ramb.; a number were captured on the banks of the Glass by beating the bushes. *L. alboguttatus*, Hag.; a few specimens were taken with the last. *L. aterrimus*, Steph.; both the black and brown varieties were very common at all the Lochs, more particularly those above Tomich. *L. cinereus*, Curt., almost as common as the last. *L. albifrons*, L., very common along the Glass. *L. bilineatus*, L., in clouds around the Lochs above Tomich and elsewhere.

Mystacides nigra, L., *M. azurea*, L., and *M. longicornis*, L., all three species were common about the Lochs.

Trienodes bicolor, Curt., in numbers on the Lochs above Tomich.

Æcetis ochracea, Curt., and *Æ. lacustris*, Pict., turned up occasionally at various Lochs.

Hydropsyche instabilis, Curt., very common everywhere.

Philopotamus montanus, Don., in considerable numbers along the Cannich; one specimen of the *var. scoticus* was taken.

Wormaldia mediana, McL., two specimens occurred with the next species. *W. subnigra*, McL., the Cannich produced this species in abundance towards the end of August.

Plectrocnemia conspersa, Curt., rare.

Polycentropus flavomaculatus, Pict., was common along the Glass and Cannich. *P. Kingi*, McL., was taken along with *flavomaculatus*; it was described in the Ent. Mo. Mag., vol. xvii, p. 254.

Holocentropus dubius, Ramb., rare.

Cyrtus trimaculatus, Curt., very common everywhere.

Tinodes Wæneri, F., by no means rare.

Psychomyia pusilla, L., abundant.

Chimarra marginata, L.; this beautiful species was very common on the moss-covered stones along the banks of the Cannich.

Rhyacophila dorsalis, Curt., was always turning up where it was neither expected nor wanted.

Glossosoma Boltoni, Curt.; a few specimens were taken. *G. vernale*, Pict., was very common.

Agapetus fuscipes, Curt., and *A. comatus*, Pict., were both abundant.

Hydroptila sparsa, Curt., very common on all the streams. *H. forcipata*, Eaton, also common.

Ithytrichia lamellaris, Eatou, common.

Orthotrichia angustella, McL., a few specimens were taken.

NEUROPTERA-PLANIPENNIA.

Sialis lutaria, L., common. *S. fuliginosa*, Pict., also common; I took one specimen which measures nearly one inch and a half across the wings, on a burn near Corriemony.

Sisyra fuscata, Fab., frequent.

Micromus paganus, L., very common.

Hemerobius marginatus, Ste., very common in Glen Affrick. *H. limbatus*, Wesm., common. *H. nervosus*, Fab., not uncommon. *H. subnebulosus*, Ste., odd specimens occurred.

Chrysopa flava, Scop., common. *Ch. vittata*, Wesm., common.

Coniopteryx tineiformis, Curt., occurred commonly by beating alder bushes, &c., growing near small burns. *C. aleyrodiformis*, Ste., taken with the last species.

Panorpa germanica, L., common, by sweeping rank herbage, &c.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Atropos divinatoria, Müll., in the house.

Clothilla pulsatoria, L., unfortunately rather common in the house.

Psocus sexpunctatus, L., a few taken. *P. bifasciatus*, Latr., common everywhere.

Stenopsocus cruciatus, L., very common in oaks.

Cæcilius flavidus, Ste., very common in all stages; this species varied considerably in the arrangement of the wing-veins. *C. vittatus*, Latr., not uncommon.

Elipsocus unipunctatus, Müll., very common. *E. Westwoodi*, McL., very common. *E. hyalinus*, Ste., abundant. *E. flaviceps*, Ste., equally common with the last. *E.* — *sp.* ?, allied to *cyanops*, but larger, &c.

EPHEMERIDÆ.

Leptophlebia marginata, L., very common. *L.* — *sp. nov.* ?

Ephemerella ignita, Poda, occurred in clouds during the afternoon in August.

Cloëon simile, Eaton, common.

Baëtis rhodani, Pict., in swarms. *B. pumilus*, Burm., with the last.

Siphylurus lacustris, Eaton, rare.

Rhithrogena semicolorata, Curt., very common. *R.* — *sp.*?, *R.* — *sp.*?, *R.* — *sp.*?, these three forms may only be varieties of *semicolorata*, but they differ very considerably from that species, but owing to not having specimens preserved in fluid, they cannot satisfactorily be made out.

Heptagenia elegans, Curt., common. *H. longicauda*, Ste., everywhere. *H. lateralis*, Curt., a few were taken.

ODONATA.

Leucorrhinia dubia, Van d. Lind., one specimen was taken in Glen Cannich.

Sympetrum striolatum, Charp., common. *S. scoticum*, Don., abundant in Glen Cannich.

Libellula quadrimaculata, L., near most of the Lochs.

Cordulia metallica, Van d. Lind.; a few specimens were taken after much hard work. *C. arctica*, Zett.; I have a specimen of this species in my cabinet taken by Dr. Buchanan White, many years ago in Strathglass, but I was not fortunate in observing the species myself, although Dr. White gave me all the assistance he could.

Cordulegaster annulatus, Latr., in many localities.

Æschna juncea, Müll., abundant in all the Glens.

Pyrrhosoma minimum, Hans., a perfect pest at all the Lochs.

Agrion cyathigerum, Charp., equally common with the last species.

This gives as the result of my trip 111 species, or, excluding the four doubtful species of *Ephemeridæ*, 107, more than half this number being taken up with the *Trichoptera*, namely, 63; the *Neuroptera-Planipennia* absorbing 13; leaving the remainder for the *Pseudo-Neuroptera*.

In conclusion, I have only to acknowledge the kindness with which my friend Mr. McLachlan has unravelled many of the more knotty points among the *Trichoptera*, and the assistance I have received from the Rev. A. E. Eaton when working at the *Ephemeridæ*.

207, Sauchiehall Street, Glasgow :

April, 1882.

THE TARSAL AND ANTENNAL CHARACTERS OF *PSOCIDÆ*.

BY PROF. H. A. HAGEN.

By a mere chance I see that a statement recently published by me concerning the tarsal structure of *Psocidæ* confirms, in a most satisfactory manner, that made by Prof. Westwood in 1857 (Proc. Ent. Soc. Lond., series 2, vol. iv, pp. 63, 64) regarding certain *Coleoptera*.

Being occupied with the *Atropina*, I was astonished to find that the young forms have only two-jointed tarsi (instead of three-jointed, as is found in the imago), but the last joint, internally, in the middle, shows a more or less visible division, where the 3rd joint (the median)

will be formed, and just below it are one or two small bristles. I have observed this in *A. divinatoria* (reared by myself), *succinica*, and *oleagina*, and also in *Hyperetes tessellatus*. So long as the young have only two-jointed tarsi, the antennæ have also less joints. Thus, in *A. divinatoria* the latter have only 12 instead of the 15 of the imago; in *Hyperetes* the proportions are 13 to 23. But, although the third (middle) joint of the tarsi is produced by a division of the apical, it is just the contrary with the antennæ. In these the two thick basal joints, and the apical joint, are not divided; but in some species all the intermediate joints are so. *Hyperetes* is in the latter case, all the 10 intermediate joints being divided in the imago, as I can show from preparations. It is a remarkable fact that the mysterious *Hyperetes* shows, in its earlier stages, precisely the normal number (13) of joints for the *Psocidæ*. I am not prepared to give an opinion as to this genus. Other genera, such as *Cacilius*, commonly considered to have only two-jointed tarsi, possess a small aborted third joint, just as occurs in many *Coleoptera*.

Cambridge, Mass.:

1st April, 1882.

FOOD-PLANTS AND TIMES OF APPEARANCE OF THE SPECIES OF
PSYLLIDÆ FOUND IN GREAT BRITAIN, TOGETHER WITH
OTHERS WHICH MAY BE EXPECTED TO OCCUR HERE.

BY JOHN SCOTT.

The publication of the synonymic list (vol. xviii, p. 253) corrected, as far as I possibly could, to that time, naturally led me to think of giving, in a collected and comprehensive form, as complete information as possible of the food-plant of each of the species, together with the time when the latter may be looked for; and, although they may be found a little earlier or later than the time here indicated, yet this shows when they were actually taken. But very little is still known of the earlier stages of many of these insects, of others nothing whatever, and the solution of this problem in any one of these cases I consider to be of much greater importance than the capture of the perfect insect itself. I have already, in vol. xvii (p. 132), explained my mode of rearing them, and how easy this is to be done, so that I need not repeat it. For the purpose of keeping this table as simple as possible, I have only used the old and well-known generic names; the recent sub-divisions being given in the list above referred to.

NAME.	FOOD-PLANT.	DATE OF APPEARANCE
LIVIA <i>juncorum</i> , Latr.	<i>Juncus conglomeratus</i> , Linn.	June to September.
APHALARA <i>calthæ</i> , Linn.	<div> <i>Caltha palustris</i>, Linn. <i>Rumex acetosella</i>, Linn. <i>Polygonum hydropiper</i>, Linn. </div>	May to October.
..... <i>nebulosa</i> , Zett.	<i>Epilobium angustifolium</i> , Linn.	
..... <i>nervosa</i> , Först.	<i>Achillea millefolium</i> , Linn.	} May to September.
..... <i>picta</i> , Zett.	<i>Chrysanthemum leucanthemum</i> , Linn.	
..... <i>artemisiæ</i> , Först.	<div> <i>Artemisia campestris</i>, Linn. „ <i>absinthium</i>, Linn. </div>	} June to September.
..... <i>exilis</i> , Web. and Mohr.	<i>Rumex acetosella</i> , Linn.	June to October.
RHINOCOLA <i>aceris</i> , Curt.	<div> <i>Acer campestre</i>, Linn. „ <i>pseudoplatanus</i>, Linn. </div>	} May to end of July.
..... <i>ericæ</i> , Curt.	<i>Calluna vulgaris</i> , Salisb.	June, July.
..... <i>speciosa</i> , Flor*	<i>Populus nigra</i> , Linn.	June, July.
LIVILLA <i>ulicis</i> , Curt.	<i>Ulex europæus</i> , Linn.	June.
ARYTENA <i>genistæ</i> , Latr.	<div> <i>Ulex europæus</i>, Linn. <i>Sarothamnus scoparius</i>, Koch. </div>	} May to September.
PSYLLA <i>spartii</i> , Guér.	<i>Sarothamnus scoparius</i> , Koch.	May, June.
..... <i>Horvathi</i> , Scott*	<i>Genista tinctoria</i> , Linn.	
..... <i>rhamnícola</i> , Scott	<i>Rhamnus catharticus</i> , Linn.	July to October.
..... <i>pruni</i> , Scop.	<i>Prunus spinosus</i> , Linn.	May.
..... <i>cratægi</i> , Först.	<i>Cratægus oxyacantha</i> , Linn.	April to June.
..... <i>costalis</i> , Flor	„ „ „	August.
..... <i>peregrina</i> , Först.	„ „ „	June.
..... <i>costatopunctata</i> , Först.	„ „ „	May to November.
..... <i>pyri</i> , Linn.* ^a	<i>Pyrus communis</i> , Linn. ^c	June to October.
..... <i>apiophila</i> , Först. ^d	„ „ „	June, July.
..... <i>pyrisuga</i> , Först. ?	„ „ „	May, August, Sept.
..... <i>pyrastri</i> , F. Löw.*	„ „ „	June to August.
..... <i>simulans</i> , Flor	„ „ „	August.
..... <i>pyricola</i> , Först.	„ „ „	August.
..... <i>mali</i> , Schindb.	„ <i>malus</i> , Linn.	May to October.
..... <i>visei</i> , Curt.	<i>Viscum album</i> , Linn.	May to September.
..... <i>viburni</i> , F. Löw.*	<i>Viburnum lantana</i> , Linn.	May, June.
..... <i>fraxinicola</i> , Först.	<i>Fraxinus excelsior</i> , Linn.	August, September.
..... <i>fraxini</i> , Linn.	„ „ „	June to September.
..... <i>discrepans</i> , Flor*	„ „ „	May, June.
..... <i>hippophaës</i> , Först.	<i>Hippophaë rhamnoides</i> , Linn.	August, September.
..... <i>phaeoptera</i> , F. Löw.*	„ „ „	June.
..... <i>buxi</i> , Linn.	<i>Buxus sempervirens</i> , Linn.	May to October.
..... <i>stenolabis</i> , F. Löw.	<i>Salix capræa</i> , Linn.	May, June.
..... <i>salicicola</i> , Först.	„ „ „	June to September.
..... <i>betulæ</i> , Linn.	<i>Betula nana</i> , Linn.	June.
..... <i>Löwii</i> , Scott	„ <i>alba</i> , Koch.	February, Nov.
..... <i>Hartigii</i> , Flor	„ <i>verrucosa</i> , Ehrh.	May.
..... <i>alni</i> , Linn.	<i>Alnus glutinosa</i> , Gaert.	July, August.
..... <i>Försteri</i> , Flor	„ „ „	June to end of Oct.
..... <i>pineti</i> , Flor	<i>Pinus sylvestris</i> , Linn.	May to November.
SPANIONEURA <i>Fonscolombei</i> , Först.*	<i>Buxus sempervirens</i> , Linn.	June.
TRIOZA ———, ?*	<i>Berberis vulgaris</i> , Linn.	
————, ?*	<i>Cardamine sylvatica</i> , Link.	

NAME.	FOOD-PLANT.	DATE OF APPEARANCE.
<i>BIOZA cerastii</i> , H. Loew.*	<i>Cerastium triviale</i> , Link.	June.
<i>Walkeri</i> , Först.	<i>Rhamnus catharticus</i> , Linn.	July, August.
<i>rhamni</i> , Schrank.	" " "	May, July to Oct.
<i>ægopodii</i> , F. Löw.*	<i>Ægopodium podagraria</i> , Linn.	April to June.
<i>crithmi</i> , F. Löw.	<i>Crithmum maritimum</i> , Linn.	April to June.
<i>galii</i> , Flor	<i>Galium palustre</i> , Linn.	June to September.
<i>Neilreichii</i> , Frauenf.*	<i>Valerianella dentata</i> , Deitr.	June.
<i>chrysanthemi</i> , F. Löw.*	<i>Chrysanthemum leucanthemum</i> , Linn.	
<i>senecionis</i> , F. Löw.*	<i>Senecio nemorensis</i> , Linn. ^b	July.
<i>flavipennis</i> , Först.*	<i>Lactuca muralis</i> , Don.	} May, Aug. to Oct.
—, ?*	<i>Leontodon hastilis</i> , Linn. ^b	
<i>proxima</i> , Flor*	<i>Hieracium pilosella</i> , Linn.	August and Sept.
<i>flavipennis</i> , Först.*	" " "	May, Aug. to Oct.
<i>Dalei</i> , Scott	<i>Armeria maritima</i> , Willd.	October, November.
<i>chenopodii</i> , Reut.*	{ <i>Chenopodium</i>	
	{ <i>Atriplex</i>	
<i>urticæ</i> , Linn.	<i>Urtica urens</i> , Linn.	May to October.
<i>munda</i> , Först.	" <i>dioica</i> , Linn.	July to September.
<i>salicivora</i> (Reut.), Scott	<i>Salix capræa</i>	August.
<i>striola</i> , Flor*	" "	June to November.
<i>unifasciata</i> , F. Löw.	" <i>purpurea</i> , Linn.	
<i>albiventris</i> , Först.	" " "	Sept. and October.
" "	" <i>alba</i> , Linn.	May, Aug. to Oct.
" "	" <i>fragilis</i>	Sept. and October.
<i>remota</i> , Först.*	<i>Quercus robur</i> , Linn.	
<i>acutipennis</i> , Zett.	<i>Pinus sylvestris</i> , Linn.	May to October.
<i>viridula</i> , Zett.	" <i>abies</i>	June to October.
<i>abdominalis</i> , Flor	" "	August, September.

Lee, S.E.: 26th March, 1882.

DESCRIPTIONS OF NEW SPECIES OF *ÆGERIIDÆ* AND *SPHINGIDÆ*.

BY HERBERT DRUCE, F.L.S., F.Z.S.

Family *ÆGERIIDÆ*.

SARA PRYER.

Wings bright bronze-brown shot with purple; posterior-wing with two transparent spots close to the base, the fringe black; body brown, and the anal tufts bright red. Antennæ and legs black. Expanse of wings, $1\frac{1}{2}$ in.

Hab.: N. E. Borneo, Sandakan (*Pryer*). Mus. Druce.

This species is allied to *S. chalybea*, Butler, from Singapore.

* Not yet ascertained to be British.

^a There is no proof that the *Ps. pyri* of Curtis is identical with that of Linn., and, therefore, I include it amongst those not yet ascertained to be British.

^b The plants are not British, but, probably, the insects may be found on some of the allied species.

^c Pear-trees in gardens should be carefully examined, as several of the species infesting the wild pear, if not the whole, are found upon them.

^d Although Förster says he had one specimen from Mr. Walker, I have not seen any of recent date, and have not, therefore, included it in my former list. The *Ps. notata*, Flor, is synonymous.

Family SPHINGIDÆ.

Sub-Family CHÆROCAMPINÆ.

PANACRA RUTHERFORDI.

Primaries above dark brown, speckled with reddish-brown along the costal margin, crossed from the apex to near the base by a wide, pale-coloured, straight band, bordered on each side by fine blackish lines, the apical margin slightly dentated: secondaries dark brown, paler at the base; body pale brown. Under-side, uniform dull brown, thickly speckled with pale ochreous scales. Expanse of wings, 3 in.

Hab.: West Africa, Cameroons (*Rutherford*).

Type, Mus. Druce.

This species resembles *P. vigil*, Guér., but is easily distinguished by the straight band of the primaries and much darker colour.

CHÆROCAMPA GODMANI.

Primaries dark greyish-brown at the base, which colour extends beyond the middle, the apical third ochreous, clouded with dark brown; several indistinct lines crossing the wings from the inner margin to the black discal dot. Secondaries shining dark slaty-brown, the outer margin dark brown, and a small ochreous spot close to the anal angle; head, thorax, and abdomen above, dark brown, the sides black, bordered above with red, and beneath with white lines, under-side pale brown. Under-side of primaries dark brown, richly clouded with red and yellow scales near the apex; secondaries greyish-brown, crossed in the middle by three indistinct dark lines speckled with reddish scales. Expanse of wings, $3\frac{3}{8}$ in.

Hab.: Panama, Volcano de Chiriqui (*Champion*).

I have only seen one specimen of this species: it is very distinct from any that I am acquainted with, but comes nearest *Ch. falco*. I hope shortly to figure it in the "Biologia Centrali-Americana."

DAPHNIS ANDAMANA.

Much like *D. Horsfieldii*, but rich red-brown; primaries crossed beyond the middle by a broad, dark brown band, palest on the outer margin, a dark brown spot close to the base in the middle of the wing. Secondaries chocolate-brown, crossed by a sub-marginal pale brown line from the middle of the costal margin to the anal angle. Under-side pale reddish-brown, both wings crossed by four darker waved lines; head, thorax, and abdomen dark brown. Expanse of wings, $2\frac{3}{4}$ in.

Hab.: Andaman Islands.

Mus. Druce.

This species seems somewhat intermediate between *D. Horsfieldii* and *D. Baga*, but more closely allied to the latter.

DAPHNIS TORENIA.

Primaries fawn-colour, crossed beyond the middle by a broad brown band, and mottled with brown to near the apex; a large, oval-shaped, brown spot close to the base; the inner half white, with a small black dot in the middle. Secondaries rich chocolate-red, excepting the basal third, which is almost black; an indistinct whitish line, close to the anal angle, extending nearly to the middle of the wing.

Under-side red, closely resembling *Charocampa Belti*, only that the green markings in that species are replaced by greyish-white. Head, sides of the thorax, and base of abdomen dark brown, a white line on each side of the thorax, and crossing the base of the abdomen; the under-side pale reddish-brown.

Expanse of wings, $3\frac{3}{4}$ in.

Hab.: Fiji Islands (*Watkins*).

Type, Mus. Druce.

This fine species is very distinct from any yet described; in form it resembles *D. hypothous*, in colour it comes nearest *D. andamana*.

Sub-Family *AMBULICINÆ*.

AMBULYX ELWESI.

Much like *A. rubricosa*, but shorter-winged and more robust. Primaries rich brown, the outer half the darkest, a series of ochreous marks along the hind margin, extending nearly to the anal angle. Posterior-wing bright pink, the outer half deep brown, an indistinct black line bordered with greyish-blue near the anal angle. Under-side rich brownish-pink; primaries bright pink near the base, and an indistinct greyish band crossing the wing near the outer margin; secondaries crossed in the middle by a pinkish-white band; between it and the base on the costal margin is a brown spot. Head, thorax, and abdomen brown, paler beneath. Antennæ and legs brown.

Expanse of wings, $3\frac{1}{4}$ in.

Hab.: Darjiling (*Elwes*).

Type, Mus. Druce.

This beautiful species is allied to *A. rubricosa* and *A. junonia*. I am indebted to Mr. Elwes for the pleasure of describing and adding it to my collection.

AMBULYX ARGENTATA.

Primaries glossy greyish-brown, almost white at the apex, crossed by a series of pale waved lines, a black dot at the end of the cell, the outer margin and the fringe brown. Secondaries pale brown, thickly speckled with white hairs, a row of white spots crossing the middle of the wing from the anal angle to the costal margin, the spots nearest the inner margin are the largest. Under-side dark pinkish-brown, the spots and markings as above, only more distinct, and speckled with brown scales. Head, sides of thorax, and base of the abdomen dark olive-green. Middle of thorax and abdomen silver-grey.

Expanse of wings, $3\frac{1}{4}$ in.

Hab.: Saigon, Cochin China (*Boucard*). Type, Mus. Druce.

This very distinct species reminds one at first sight of *A. hyposticta*, the under-sides being somewhat alike.

Sub-Family *SMERINTHINÆ*.

TRIPTOGON ROSEA.

Primaries above pale pinkish-brown, crossed by three indistinct brown lines, a dark brown spot close to the anal angle, and a large dark patch of the same colour extending along the outer margin almost to the apex. Secondaries bright rosy-red, with a brown spot at the anal angle. Under-side reddish-brown, both wings crossed by several indistinct, pale brown, waved lines. Head, thorax, and abdomen, pale brown.

Expanse of wings, $2\frac{1}{2}$ in.

Hab. : West Africa, Cameroons (*Rutherford*). Mus. Druce.
Not unlike *T. complacens* from Japan, but quite distinct.

TRIPTOGON CYTIS.

Primaries and secondaries uniformly pinkish-grey-brown, crossed in the middle by a brown line, a small black spot at the base of the primaries : under-side as above.

Expanse of wings, $2\frac{1}{2}$ in.

Hab. : South Africa, Vaal River. Mus. Druce.

A very distinct species, not nearly allied to any with which I am acquainted.

Sub-Family SPHINGINÆ.

PROTOPARCE LAUCHEANA.

Primaries light chestnut-brown, marked and banded with white, resembling *P. solani*. Secondaries blackish-brown. Under-side uniform slate-colour. Upper-side of head, thorax, and abdomen chestnut-brown ; under-side white, tinged with pink.

Expanse of wings, $3\frac{1}{4}$ inch.

Hab. : West Africa (*Thomson*). Type, Mus. Druce.

HYLOICUS REEVEI.

Primaries greyish-brown, crossed from the inner margin to near the apex by a wide whitish band, the outer margin almost black, between it and the white band are several indistinct brown lines. Secondaries greyish-white, bordered with dark brown. Under-side uniform greyish-white, the secondaries almost white. Head, thorax, and abdomen above, black ; under-side whitish. Expanse of wings, $2\frac{1}{4}$ in.

Hab. : Paraguay (*Reeve*). Type, Mus. Druce.

This species is allied to *H. Dynæus*, Hübner, from which it differs in the broad white band on the primaries, and the almost white secondaries. Hübner's species is not included in Mr. Butler's monograph of the *Sphingidæ*, but is well figured in the "Sammlung exotischer Schmetterlinge," Nos. 463, 464.

The Beeches, Circus Road, N.W. :

29th April, 1882.

REMARKS ON SOME CENTRAL AMERICAN SPECIES OF *PYRRHOPYGE*, HÜBN.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

While on the Pacific station during 1872—4, I had an opportunity of making the acquaintance of this remarkable genus, and when *Pyrrhopyge Amra*, Hew., was noticed for the first time at San Blas, on the coast of Mexico, in December, 1873, it was taken for some species of day-flying moth, for its habits were quite unlike those of any

butterfly I had previously met with. They flew very rapidly during the hottest part of the day, and were fond of passing backwards and forwards in front of some favourite bush, before which they occasionally stopped and hovered, their wings being moved with extreme rapidity. Sometimes they would suddenly alight on the under-side of a leaf and were lost to view, and one's beating stick had to be brought into requisition to dislodge them. At other times before settling they would fly in a short jerking manner, somewhat after the fashion of the long-tailed skippers (*Eudamus*). At the Island of Tobago, in the bay of Panama, the following April, another species, *Pyrrhopyge Acastus*, Cram., was tolerably numerous, and I was so fortunate as to discover its larva and pupa and bred the perfect insect. At the time I had no idea what these larvæ would produce, and certainly did not expect to see a butterfly. What they fed on I cannot say, for they were full-grown when found, and preparing to pupate between chinks of bark on a trunk of a tree. They may have fed upon the leaves of the tree itself, or, what is more likely, upon some of the surrounding low herbage. The larva, which is soft and flabby to the touch, is clothed with fine straw-coloured hairs, is somewhat cylindrical in shape, and tapers towards each extremity; head cordate, and very large in proportion to the size of the larva, and of a brick-red; general colour reddish-brown, with well defined segmental rings of a deeper hue, and narrow black, yellow, and reddish perpendicular lines on each segment; under-surface, claspers, and prolegs light red. When full fed it spins a loose network cocoon between chinks of bark and therein turns to a light-red pupa with many segmental black spots, and covered with fine white down, and a purplish powdery bloom. The eyes are black and very prominent. The butterflies emerge in about three or four weeks. Another fine species, *Pyrrhopyge Patrobas*, Hew., was rare, and difficult to obtain in perfect condition, for they flew about so rapidly among the brushwood that they soon became worn.

H. M. S. "Espigle," Simons Bay, Cape of Good Hope :

14th February, 1882.

Euplectus bicolor, &c., on Cannock Chase.—A few days since I found some half-dozen specimens of *Euplectus bicolor*, in decaying birch logs on Cannock Chase. In company with them occurred *Euplectus nanus* (Reich.), *E. nigricans*, *Scydmanus exilis*, *Ptinella testacea*, *P. aptera*, *P. angustula*, *Pteryx suturalis*, *Tetratoma fungorum*, and *Liodes humeralis*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham : May 18th, 1882.

Actidium coarctatum, &c., near Gloucester.—Last autumn, at Barnwood, near Gloucester, in a hotbed composed partly of tan and partly of manure, I found *Nephanes Titan* plentifully, and with it *Ptilium foreolatum*, *Millidium trisulcatum*, Aubé, and one specimen of *Actidium coarctatum*. The capture of this latter insect in a hotbed is worth recording, as confirming the statement of the late Mr. Haliday that he had taken it in such a locality; it has been supposed that he made a mistake, as the *Actidia*, as a rule, are river-bank insects.—W. W. FOWLER, Lincoln: 2nd May, 1882.

Notes on Spring Hymenoptera at Hastings in 1882.—During a stay of a few days at Hastings, from the 6th to the 10th of this month, I succeeded in meeting with a considerable number of species of *Andrena*, &c., and as the season has been one of such unusual mildness I thought it would be of interest to notice those which occurred. Nearly all the species were found either on Sallows in the vicinity of Ore lane, or flying about the sandy banks of the Croft.

Andrena pilipes, ♂ and ♀, common on the Croft, the ♀ with the pubescence of the thorax unusually grey; *A. albicans*, ♂ ♀, Ore; *A. atriceps*, Croft; *A. Trimmerana*, ♂ ♀, Ore, common, a few very brightly coloured females of the var. *spinigera*, most of the females slightly red at the base of the abdomen beneath; all the males of the ordinary *Trimmerana* type—*A. thoracica*, Ore; *A. nitida*, Croft; *A. fulva* ♀, Croft; *A. Clarkella* ♀, Ore; *A. nigro-ænea* ♂ ♀, Ore and Croft; *A. Gwynana*, Croft and Hollington; *A. lapponica* ♀, Ore; *A. præcox* ♀, Ore; *A. varians* ♀, Croft; *A. fasciata*, ♂ ♀, Croft; *A. parvula* ♂, Ore; *Nomada succincta*, Croft; *Anthophora acervorum*, Croft; *Bombus lapidarius*, *B. terrestris*, *B. pratorum*, Ore; *B. Derhamellus*, Hollington.—EDWARD SAUNDERS, Holmesdale, Wandle Road, Upper Tooting: April 11th, 1882.

Gerris lacustris in hibernation far from water.—On the 17th of March, at Weybridge, I had some moss-hunting without success, having found nothing beyond species of insects that are usually seen in or under moss at all seasons, many of the examples defective by efflux of their time. I assume the reason of this paucity was that all the species that had made use of the moss simply for hibernation had gone out and were distributed, induced thereto by the recently previous, and then still existing, hot sunny weather. The abundance of insects of many kinds which had been roused from their various hiding places and were flying at this early season was remarkable; one of them, *Hylurgus piniperda*, I caught with my hat. There was, however, one exception to the general liveliness—a *Gerris lacustris*—which was deep in long damp moss growing under the shelter of a furze-bush on the northern side of a hillock, and this insect though still was not torpid. The remarkable thing, however, was not so much its remaining in seclusion as that it had travelled half a mile away from water to gain its winter quarters; the species usually hibernating close to the water on the surface of which it had lived.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 25th March, 1882.

Capture of the nymph of Aphalara nervosa, Förster, on Achillea millefolium.—For three seasons I have searched diligently for the above and younger forms of this species, but without success, until about a week ago, when, after a couple of hours' work, I was rewarded with the sight of one, and then another, until I took about

sixty specimens. As far as I have observed, they sit in the axils of the leaves, or at the base outside, and with the head downwards. They adhere very firmly to the plant, and when they do move, it is not at a rapid rate. The larvæ are of a more delicate green colour than in the following stage, and are unicolorous. The nymph is of a darker green in some cases than in others. *Head* slightly convex in front, with a faint notch in the middle, and about six to eight short white hairs round the margin. *Antennæ* short, yellow, spigot- or peg-shaped, 1st and 2nd joints green, apex black. *Eyes*, viewed from above, large, greenish-white, from the side-centre black. *Thighs* green, *tibiæ* and *tarsi* pale yellow, apex blackish. *Elytra*-lobes yellowish or very pale brownish-yellow, base pale, costal margin somewhat convex, flattened in the middle, posterior margin slightly concave next the anterior angle, which is acute. *Abdomen* green, convex, with a longitudinal depression or faint channel on each side nearer to the centre than the margin; segmental incisions somewhat strongly defined; margins rounded to the apex, which is acute, and with about ten long white hairs on each side of the last two segments, extreme apex yellowish. Length, 1 line (Paris). The eyes, as seen from above, present a somewhat curious appearance, the creature looking as if it were blind or had a hood over them.—JOHN SCOTT, Lee, S.E.: May 12th, 1882.

Note on Setodes argentipunctella, McLach.—This exceedingly delicate and pretty little species was first described in this Magazine, vol. xiv, p. 105 (1877), from examples taken by Mr. Hodgkinson at Windermere, and by the Rev. A. E. Eaton at Killarney. Mr. King found it in great abundance at the former locality in August, 1881 (*cf.* Vol. xviii, p. 163). When Mr. A. R. Wallace was writing his "Island Life" (published in 1880), he applied to me for a list of *Trichoptera* apparently exclusively British, which appeared at p. 337 of his work, and naturally included *S. argentipunctella*. As a proof of how hazardous it is to generalize upon apparent facts of this nature, I will mention that when on a visit to Belgium in July, 1881, I found the species in the greatest profusion along the banks of the curious little river termed "La Semois," at the town of Bouillon (which it may be well to mention is near the French frontier, and the battle-field of Sedan). It is included in the list of captures made on that excursion (*cf.* Comptes Rendus, Soc. Ent. Belg. xxv, p. cxxxi), which is a sufficient record so far as general distribution is concerned. The subject is brought forward here, in its present form, as a warning against hasty generalization. It is also an argument in favour of what have been termed "mere collectors." If the insect had been (say) Lepidopterous there can be no doubt it would not so long have remained unnoticed in this country, and probably long before its discovery here, some continental Entomologist would have anticipated us in its detection, reversing the conditions that caused it to be placed in a list of species apparently peculiar to Britain.—R. McLACHLAN, Lewisham: 4th April, 1882.

Variety of Zygæna filipendulæ.—Two very interesting specimens of *Zygæna filipendulæ* were exhibited at a meeting of our Local Field Club a week ago by the Vice-President. In one of them the posterior (or sixth) red spot on the anterior wings was entirely absent, and in the other only faintly traceable, so that both might easily have been passed over as "5-spotted." They have, however, the *very narrow* blue-black border to the hind-wings, and the form and general characters of

filipendulæ, and were reared with a number of ordinary examples of that species, from cocoons found in one of the hollows of the coast-cliffs, where no other species of *Zygæna* is found.—CHAS. G. BARRETT, Pembroke: 16th February, 1882.

On the habits of Lepisma saccharina.—Hitherto the “sugar-louse” has been considered rather a harmless creature; but, according to my observations, it has a better character than it deserves, and does much injury, of which, however, it seldom gets the credit, owing to the rapidity with which it disappears when in any way disturbed. It likes moisture, and is partial with me to some cupboards in the wall, and also occurs near the window under the carpet. In such damp places it perforates the carpet by degrees completely. The dust-covers in the seldom-used spare bed room were likewise gnawed in several places, and apparently by this creature, as I constantly surprised it close to the recently gnawed holes. In a badly closed insect box, which was lined with paper, the *Lepisma* had crept in and partially gnawed the paper. It could not manage to reach the insects, being unable to crawl up the long pins; but in one box of *Lepidoptera*, of which the wings here and there touch the wadding which lay above the cork, pieces had been eaten out of the wings by our active little friend. Hence the *Lepisma* may, under certain conditions, become a dangerous enemy to the Entomologist. It belongs to those foes of mankind which, working in concealment, slowly but surely carry on the work of destruction.—GUSTAV DE ROSSI. (Extracted from *Entomologische Nachrichten*, 1882, pp. 22, 23: January, 1882).

Obituary.

Beebe Bowman Labrey, born June 30th, 1817, spent his early childhood at Allonby in Cumberland. When 9 years old he was removed to Manchester, whence he went to the Friends’ School at York.

He early showed a fondness for Natural History, and devoted his attention mostly to Entomology. During the latter years of his life much of his time was occupied in working out and drawing the plumules found on some families of butterflies. The manuscripts and figures he has left behind him were, we believe, nearly ready for publication. About two years ago his manuscripts were stolen from the railway carriage as Mr. Labrey was coming up to London. He immediately set to work to re-write and figure the whole work, from the original plumules he had mounted for the microscope.

He was a thorough and conscientious worker, and had a great facility for learning languages and drawing. He was modest and retiring in his nature, though ever ready and eager to encourage and assist the young.

He died on the 26th April, at his country cottage at Disley, Cheshire, from the effects of suppressed gout.

Entomological collecting on a voyage in the Pacific. [The letter, from which we make the following extracts, written in continuation of one of which the greater portion was published in this Magazine (vol. xviii, pp. 81—86), has been kindly placed at our service, at the desire of the writer (to whom we feel much indebted), by the Rev. W. W. Fowler, to whom it was addressed.]

I added very little to my collection of insects during July and September, at Callao. The butterflies had nearly all disappeared by the end of June, and the weather was generally unfavourable for collecting, as well as the reverse of tropical—the thermometer rarely standing above 65° in the day-time, and usually down to 57°, or even less, at night, so that I often felt quite cold. The sun was sometimes obscured for a week at a stretch, and though there was no actual rain, a dense wet sea-fog (“*Garua*,” as it is called), which may fairly be compared to the traditional Scotch mist, prevailed almost every day, and was far more disagreeable than a heavy shower would have been. I managed to increase my local list of butterflies to 46 species, the additions being small and inconspicuous, with the exception of a pretty yellow and black *Pieris*?. Among the moths, the best novelty to me was a very handsome little *Cerura*, about the size of *C. bifida*, but rather like *C. vinula* in style of marking. The cocoons were not rare on willow-trunks in August, but I have not yet been able to meet with the larva. A few fresh beetles, mostly small *Heteromera*, occurred. On the island of San Lorenzo (6 miles from Callao) the *Coleoptera* appeared to be rather better represented than on the mainland. Early in September, I obtained some 25 species of beetles, mostly *Geodephaga* (*Harpalus*, *Pterostichus*, *Scarites*, &c.) and *Heteromera*—not to mention plenty of scorpions—under stones on the top of the highest hill, 1200 feet above the sea; and among dead mussels on the beach, a large number of a fine species of *Dermestes*, and of a *Phaleria*, very like our British *P. cadaverina*. I also met with a few small moths which I had not seen on the mainland, among them being a very fine *Agdistis*, much larger and more richly marked than our *Bennettii*: I bred it from a little glassy-green larva, which I picked up casually on the sand. San Lorenzo is for the most part excessively barren, consisting of either naked rock or drifting yellow sand; only on the highest summit is there a trifling amount of vegetation, among which the wild potato holds a conspicuous place: it produces well-formed tubers, sometimes two inches in diameter, but they are too watery and bitter to be eatable.

The great event of my stay at Callao, was a trip up the Trans-Andine Railway to Chila, which I enjoyed, on the 17th June. This railway, intended to connect the fertile tropical districts east of the Cordillera with the Pacific coast, is a most wonderful piece of engineering, it being carried up the valley of the Rimac to Chila (12,200 feet above the sea), and then over the main ridge of the mountains to Oroya; the highest elevation reached by the railway being 15,722 feet—about 50 feet less than the height of Mont Blanc! The line has, however, been completed only as far as Chila, and the works have been suspended ever since the beginning of the Chilo-Peruvian war. The scenery all the way is of the most magnificent description, and requires only a little more vegetation to render it perfect, though some favoured spots on the route are verdant enough. At Chila, the hill-sides were carpeted with beautiful wild-flowers, a shrubby lemon-yellow *Calceolaria*, and a plant like a lupine, with showy blue-purple blossoms, being abundant, with yellow hawk-weeds and *Cruciferae*, and a conspicuous species of *Loasa* (I think) with large garnet-red poppy-like flowers, and most formidable stinging hairs. I was able to devote only about half-an-hour to collecting here, and observed five species of butterflies, three of which (*Pyrameis* *Carye*, a small *Colias*?, and a *Satyrus*) appeared only singly, and I could not catch them. The other two were a little satiny-blue *Lycanid* (rare),

and a small *Euterpe*?, not unlike, in miniature, a lovely *Pieris Daplidice* in marking on the upper-side. It was not uncommon, but very active, having much of the flight and habits of a skipper: and owing to the rugged nature of the ground, and the difficulty of active exertion at that elevation, I had much difficulty in securing half-a-dozen examples. On the way up, I managed to snatch a few minutes' collecting at San Bartolomé (4950 feet) and Matucana (7790 feet): at the first place I took a nice *Salpurgus*, and at the latter, a beautiful species of *Pieris*, and a *Colias*, which I have reason to believe is the rare *C. Hermina*, Butler. Chicle would, I think, amply repay any entomologist who could stay there for a few days; I hope to re-visit this locality before I finally leave the Pacific station.

I had become very tired of Callao and its surroundings, and was glad enough when the order finally came for the "Kingfisher" to proceed northwards. We sailed along a miserably barren and surf-beaten coast, calling at one or two small ports, where landing was impossible in the ship's boats, being only practicable in large launches, or in "balsas." These are rude rafts made of logs of a peculiarly light and porous wood (which, by the way, makes capital setting boards): they look very clumsy and unwieldy, but are managed by the natives with great dexterity, and are in general use all along the coast. On September, we arrived at Payta, and stayed there until the 24th. This place has the advantage of a good and safe harbour, teeming with fish: an "Eagle Ray," weighing at least 300 lbs., was caught in the seine, and, despite its somewhat repulsive appearance, was eaten by the ever-hungry sailors. The town is a most wretched little place, and the country for miles round is a waste of naked rock and yellow sand, a few stunted Mimosas and other shrubs, bearing about as many leaves as an average birch-broom, just redeeming it from utter sterility. A few miles inland, the country appears to improve a little, but I had no opportunity of going far from the town. I got a few of the common Callao beetles here, and the only moth I took was, to my surprise, a fine and well-marked specimen of *Agrotis saucia*. Another *Agrotis*, which I cannot distinguish from *A. obelisca*, was caught on board the ship off Huanchacho, a short distance to the southward of Payta.

On the 25th, we entered the Guayaquil River, and anchored for the night at Puno, 40 miles below the port of Guayaquil, whither we proceeded the next morning. The river-banks, all the way up (except near Puno, where there are some low hills), are of a very flat and swampy character, covered with a most dense and luxuriant forest, the trees in many places being really gigantic. The aspect of the forest is, however, somewhat monotonous, the trees presenting but little variety, and scarcely a flower of any sort to be seen; but after the wretched Peruvian coast, the sight of such a glorious extent of green foliage was indeed refreshing to the eye.

Guayaquil is a busy and thriving-looking town, much superior in appearance to Callao: the environs are for the most part swampy and level, intersected with narrow ditches and creeks, the banks of which swarm with land-crabs. At the back of the town are a few hills of moderate height, covered with thorny brushwood. During the four days we stayed here, I added about 30 species of butterflies to my collection: none of them were very large or showy, perhaps the handsomest being the striking, though common, black and crimson *Anartia Amalthea*. A species of *Ageronia* was fairly plentiful on tree-trunks, but was very difficult to secure; and I may also mention some pretty species of *Thecla* (one almost entirely bluish-white

above and beneath); a very minute "blue," not unlike our *P. Alsus* in aspect, but scarcely half the size; a *Phyciodes*, like a miniature *M. Athalia*; two or three handsome skippers, &c. I do not think I saw a single beetle: the most abundant insects were decidedly mosquitoes, of the hungriest description.

We had a pleasant passage of a week's duration from Guayaquil to Panamá, arriving at the latter place on October 7th. Here we remained for about seven weeks, and I think I may safely affirm that I made the most of my time, as I succeeded in obtaining at least 150 species of butterflies, scarcely one of which I had seen before, besides a good many moths and other insects. Beetles were, however, as at Callao, singularly scarce: I got one or two fine Elaters and *Brenthidæ*, some Lamellicorns (*Phanæus*, &c.), *Cassididæ*, and *Chrysomelidæ*, but not a single Longicorn or *Buprestis*! though I fear I must confess that the *Lepidoptera* engrossed most of my attention. I am afraid, too, that I was not there at the best time of year, it being the fag-end of the rainy season; the mornings, it is true, were usually fine enough, but heavy clouds usually began to form about 11 a.m., terminating in a deluge of rain two or three hours later: very few days were fine throughout. The heat, although not really very great (seldom reaching 85°), was extremely oppressive, from the dampness of the atmosphere.

The town of Panamá is built on a low rocky spit, from which an extensive reef, partly dry at low water, runs out for nearly a mile, and considerably lengthens the passage on shore, as it cannot be safely crossed in a boat: the anchorage for large ships is about three miles from the town, as the crow flies, under the lee of the little verdant islands of Perico and Ileña. It is far more picturesque, with its ancient stone walls and red-tiled houses, than the collection of whitewashed mud huts and wooden shanties which pass for towns on the Chilian and Peruvian coasts; there is an extensive suburb of palm-thatched bamboo huts, among which pigs, dogs, fowls, and little niggers revel in happy community of freedom and dirt. The surrounding country, for four or five miles at least, is not much cultivated, and presents a beautifully undulated and varied surface, for the most part covered with dense bush, with fine clumps of large timber here and there. My chief collecting ground was a steep and well-wooded hill, about 550 feet high, immediately behind the town, called the "Cerro de Ancon." Here I spent many a pleasant afternoon, wandering about the shady lanes and pathways which intersect the wood, and revelling in tropical vegetation and tropical insects. I often returned to the ship with a wet jacket, but never without something new to me, in my well-filled collecting-box and helmet. As I am all alone here, and far from books and collections, I cannot venture to name one-fifth of the insects I met with, but I have managed to puzzle out a few of the butterflies, &c., by the aid of Chenu's "*Papillons Diurnes et Nocturnes*," which I have by me.

The tropical American genera, *Mechanitis*, *Ithomia*, and their allies do not appear particularly well represented at Panamá, as I met with very few species—though I believe they are more abundant earlier in the year. *Satyridæ*, on the contrary, are very numerous, many pretty little species of *Euptychia* (some nearly white), occurring in woody places, and a handsome and curiously-shaped brown *Hetera* being not rare in the darkest shady corners. The grandest butterflies are the big *Morpho Peleides* and *Caligo Teucer*, both of which are not uncommon, and the first is a most magnificent object, as it flaps along a wood-path, with the rays of

a tropical sun gleaming on the lustrous blue upper-side of the wings. *C. Teucer* haunts the deep shades of the thickets, and has a provoking habit of dodging into dense underwood when pursued. The under-side of a fine specimen (not often seen, by the way) is really beautiful, with its delicate pencillings of ochreous and grey, and its great yellow-ringed ocelli, like the eyes of an owl. A large, moth-like, orange and brown insect, which I think is *Dynastor Darius*, comes out not rarely about sunset, but flies too high to be caught: the only one I have was bred from a huge whitish and brown chrysalis, which I often met with on tree-trunks and walls, but all empty, except this one. I saw hundreds at Colon, on the Atlantic side of the isthmus, but all vacated by the perfect insect. A large black and white *Brassolis*?, five inches in expanse, is rare. *Heliconius* only occurred to me as the common but handsome black and crimson *H. Melpomene*, and a large, yellow-streaked black species: both are common. *Colanis Phærusa*, a very handsome fulvous and brown insect occurs in grass fields, with a pretty *Junonia* and *Agraulis vanillæ*: another *Colanis*, almost entirely fulvous above, is common in lanes, &c.

Several species of *Phyciodes*, pretty little insects related to *Melitæa*, &c., are abundant among grass, as is also *Anartia Fatima*, a handsome black-brown butterfly with a cream-coloured transverse bar and some small crimson spots. One of the most beautiful and remarkable insects is a species of *Ageronia*, a butterfly about $2\frac{1}{2}$ inches in expanse, of a grey ground-colour, exquisitely marbled with shades of whitish and reddish, in a most intricate pattern. It settles on the trunks of trees with the wings fully expanded, like a *Boarmia*, and always head downwards: when approached, off it goes with great speed, making at the same time a loud and most singular snapping or crackling noise, which I can best compare to the sound of a slight electric spark, at intervals of one to five seconds. This sound is particularly distinct when the ♂ is chasing the ♀, and I have heard it at a distance of at least ten yards: I think it is produced by both sexes. *Victorina Steneles* a large and handsome butterfly, brown, with large blotches of pale leaf-green, was not uncommon, but rarely found in good condition: a new brood was coming out just as I was leaving. Another very showy insect, *Billis Thadana*, rich dark brown in colour, with a vivid crimson sub-marginal band on the hind-wings, occurred to me only singly. I found some twelve or fourteen *Erycinidæ*, some of them handsome little insects, but none of the more brilliant species fell to my share. They are funny little fellows dashing about actively in the wood-paths and openings, and always settling on the under-side of leaves with the wings fully extended. *Thecla* and *Polyommata* were represented at the time of my visit by a few not very conspicuous species: *Terias*, on the other hand, were most abundant, at least 8 species occurring of all shades between pure white and deep orange: *Callidryades*, though not rare, were difficult to obtain, they were so active. Indeed, I may mention that nearly all the larger butterflies, at least, had to be caught on the wing: I did not meet with a single attractive flower, and the insects all seemed to disdain mud, excrement, fallen fruit, sap, and other traditional tropical attractions. I saw only four species of *Papilio*, of which the fine but common *P. Thoas* was very frequent, dashing along the lanes at great speed and very hard to obtain in good order: *P. Polydamas* was not rare in the more open places, and a lovely species (either *P. Erythalion* or *Vertumnus*), velvety-black, the ♂ having a large green blotch on the fore-wings, and a carmine blotch on the hinder pair, these blotches in the ♀ being respectively white

and salmon colour, is common in the denser parts of the woods. The ♀ is closely mimicked by the day-flying *Bombyx*, related to *Hypercompa*, &c., which although smaller, is wonderfully like it on the wing, and frequents the same places. As for the Skippers, their name is legion, they seem absolutely endless, and I used to get two or three fresh species almost every day I went collecting. I have at least 50 species of all sizes, from half an inch to nearly two inches in expanse: a large proportion of them are plain brown, with a more or less distinct curved transverse band of white, yellow, or hyaline spots on the fore-wings: but some of them are very handsome insects, especially those of the genus *Pyrrhopyga* (blue-black with crimson collar and tail, and white fringes). Some of the genus *Thymele* are furnished with very long tails to the hind-wings, of different lengths in the two sexes: others are brilliantly glossed with blue, notably a common species of *Nisoniades*, about the size of our *N. Tages*: while others again are as dull and sombre in appearance as the aforesaid "Dingy Skipper." The moths appeared to be fairly numerous in species, but there were few large or showy ones: a great *Erebus*, six or seven inches in expanse of wings, was not rare on trunks, and was once or twice caught on board the ship, but was not easy to obtain in good condition.

The ship went over to the island of Taboga, nine miles from Panamá, for six days (October 28th to November 2nd), to coal and give leave to the crew. This is a most beautiful and picturesque little island, and as good as, or even better than Panamá as a locality for insects. During the six days I took 80 species of butterflies, 18 of which I never saw on the mainland. Among these I may mention a pretty black and white insect, not unlike our "White Admiral" in appearance and habits: a grand green and black Nymphalid, of the genus *Prepona*, a *Chalybe*? like a very large stout *Thecla*, mostly light bright blue above, the under-side being of the richest metallic green, barred with black and mahogany-red; the hind-wings each bearing two long tails: this is one of the most beautiful insects I have ever seen. There were also some nice *Erycinidæ* and skippers, and three very beautiful fresh Papilios, one being especially handsome, its colour being velvety-black with white spotted fringes, a large spot of most brilliant emerald-green on the fore-wings, and a small crimson spot near the inner margin of the hind-wings, the inner marginal fold of hind-wings being filled with very long dense ashy-white hair. Among the beetles, I was much pleased to get a fine specimen of the huge *Buprestis Goliath*, which was brought to me by one of the sailors.

We left on November 25th, for Callao: and despite heat, mud, tropical showers, mosquitoes, ticks, and other small annoyances, there are few places from which I carry away so many pleasant recollections, as I do from Panamá. Callao was reached on the 6th December, the weather was again fine and pleasant, but I found very little to do in the way of collecting, still, a few interesting additions occurred, notably a fine black and yellow *Papilio* related to *P. Thoas*: this was rare in the perfect state, but I was lucky enough to find the larva in plenty on a small patch of parsnips, and have reared a fine series. I also got a very fine hawk-moth, something like a very large *Sphinx convolvuli*, but seven inches in expanse of wings, on board the ship: also the beautiful moth *Noropsis fastuosa*, which is figured in one of the early numbers of the Ent. Mo. Mag., from a specimen taken in England. Among the *Coleoptera*, I found a very fine long-legged pale brown Lamellicorn, with large horns on the head and thorax of the male, which sex attains the length of two

inches: this is, I think, a species of *Golofa*. It was not rare, sitting on grass-stems and foliage, and flying at sunset like a cockchafer. A fine large species of *Trox* is also perhaps noteworthy: and while speaking of the Callao insects, I must not forget to mention the too-well-known Chigoe or "Jigger" (*Sarcopsylla penetrans*), a most minute flea which abounds in the dust, and (the ♀, at least) burrows under one's toe-nails whenever it can get a chance. I had three or four extracted from my feet, the insect becoming distended with eggs to the size of a small pea, and producing a curious tickling or itching sensation, which (whatever some authors may affirm to the contrary) is the reverse of pleasant. Another of the many disagreeables of Callao is a phenomenon locally known as the "Painter," which is peculiar to this and one or two other Peruvian ports. The water in the harbour suddenly assumes a curious opaque milky-white colour, and emits a most horrible odour of sulphuretted hydrogen with a dash of rotten fish. This delightful phenomenon occurs, on an average, every four or five days in December and January, and seldom lasts less than twenty-four hours: the white paint on the boats, &c., being utterly spoiled by the action of the sulphuretted hydrogen, and turned quite black. I have an idea it is caused by some disturbance of the bottom, such as a slight earthquake-shock, as the mud emits exactly the same smell, and is full of diatoms and other organic bodies, but it is curious that it should be confined to so short a period of the year.

At the end of December, we had a cruise to the southward as far as Mollendo, a small port 400 miles from Callao. I had but one opportunity of landing here, on December 26th: the country is miserably barren, and covered with drifts of white volcanic ashes, said to have come from the great Misti volcano behind Arequipa, some 70 miles distant. Water is brought in pipes from the mountains, and a few vegetables, &c., raised by irrigation. I found two or three ordinary Callao *Lepidoptera* in great numbers, as well as numerous larvæ of the fine hawk-moth *Sphinx 5-maculata*, feeding on all sorts of wild and cultivated *Solanaceæ*.—JAMES J. WALKER, H. M. S. "Kingfisher," Callao, Peru: 6th February, 1882.

Voluntary submergence by the female of Phryganea.—Referring to Mr. J. J. King's observations recorded in last month's Ent. Mo. Mag., on the curious behaviour of a ♀ *Phryganea obsoleta*, it may interest you to know that a somewhat similar proceeding on the part of a ♀ *Phryganea striata* has come under my notice. At a pond near this place I saw the insect in question several times get partially under the water; and once near the margin, where the depth was only 3 or 4 inches, it walked down a grass stem to the bottom where it remained for a minute or so. While submerged it appeared to me to be making an effort to get quit of the large egg-mass which it carried, by dragging its abdomen over the grass-stem. It appeared quite at home on the surface of the water, as it crossed the pond, which is nearly 20 yards broad, several times, attended by some half-dozen sticklebacks.—K. J. MORTON, High Street, Carlisle, N.B.: 17th June, 1882.

[Messrs. King and Morton's interesting observations entirely confirm those made by Mr. Hyndman, at Belfast, in 1833 (first quoted in Curtis's "British Entomology"). I have more than once seen the ♀ on the surface of the water as noticed by Mr. Morton, but never succeeded in observing it descend beneath the surface.—R. McLACHLAN.]

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(Continued from Vol. xviii, page 270).

17. LASIOPS, Meig.

Gen. ch.—Eyes of male hairy, contiguous or sub-contiguous; arista sub-pubescent or bare; abdomen ovoid or narrow, and depressed; alulets small, lower scale nearly or entirely covered by upper one; wings with the third and fourth longitudinal veins parallel, or a little convergent, and with the anal vein prolonged to the margin; legs with the hind tibiæ ciliated on both sides. Eyes of female only slightly pubescent.

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|------------------------|--|-----------------|
| 1. CTENOCNEMA, Kowarz. | | 2. ROEDERI, Kz. |
| 3. MEADEI, Kz. | | |

I have remarked under the genus *Trichophthicus* that the generic name *Lasiops* had been reserved by Rondani and Kowarz for a small group of Anthomyids which have hairy eyes, naked aristæ, very small alulets, and prolonged anal wing veins. Zetterstedt described two species in his great genus *Aricia* which belonged to this group (*A. glacialis* and *A. eriophthalma*), and Rondani one in his genus *Lasiops* (*L. anthomyinus*). None of these have been yet found in Britain, but Herr Kowarz, in his elaborate monograph, has determined five others in addition to the above, three of which belong to the British Fauna. These little flies closely resemble each other, and only differ by slight structural points, so that they may easily be confounded, and are very difficult to discriminate. They all have the back of the abdomen marked by a broad black longitudinal stripe, as well as by transverse black bands on the edges of the segments, so that the surface is divided into eight squarish grey patches, much in the same way as the abdomen of *Anthomyia radicum*, Linn., is marked; hence the name of *L. anthomyinus* given to the Italian species by Rondani.

L. CTENOCNEMA, Kz.

The eyes in the male of this species are contiguous in the middle, and covered thickly with longish hairs; the thorax and scutellum are shining and brownish-black, the former is indistinctly striped, and whitish-grey on the sides and front edge; the abdomen is oblongo-conical, pointed at the apex, which is black and shining, with the sub-apical appendages (*hypopygium*) small, and the ventral lamellæ projecting and somewhat hairy; the alulets have the scales slightly unequal, and are fringed with long yellowish hairs; the wings have a brown tinge, with the third and fourth longitudinal veins decidedly convergent, and the external transverse veins

oblique; the legs have the hind tibiæ evenly ciliated with bristles of moderate length along the whole of their externo-posterior surfaces, and also with finer bristles or hairs on their internal and anterior sides; the pulvilli are small. Common in Yorkshire.

L. ROEDERI, Kz.

This species principally differs from the last by having the dorsum of the thorax and scutellum grey instead of black, and by the former being distinctly striped with three and sometimes five lines; the wings have the third and fourth longitudinal veins parallel until near their extremities, when they become slightly convergent; the armature of the hind legs is similar to that of *L. ctenocnema*. I have captured a few specimens of this little fly near Bradford.

L. MEADEI, Kz.

This species closely resembles the other two in size and form, the length of them all being about 4 mm. (2 lin.); it differs from both *L. ctenocnema* and *L. Roederi*, however, by having the hind tibiæ ciliated on their externo-posterior surfaces with only a few bristles of irregular lengths along the upper half, instead of with a regular even row down the whole length; the eyes also have shorter hairs; the thorax is blackish, with three distinct stripes; the alulets are fringed with a few black hairs, the third and fourth longitudinal veins are quite parallel, or sometimes slightly divergent; and the pulvilli are larger than in either of the preceding species. Found sparingly near Bradford.

I know of no decided character by which the females of the above three species can be distinguished from each other; those which I possess are rather smaller than the males, are grey in colour, have the eyes very slightly and indistinctly pubescent and widely separated, the frontal space occupying about a third of the width of the head. This space contains a black central stripe, bordered on each side by a whitish-grey margin, which is about one-third the width of the middle stripe. The thorax is light grey, with five pale brown longitudinal lines. The abdomen is grey, with a longitudinal black central stripe, and some transverse marks which are indistinct, and do not reach the edges of the segments. The wings are clear. The legs have the hind tibiæ ciliated only with a few spines on the outer sides.

Before proceeding with the enumeration of the remaining species of *Anthomyiidae*, I must make a short digression. The genus *Anthomyia*, as restricted by Meigen in his supplementary (7th) volume, is so large, even after the species belonging to *Ophyra*, *Homalomyia*, and *Azelia*, which he included, have been abstracted from it, that it is necessary to sub-divide it further. This sub-division has already been attempted by R. Desvoidy, Macquart, and Rondani; the first author carried it, however, too far, and the groups which the others formed are very artificial and unsatisfactory, so I shall venture to propose a new arrangement.

In the first place, the pale-legged and pale-bodied species must be

separated from the black-legged ones, and replaced (with one exception) in the genus *Pegomyia* of Desvoidy and Macquart. By both these Dipterologists the genus was restricted to those species which have the bodies, as well as the legs, always more or less yellow; but I think it will be better to include in it all those with pale legs, whether the abdomen is yellow or not, for there are several species, as *A. hemorrhæa*, Zett., and *P. hyoseyami*, Desv., which have the abdomen sometimes partly yellow and sometimes entirely grey.

With respect to the black-legged species, I shall retain the name of *Anthomyia* for a small group (embracing Desvoidy's genera *Anthomyia* and *Egle*) which is more highly developed than the others, having the alulets rather larger with the scales unequal in size. The remainder of them must be again separated into two divisions; for the first of which I shall adopt Macquart's name *Chortophila*, restricting it (as Macquart did in theory) to those species which have the abdomen more or less thickened and cylindrical. To the second and largest division, which will include all those species which do not belong to either of the other groups, I shall give Desvoidy's name of *Phorbia*.* The flies in this group have the abdomen narrow and elongated, or oblong, and flattened.

The above genera may be thus tabulated:

A. Abdomen and legs black or grey.

B. Alulets with the scales unequal in size.

Gen. 1. ANTHOMYIA, Meig.

BB. Alulets with the scales equal in size.

C. Abdomen in ♂ sub-cylindrical.

Gen. 2. CHORTOPHILA, Macq.

CC. Abdomen in ♂ narrow or oblong, and depressed.

Gen. 3. PHORBIA, R. Desv.

AA. Legs always, and body generally, partly pale (rufous or testaceous).

D. First longitudinal vein armed with spines.

Gen. 4. ACANTHIPTERA, Rond.

DD. First longitudinal vein unarmed.

Genus 5. PEGOMYIA, Desv.

18. ANTHOMYIA, Meig.

Egle, p. R. Desv.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in the males; arista pubescent or bare; forehead and face slightly prominent; epistome often projecting; abdomen ovoid or oblong, and depressed, often

The species placed by Desvoidy in this genus belong to his "*Anthomyæ herbicolæ*." See Essai sur les Myodaires, p. 559.

much thickened at the apex in the males; alulets rather small, but with the scales unequal in size; wings with the third and fourth longitudinal veins parallel or slightly convergent at their extremities, anal vein prolonged to the margin; legs always black or grey.

1. PLUVIALIS, Linn.

procellaris, Rond.*imbrida*, Rond.

2. ALBICINCTA, Fall.

3. PRATINCOLA, Panz.

4. RADICUM, Linn.

vulgaris, R. Desv.*brassicæ*, Wdm.

5. SULCIVENTRIS, Zett.

6. OCTOGUTTATA, Zett.

A. PLUVIALIS, Linn.

This common pretty spotted fly varies a good deal, the spots often coalescing so as to alter the design on the thorax and abdomen. Two of the varieties thus produced have been exalted by Rondani into distinct species, but they possess no real specific distinctions.

A. ALBICINCTA, Fall.

This little species bears a good deal of resemblance to the last, but, besides being very much smaller, differs in having the thorax black, with two white spots on the hinder part in front of the scutellum. The abdomen is marked as in *A. pluvialis*, being white with a dentated black band at the base of each segment. Not common.

A. PRATINCOLA, Pz.

This species has the abdomen marked in a very similar manner to those of the two preceding ones, but the thorax is peculiarly figured, being of a whitish-grey colour, with a single black elongated rhomboidal mark in the centre of the posterior part. It is about the same size as *A. albicincta* (about 3 mm., $1\frac{1}{2}$ lin.), and is also rare.

A. RADICUM, Linn.

This excessively common little fly, which, as its name imparts, feeds in the larva state upon the roots of plants, especially on those of the cabbage tribe, is often confounded with other species. It may be recognised by its projecting epistome; by the unequal sized scales; by the thorax being black, and marked in the male by two short, grey, narrow stripes (rather than by three wide black ones, as is usually stated); by the rather short, wide, somewhat pointed abdomen, with a longitudinal dorsal black mark, crossed by three transverse straight black lines, extending of an even width to the margins; and by the third and fourth longitudinal veins of the wings being slightly convergent at their extremities.

A. SULCIVENTRIS, Zett.

This species bears a good deal of resemblance to *A. radicum*, but is less; has the antennæ much shorter; the arista more pubescent; the thorax without any distinct stripes on the dorsum, only having an irregular white line on each side; and the abdomen less pointed, and thicker at the apex as well as differently marked; it

being of a dull grey colour, with three transverse sulci on the dorsum, and a rather indistinct longitudinal black stripe, which appears in certain lights to be dilated into triangular spots, opposite the sulci or depressions. Common in pastures.

A. OCTOGUTTATA, Zett.

This little species (which only measures about $2\frac{1}{2}$ mm.) also has considerable resemblance to *A. radicum*, being marked in a very similar way on the abdomen, by a longitudinal and three transverse stripes, which divide the surface into eight light grey square spots; the thorax, which is black, has also two short white stripes on its anterior parts: it differs, however, from *A. radicum* in having both the face and epistome less prominent, the third and fourth longitudinal wing veins quite parallel at their extremities, the abdomen narrower, sub-cylindrical, more hairy, and furnished with two projecting lamellæ beneath the apex in the male, which is but little thickened; the alulets are also smaller in proportion than in *A. radicum*, but still have the scales slightly uneven in size.

I have only seen one male specimen of this rare little fly, which I captured near Bradford in July, 1875.

(To be continued).

A LIST OF THE BUTTERFLIES CAPTURED IN BARRACKPORE PARK DURING THE MONTHS OF SEPTEMBER, 1880, TO AUGUST, 1881.

BY G. A. J. ROTHNEY.*

Barrackpore is situated on the right bank of the river Hoogly, 16 miles above Calcutta. The park comprises a strip of land on the river-bank some two miles long by about 1200 yards broad. Insect life, in the way of butterflies, commences to be active about March, and increases till May, when there is a slight lull till the rains commence about the 15th or 20th June. Insects are then very plentiful till the end of August, when another lull occurs till about the breaking up of the rains—the end of September, or first week in October—when the collecting season finishes up with a fine burst of life, lasting to about the 20th October; after which insects gradually disappear, few butterflies, &c., being seen after the end of that month. The flowers most frequented by butterflies in the park are: *Duranta Plumieri*, *Quisqualis indica*, *Poinciana pulcherrima*, *Mussaenda macrophylla*, and a tree with a small white hanging blossom (name not known), but the first-named is by far the most attractive.

EUPLEINÆ.

Limnas Chrysippus, Linn., *Salatura Genutia*, Cram., *Tirumala Limniacæ*, Linn., very common. March to October. Heavy, lazy flight.

Parantica Aglea, Cram., rare.

* Communicated (with description of a new species) by Frederic Moore.

Crastia Core, Cram., very common. March to October. Heavy, lazy flight. Frequents the shade of Banian trees, &c. Very fond of settling on damp ground. Frequently taken *in coitu*.

[*Isamia Rothnegi*, Moore (n. sp.), male. Upper-side olive-brown; basal area darkest: fore-wing with a sub-marginal row of small whitish spots, and a marginal row of smaller spots, both rows decreasing in size towards the costa; sericeous streak short and broad: hind-wing with a pale flesh-coloured discoidal patch; a sub-marginal row of oval, and a marginal row of smaller, whitish spots. Expanse, $3\frac{1}{2}$ inches.

In colour and pattern of markings, this interesting new species resembles the very common *C. Core*, for which insect Mr. Rothney mistook it. One specimen only occurs in this collection, and it is the only example known to me. Its nearest ally is a Ceylon species (*I. Sinhala*).—F. Moore.]

SATYRINÆ.

Lethe Europa, Fabr., one specimen only captured.

Melanitis Ismene, Cram., common, but difficult to catch. Found in shade, either under bamboo or under mangoe tops. When disturbed is fond of settling in cactus hedges.

Calysisme Samba, Moore, *Blasius*, Fabr., *Drusia*, Cram., *Perseus*, Fabr., *indistans*, Moore, common. Fond of shade. Settle mostly in long grass.

Elymnias undularis, Drury, male common; female rare. Settles in dense foliage, close to the trunk.

NYMPHALINÆ.

Charaxes Fabius, Fabr.

Symphadra Nais (*Thyelia*, Fabr.). Two specimens only captured.

Discophora Zal, Westw., rare. Fond of shade.

Precis Laomedea, Linn., not common.

Junonia Orithya, Linn., rare; *Ænone*, Linn., rare; *Lemonias*, Linn., *Asterie*, Linn., *Almana*, Linn., common, from early March to end of October. Fond of the sun and flowers.

Ergolis Ariadne, Linn., *Merione*, Cram. Habits as above.

Limenitis Procris, Cram., rare.

Neptis Varmona, Moore, *Kamarupa*, Moore, common, but difficult to capture. Fond of the sun.

Apatura Bolina, Linn., *Jacintha*, Drury, *Misippus*, Linn., not uncommon. Habits much the same as in the European Purple-Emperor, except that they are contented with a lower perch.

Atella Phalanta, Drury, common, from early May to September.

Cirrochroa Anjira, Moore. One ♀ specimen only captured (Identical with the Andaman type).

ACRÆINÆ.

Telchinia violæ, Fabr. A hot season insect; delights in the sun. Not common.

ERYCINIDÆ.

Abisara suffusa, Moore. May to October. Not common.

LYCÆNIDÆ.

Anops Thetys, Drury. Single specimens may be taken from May to September.

Pithecopa Zalmora, Butler.

Chilades Varunana, Moore, *Laius*, Cram.

Tarucus Theophrastus, Fabr., rare; *Plinius*, Fabr., rare.

Castalius Rosimon, Fabr., rare.

Jamides Plato, Fabr., rare. June. Fond of the sun, and settling on damp ground.

Catochrysops Strabo, Fabr., rare; *cnejus*, Fabr., rare; *Pandava*, Horsf., common; early March to end of October, and may be found during the cold months of November to February.

Zizera diluta, Felder, *Sangra*, Moore. Habits as above.

Lampides Ælianus, Fabr. Found in the shade. Has a quick, restless flight. May to August.

Polyommatus baticus, Linn., rare.

Lycænesthes bengalensis, Moore, rare. July.

Virachola Isocrates, Fabr., rare. July and August.

Rapala schistacea, Moore, rare. August.

Aphnaeus Etolus, Cram., common. May to September. Fond of the sun.

Tajuria longinus, Fabr., rare. July.

Hypocænæa Talindra, Horsf., rare. July.

Loxura Atymnus, Cram. Found in the shade of bamboo tops. Has a slow, weak flight.

Mahathala Ameria, Hewits., rare, one specimen only. July.

PIERINÆ.

Nychitona Xiphia, Fabr. (*Nina*, Fabr.), common in shady lanes, May to September. Never seen in the sun. Has a slow, weak flight; fond of ditches.

Terias Hecabe, Linn., very common. Found everywhere. March to October; especially during rains. A lover of sunshine. *Purreea* and *simulata*, Moore, both rare. *Drona*, Horsf., rare; during the rains.

Catopsilia Catilla, Cram., not uncommon during the rains. July and August. *Crocale*, Cram., very common, especially during the rains; a lover of sunshine and flowers. The variety (*Endeer*) occurring at the same time. *Pyranthe*, Linn., very common during the rains. There is a faded (?) or dull dirty-coloured form that appears with this insect, so constant in its uniform appearance, that it almost suggests a variety or species (?). This is generally found during the rains, and also early in the year. It is not very common. *Gnoma*, Fabr., *Ilea*, Fabr., not common.

Ixias latifasciata, Butler, *Marianne*, Cram., rare. Appear during the rains. Most difficult to capture: have a powerful and very dodging flight.

Huphina Evagete, Cram., *Zeuxippe*, Cram., *Hira*, Moore, common in the rains. Fond of flowers, especially *Duranta Plumieri*.

Caophaga Paulina, Cram.: two specimens only taken during the rains; *Darada*, Feld., one specimen only.

Belenois Mesentina, Cram., one specimen only.

Nepheronia Gala, Feld., common: May to October; *Hippia*, Fabr.

Delias Eucharis, Drury: the commonest Barrackpore butterfly. In numbers from April to October.

PAPILIONINÆ.

Pathysa Nomius, Esper., rather uncommon. Frequents the flowers of *Duranta Plumieri*.

Zetides Doson, Felder. Habits, as above.

Orpheides Erithonius, Cram., extremely common, from end of March to end of October. A dark, yellow variety is also found at the same time and places, but is comparatively rare. This latter has a much stronger mode of flight, and is much more difficult to capture. The difference of action is almost sufficient to suggest a difference of species.

Laertias Pammon, Linn., common. March to October. The dimorphic females (*Polytes* and *Romulus*) much less frequently met with.

Menelaides aristolochiæ, Fabr. (*Diphilus*, Esp.), very common: March to October; *Hector*, Linn., common: March to October.

Chilasa dissimilis, Linn.; *Casyapa*, Moore, common during the rains.

HESPERIDÆ.

Badamia exclamationis, Fabr., very rare.

Parnara Bada, Moore.

Suasta Gremius, Fabr. (*Divodasa*, Moore), very rare.

Matapa Aria, Moore, very rare.

Chapra Agna, Moore, extremely common, from March to October.

Telicota bambusæ, Moore, and *Angias*, Linn. Habits, as above. A favourite food of the Indian hornet (*Vespa cincta*).

Halpe Beturia, Hewits., rare. September.

Astictopterus Salsala, Moore. September.

Udaspes Folus, Cram., rare. Odd specimens from May to August; in long grass.

Hesperia Galba, Fabr., common, May to September.

April, 1882.

NATURAL HISTORY OF *HELIODES ARBUTI*.

BY WILLIAM BUCKLER.

It is with extreme gratification that I now find myself giving the history, from the egg, of this little sun-loving species, which I owe to the most kind and persevering help I had the pleasure to receive from Mr. H. T. Stainton in 1880, and again in 1881.

In the former year on the 23rd of May, I received a cluster of about eight eggs, resulting from a moribund female after being a short time in a killing bottle of poison, but long enough, as it proved, to have destroyed their vitality.

On 26th of the same month, I was elated on receiving alive five captured examples of the moths; as two of them were females I imprisoned them and the most lively male together, in a pot containing

sprays of *Cerastium glomeratum* and *vulgatum* covered with leno, whereon they were occasionally fed with a drop of sugar and water which the male imbibed plentifully, the females less often, and one of these soon left the leno and alighted on the *Cerastium* and sat there with extended antennæ and wings gently vibrating as though intending to lay: the next day was dull and cloudy, and the two on the leno only flew around whenever a chance ray of sun gleamed on them, but late in the afternoon they made me hopeful of success when I saw they had paired about half way down on the side of the pot, where they remained five hours and a half together; they were fed for five more days and fresh *Cerastium* added, but in vain, as they died without either female depositing even a single egg.

As a forlorn hope I squeezed from the abdomen of the gravid and dead female several eggs, and after a few days I fancied one of them at least was changing colour, and in the afternoon of June 7th this one really began to hatch, and while noting down its details, which were well exposed to view, I could see the little larva making continual efforts to free its hindmost segment from a part of the shell adhering to the other eggs, but it was unable to extricate itself, and by next morning had perished.

With the return of May in 1881, I felt greatly encouraged to persevere, on finding that my previous failure had by no means diminished, but perhaps increased, the kindly interest taken by Mr. Stainton in elucidation of the early stages of this insect, and he lost no time in giving me the result of his observations, both in literature and in the field; so that I soon learned what flowers were most visited by it—for, as may well be supposed, some doubt of the food plant had naturally by this time occurred to me—and that *Cerastium arvense* was the plant assigned to *H. arbuti* by Carl von Tischer, who communicated this to Treitschke and afterwards to Freyer, as quoted by both, whom Guenée appears to have followed; I also learned that *C. arvense* does not grow in the district where *arbuti* is found flying by Mr. Stainton, but that *C. vulgatum* does, plentifully, of which he kindly sent me a few plants for potting on the 21st, and on the next day as many as twenty specimens of *arbuti*, all in lively condition.

The moths were distributed in three pots of growing plants, protected with glass cylinders and leno covers; two of the pots contained the *C. vulgatum*, and the third pot some different plants of the *Caryophyllææ*, besides in each some tufts of *Bellis perennis*, whose blossoms constantly attracted and helped to nourish them, as did also

sugar and water frequently supplied ; in the evening of the 23rd, I saw one egg had been laid on the glass cylinder, and on the 25th, another egg on the opposite side of the same glass enclosing some of the *Cerastium*.

On the 1st of June, a friend brought me some plants of *C. arvense* in full bloom, kindly obtained near Lewes, as the plant does not occur in this locality, and these were potted and protected with glass just in time for a second consignment of five living *arbuti* from Mr. Stainton, who yet in a day or two supplemented them with four more ; an egg was very soon laid on a leaf of *arvense*, and on the 7th, I saw another egg was laid on the base of the calyx near the stalk of an expanded flower of one of the same plants ; these two eggs I cut off and sent to Mr. Hellins for his examination, who had an accident which settled the first egg, and the second he pronounced to be addled.

Meantime I had often looked in one pot of *C. vulgatum* wherein no egg could ever be detected while the moths were alive nor after the cylinder was taken away—yet, on the 8th of June, I was greatly delighted to see a larva quietly sitting on a stem, in an attitude rather suggestive of the letter S—after recovering equanimity from such an agreeable surprise, I became aware of a hole in the side of the seed capsule a little above it, and soon detected a second larva sitting quietly in the same manner, and then a third larva partly protruding from one of two contiguous capsules, and next, the hole in another capsule from whence the second larva had eaten its way out, like the first evidently soon to moult, a process they both accomplished in evening of the 10th, and henceforward lived outside more or less exposed, feeding well on both flowers and unripe seeds ; on the 13th, I saw they were again waiting for another moult which occurred a little before midnight of the 14th with one, and with the other at some early hour in the morn ensuing ; they soon resumed feeding and had grown decidedly by evening, and continued to eat quite voraciously, but less of flowers and more of seeds, eating out a number of capsules within a few hours, in this reminding me of the *Dianthæiæ* ; they were full-fed by 18th of June, when they left their food and lay up motionless for a day and night, as though to purge themselves of their grossness while secreting the needful silk before entering the earth for pupation.

These larvæ conveyed an instructive lesson in showing why I failed the year before to get any eggs laid on sprays of the food plant when *gathered*, also on this occasion the wonderful instinct and prevision, I may say reasoning power, of the parent moth or moths who refused

to lay more than three eggs on the few plants confined with her or with them—for there remains the possibility that perhaps three females were confined and each laid one egg, knowing there would be barely enough sustenance for a single larva—but, however this may have been, it would seem that in nature the female would deposit her eggs singly, probably in the corolla or on the calyx of a flower, just here and there one, in proportion to the abundance of the plant.

I know not if this larva had been seen by any human eye since the time of Carl von Tischer, but the time for it to be found in this country had come, for on the 17th of June, I received a further very kind attention from Mr. Stainton in the arrival of a full-grown larva of *arbuti*, which he had gathered by chance while getting some *C. vulgatum* for a Coleopteron in the field where *arbuti* flew; this larva in no way varied from those I had reared, and proved to be only twenty-four hours later in maturing: curiously enough this incident was repeated similarly by the Rev. J. Hellins, to whom I had sent a larva of *arbuti* reared from an egg laid, I presume, *within* a flower of *C. arvense* (as after many repeated close searches I failed to find more than the two before mentioned on *arvense*), and he, returning home with some of that species for food on July 2nd, found a larva of *arbuti* emerging from one of the seed capsules he had gathered.

The egg of *arbuti* is globular, about $\frac{3}{8}$ mm. in diameter, having a slight depression beneath, it seems thin-shelled and finely pitted all over, shining, and is of full yellow colour, turning rather brownish just before hatching on the seventh day.

The newly-hatched larva is white, with brown head and a narrow brown plate on the second segment. After living hidden within a seed-capsule and feeding on the unripe contents for about from fifteen to seventeen days, during which it has got through its earliest moultings and acquired a colouring that assimilates most wonderfully well with that of the capsule of the plant, as it waits outside for its penultimate moult; it has a brown head streaked and spotted with darker brown, and the body is either of a pale watery-green colour or slightly tinged with pinkish-grey, and marked with a dark green dorsal line, a whitish sub-dorsal line, and a stouter white spiracular line, the ventral legs clear and nearly colourless: after this moult it is nearly 6 mm. long, the head and second segment pale brown with slightly darker brown marks, the rest of the body much deeper and richer coloured than before, either a greenish-grey or a pinkish-grey ground—as both varieties occur at this stage, and now the dark slaty-green dorsal line runs in the middle of a broad softened stripe of paler

ground-colour than the rest of the back and the side ; next comes the whitish sub-dorsal line, and after an interval of ground-colour the perfectly white spiracular stripe, both of these are very conspicuous ; though all the ventral legs are equally well developed, it still often assumes its former favourite position while resting, which is very much like that of a half looper, holding on sometimes by the anal and fourth pair of ventral legs only, at other times with addition of the third pair, while the others and all the fore part of the body are held off free, with the head bending downwards forming an arch ; after feeding three days the ground colour is lighter and greener and the length when laid up is 11 mm.

After the last moult it attains in four days its full growth, when the length is 20 mm. and stoutish in proportion, of true *Noctua* form with plump twelfth segment, the thoracic segments slightly taper towards the smaller and rather flattened head, the mouth prominent ; in colour the head and plate are of a light greenish tint and glossy, the ground of the rest of the body is light green, the dorsal line dark green, the whitish sub-dorsal line is finely edged above with darker green than that of the back and side, the yellowish or yellowish-white spiracular stripe is well relieved along the upper margin by a conspicuous dark green stripe, the spiracles are whitish, finely outlined with black, the tubercular dots are brown but too minute for any but powerfully assisted vision, the belly and legs a rather paler green than the back, the skin soft and smooth ; when it has ceased to feed and is laid up all the lines soon disappear, and it is then of an uniform green colour.

The larva fabricates at about an inch or two beneath the surface of the soil a cocoon of earth, with a thickness of wall about 1 mm., or in parts even less, kneaded well together with silk, and slightly attached to a few coarse particles of earth outside, it is of close texture and not very brittle, the general figure is roundish or roundish-oval, and measures about 9 by 6 or 7 mm., the interior is very smooth and just fits the pupa comfortably without room to spare ; the pupa itself is of a very dumpy form, with rather a bluntly tapered abdomen, having at the tip two fine thorny points of inconceivable minuteness, and in contact with the compressed old larval skin ; in colour the pupa skin is reddish-brown and rather shining, and in length 6 to 7 mm.

The perfect insects were bred, both male and female, in the morning of the 4th, and a female on the 11th, of this month.

DESCRIPTION OF A NEW SPECIES OF *HEMIPTERA-HETEROPTERA*
FROM CENTRAL AMERICA.

BY JOHN SCOTT.

The number of individuals of *Hemiptera-Heteroptera* which I have had in my possession for a very lengthened period, either given to me by friends, or otherwise obtained, has induced me, now that I have cleared other matters off, to commence upon their investigation. They embrace examples from Chontales, Bogota, Rio Janeiro, St. Paulo, and other places in the South American Continent; and, beyond the list which it is my intention to give, will, no doubt, furnish several hitherto undescribed species. I shall in every instance add the source from which they came, so that my friends may see that their many little acts of kindness have not been forgotten.

MICTIS (?), Leach.

MICTIS (?) JANSONI.

Ochreous-drab. *Antennæ* black, with very short black hairs, insertion of the 1st joint pale above, 4th with very short, yellow pubescence. *Pronotum* between the fine transverse wrinkles, thickly and finely punctured; sides widely diverging posteriorly, narrowly black, shining, dentate; disc with three fuscous-black longitudinal lines, the side ones shortest, terminating at a deep transverse depression beyond the acute hinder angles; hinder sides waved, narrowly black, toothed; posterior margin straight, with a slight tooth at the extremities of the scutellum. *Scutellum*, disc, anteriorly coarsely, basal third finely, wrinkled, the latter regularly waved from the centre. *Elytra*, except the nerves, very finely and irregularly punctured: *corium* with a narrow, fuscous, longitudinal streak at the base, within the marginal nerve, and two short streaks on the disc: *membrane* pitchy- or slightly olive-brown, shining. *Sternum* ochreous-drab, rugulose-punctate. *Legs* ochreous-yellow: *thighs*, at the apex, dark; *tibiæ* piceous; *tarsi* pitchy-black. *Abdomen*, above and below, brownish-yellow; *connexivum* black, with an almost square reddish-yellow spot on each segment; last segment reddish-yellow, apex black.

Head ochreous-drab, antenuiferous tubercles on the upper-side chestnut-brown. *Antennæ* black, clothed with very short, stiffish, semi-erect, black hairs: 1st joint insertion, on the upper-side, narrowly pale brownish-yellow, 4th clothed with a very short, yellow pubescence, causing it to appear of a golden-yellow colour in certain lights. *Rostrum* above, piceous.

Thorax: *pronotum* ochreous-drab, somewhat shining, finely wrinkled transversely, except a smooth space behind the collar, which is somewhat trilobate, posteriorly, between the wrinkles thickly and finely punctured, and next the hinder angles a few granules; sides widely diverging as they approach the hinder angles, where they are slightly concave, narrowly black, shining, armed with teeth rounded on their tips; disc with three fuscous-black longitudinal lines, the central one extending throughout its entire length from the inner margin of the collar, the side ones about half its length, terminating at a deep transverse depression, extending

almost from side to side beyond the hinder angles, gradually becoming shallower as it approaches them; hinder angles slightly raised, produced into a long acute tooth; hinder sides waved, narrowly black, toothed; posterior margin across the scutellum straight, with a slight tooth at the extremities of the latter. *Scutellum* pale brownish-yellow, sides narrowly margined; disc, apical two-thirds coarsely wrinkled transversely, basal one third finely wrinkled and regularly waved from the centre to the sides, down the middle a somewhat obscure fuscous streak, terminating before reaching the apex. *Elytra* ochreous-drab, except the nerves, very finely and irregularly punctured; *corium*, side-margins almost parallel, slightly concave from near the base to in a line with the apex of the scutellum, marginal nerve at the base fuscous, within the latter a narrow, fuscous longitudinal streak, terminating about in a line with the apex of the elavus; disc with two short brownish or fuscous streaks, the upper one running parallel with the margin of the inner nerve of the exterior basal cell, the lower one below the apex of the exterior nerve of the same: *membrane* pitehy or slightly olive-brown, shining. *Sternum* ochreous-drab, rugulose-punctate. *Legs* ochreous-yellow; *coxae*, 1st and 2nd pairs, the apex on the inside, narrowly black, 3rd brownish-yellow, apex more or less fuscous. *Thighs*, 1st and 2nd pairs, the apex with a narrow black margin, underneath with two rows of four or five teeth placed at irregular intervals, and not opposite to each other, the 2nd next the apex longest, tip narrowly black, 3rd pair fuscous-brown, shining, with three pairs of teeth next the apex, not placed opposite to each other, near the base a long curved black tooth, its base and apex brown; *tibiae*, 1st and 2nd pairs piceous, apex brown, with two teeth on the under-side towards the latter; 3rd pair piceous, sides brownish-yellow, with a long curved tooth in the middle on the under-side and three smaller ones next the apex; *tarsi* pitehy-black, with short yellowish or reddish-yellow hairs on the under-side.

Abdomen above, brownish-yellow: *connexivum* black, with an almost square, reddish-yellow spot on each segment before the apex, last segment reddish-yellow, apex black; underneath brownish or slightly fuscous-brown.

Length, 1 in. 3 lin. (Paris).

Although I have placed the above-described insect in the genus *Mictis*?, I have merely done so to enable me to investigate more fully certain characters, whereby, if found sufficient, I may characterize it under the name of *Apodesmus*.

It (a ♂) was sent by me some considerable time ago to the late Dr. C. Stål, who returned it as unknown to him. It was taken by the late Mr. E. M. Janson (after whom I have named it), at Chontales, Nicaragua.

Lee: 26th February, 1882.

Capture of Aphalara nebulosa, Zett.—Following up my note on this species (Vol. xviii, page 275) and believing that the plants of "*Epilobium angustifolium*," on Boxhill, must now have grown to some considerable height, I started, on the morning of the 29th ult., fully equipped and determined to work out Dr. O. M. Reuter's announcement that this plant was the head-quarters of the insect in ques-

tion. After I had arrived at the spot I began beating the plant into my umbrella, and not two minutes elapsed before I had secured some half-a-dozen specimens of the *Aphalara*, and so I continued taking them for some time, when I desisted, not wishing to exterminate the species. I was further intent on securing the larvæ or nymph-form, but, observing that some numbers were pairing in my collecting bottle, I concluded that this was now an impossibility, so I lay down and examined the plants for the ova. After searching for some little time I noticed that one or two leaves had a narrow longitudinal fold on the margin, turned outwardly; one of these I pulled and opened very carefully, when I discovered the eggs laid in a single row along the centre of the fold. In form they are elongate-oval, narrowed at each end, and standing perpendicularly about $\frac{1}{3}$ of a Paris line from each other with one end fixed to the leaf. In colour they are starch-white and easily distinguished.

JOHN SCOTT, Lee: 1st June, 1882.

Hylecætus dermestoides, &c., on Cannock Chase.—During a recent visit to Cannock Chase I beat from birch trees the following (amongst many other) species of *Coleoptera*:—*Hylecætus dermestoides*, *Cryptocephalus coryli*, *C. punctiger*, and *C. fulcratus*. From alders on some boggy ground at the northern side of the Chase, I obtained a large number of specimens of *Lina ænea* remarkable for their brilliant golden-coppery colour.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: June 19th, 1882.

Pachetra leucophæa at Box Hill.—On the 22nd ult., I visited Box Hill (in company with Messrs. Church), and took a *P. leucophæa*, ♀, at rest on the trunk of a whitethorn; it deposited ova which duly hatched, and the larvæ are feeding well on *Poa annua*.—BENJ. ARTHUR BOWER, Eltham Road, Lee, S.E.: 18th June, 1882.

Varieties of Zygæna filipendulæ.—The variety or form of *Z. filipendulæ* alluded to by Mr. C. G. Barrett, in the June number of the Ent. Mo. Mag., in which the sixth spot is only faintly traceable, is by no means uncommon. The late Mr. W. P. Weston had a splendid series from Tilgate Forest, many of them bred, and I have frequently taken a similar variety at Folkestone. The Folkestone specimens, however, not only appear early in June before the majority of *filipendulæ* are out of the larval state, but are smaller and have the border of the hind-wings broader than the Tilgate specimens, especially in the ♀, and I have been somewhat inclined to regard them as hybrids between *trifolii* and *filipendulæ*, and should, therefore, have expected to find that *trifolii* occasionally occurs on the summit of the cliffs to which Mr. Barrett alludes, but, either from its early appearance or from the summit not being so much worked, had been overlooked.

It was a curious circumstance that Mr. Weston's specimens were from a part of the Forest where for several years I had taken the large marsh form of *trifolii*, but never seen *filipendulæ* in any of its stages.

The variety in which the sixth spot is entirely absent is far scarcer; and as, so far as my experience goes, it is confined to ♀ specimens, it would be interesting to know whether the specimen referred to by Mr. Barrett is a ♀ or not.

In the specimens I have seen the absent spot is always to be found on the underside, so, beyond the question of hybridism, no doubt as to identity can exist.—C. A. BRIGGS, 55, Lincoln's Inn Fields: 2nd June, 1882.

Lepidoptera at Wicken Fen.—From May 27th to 31st I spent at Wicken, collecting chiefly on the Fen. *Meliana flammea* was common, but most of the specimens I took were much worn; it had evidently been out some time, indeed, a local collector told me he had taken a wasted example so early as May 13th. *Papilio Machaon* was also plentiful, and certainly showed no sign of dying out as yet at Wicken. On Whit-Monday, the 29th, it was flying freely even in a little wood about half-a-mile from the nearest point of the Fen. I found the eggs easily by searching the *Peucedanum palustre* on the Fen. *Arctia urticae* was just getting out; and *Simyra venosa* was not uncommon, but not easy to catch. Other species included *Strenia clathrata*; *Coremia unidentaria*, abundant (*ferrugata* was not observed); *Phibalopteryx lignata*, common and fine; *Taniocampa gracilis*, this is the common *Taniocampa* of the Fen, its young larvæ were feeding in the top shoots of the *Spiræa*; *Chilo phragmitellus*, just appearing, I also took full-grown larvæ in the old reed-stems; *Melia sociella*, on palings at Soham; *Halias chlorana*, on the Fen, &c., &c.—GEO. T. PORRITT, Huddersfield; June 6th, 1882.

Argyrolepia Schreibersiana re-discovered.—On a warm still day, in the middle of May, I happened to be searching poplar trunks for imagos of *Cerura bifida* when I came across a handsome orange *Tortrix*, quite unknown to me. Continuing my search I found that the species was quite abundant, more especially on trunks of elm (*Ulmus suberosa*), in fact, I took some four dozen in much less than an hour. I sent a couple of specimens to Mr. Warren, of Cambridge, who took them to be *Eupacilia gilvicomana*, a mistake that Mr. Standish committed *vice versa* when he took *gilvicomana*. I next sent some specimens to Mr. Harwood, of Colchester, who immediately wrote to me suggesting that they were *Argyrolepia Schreibersiana*, an opinion in which Mr. Barrett, of Pembroke, concurred. Mr. Barrett writes, "*Schreibersiana* feeds on elm—so Ragonot tells me, and I think Zeller also. Herrich-Schäffer says on *Prunus padus*, first in leaves and then in twigs; Heinemann that it pupates under bark of trees." I can fully confirm the observations of Heinemann, as the empty pupa cases stick out of the elm bark in considerable numbers. With regard to the locality I will only say that it is very limited in extent, and to disclose it would be to ensure the speedy extermination of the species. I will, therefore, go no further than to state that it is situate in "The Cambridgeshire Fens," that delightfully vague locality so frequently quoted in Mr. Stainton's Manual. I have visited the habitat of this species several times since I discovered it, but have purposely refrained from taking very many specimens. Mr. Stainton gives Yaxley and Cambridgeshire as localities, and I am not aware that it has been taken elsewhere, with the exception of a single specimen captured by the Rev. A. Wratislaw, near Bury St. Edmunds. I hope to work out the economy of this species during the season.—GILBERT HENRY RAYNOR, Hereward Hall, Ely: June 13th, 1882.

Ceropacha ridens and *Taniocampa miniosa* in *Pembrokeshire*.—Larva-beating on occasions of excursions of our local Field Club to woods in distant parts of the county last year resulted in the addition of two rather unexpected and interesting species to the local fauna, to wit, *Ceropacha ridens* and *Taniocampa miniosa*, specimens of both of which have emerged this spring. Consequently, these woods have received some little attention during the past and present months, and larvæ of both

species have been found rather freely; those of *miniosa* feeding at first in small colonies on the outer branches of the oak trees, but afterwards, when shaken down by the prevalent gales, making themselves quite comfortable on stunted oak bushes underneath. Unfortunately, many were destroyed by parasites, and I fear more by their companions. Those of *C. ridens* were discoverable by looking up at the large bushes overhanging the wood roads in sheltered places, curled half round underneath the leaves. They are feeding so far quite satisfactorily.—C. G. BARRETT, Pembroke: June 14th, 1882.

Stigmonota nitidana in Pembrokeshire.—When beating for larvæ in a wood of singularly stunted oaks near the sea, on the 6th inst., a little dark Tortrix fell into the umbrella. Not having seen it alive for a good many years, I was well pleased to recognise the pretty little *Stigmonota nitidana*. Further beating showed that it was not scarce, but also that it was by no means inclined to fall quietly into an umbrella and be boxed; so the net was resorted to, and, after a short time, I found that it actually swarmed in a sunny spot, well sheltered from the rough wind then blowing. The pretty little creatures could be seen sitting on and running about the oak leaves in the sunshine, and by sweeping the leaves with the net, plenty were secured.

Very few other Tortrices were seen. *Roxana arcuana* was not scarce, flying swiftly about the oak trees and bushes, and *Ptycholoma Lecheana* occurred rarely. A few *Sericoris urticana* were doubtless only the advance guard of approaching swarms.—ID.

Dipterous larvæ in the human subject.—At one of the meetings of the International Medical Congress, Dr. W. G. Smith stated that a girl, aged 12, presented herself with the following history. About three months before being seen by a medical man, an ovoid swelling appeared on the outer side of the right ankle, causing her some pain and uneasiness in walking. This swelling gradually shifted its position and slowly moved up the leg, thence towards the right axilla, then down to the elbow, and finally settled on the back of the neck. In this position a small dark spot appeared, an orifice formed, and when pressure was made around this opening, a white grub, nearly an inch in length, protruded and escaped along with some unhealthy pus. Several other similar swellings developed upon subsequent occasions under medical observation, and the medical man extracted other grubs, exactly similar to the first specimen. No cause could be assigned for these curious phenomena. The larvæ were pronounced by competent authority to belong to a Dipterous insect, although the genus could not be satisfactorily determined. There was no sufficient proof of the existence of an *Æstrus* peculiar to man alone. A good abstract from which the above is quoted appeared in the British Medical Journal, 1st October, 1881. I shall feel grateful to any of your readers who will give additional information or references.—WILLIAM E. A. AXON, Fern Bank, Higher Broughton, Manchester: June, 1882.

Two species of Nomada new to the British List.—I am glad to be able to add *Nomada bifida*, Thomson, and *Nomada guttulata*, Schenck, to our list of *Hymenoptera*. The former very closely resembles *ruficornis* but may be known by the bifid apex of the mandibles, those of *ruficornis* being sharply pointed; *guttulata* may be known by the three short black obtuse spines at the apex of the posterior tibiæ, there

is a good figure of the apex of the tibia in Dr. Schmiedeknechts' "*Apidæ Europææ*," pl. iii, fig. 8. I have several specimens of *bifida*, but unfortunately most of them have no note as to locality. A few males, however, have the locality Canterbury upon them, and I hear from Mr. Bridgman that he has specimens taken near Norwich; of *guttulata* I have only a single female, also without note of locality. It much resembles *ochrostoma* but is smaller and rather shorter, and the spines of the tibiæ are very different. I think, if Hymenopterists would direct their attention to this genus, we should probably further increase our list of species, as in many cases the distinguishing characters, though well defined, require careful searching for. Collectors would, therefore, do well to bring home all the specimens they see, as it is nearly impossible in the field to know for certain what species is under notice.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 14th June, 1882.

A Marine Caddis-fly.—Since the announcement published in Vol. xviii, p. 278, of this Magazine, I have received the materials forwarded by Prof. Hutton. These consist of a cylindrical, straight, tubular, moveable case, formed of coralline sea-weed, and a slide, on which is a larva (badly crushed), and the fragments of a pupa, from which the perfect insect was ready to emerge (*not*, as Prof. Hutton thought, the perfect insect itself). From the maxillary palpi I can identify it as being that of a ♂ of *Philaniscus plebejus*, Walker (= *Anomalostoma alloneura*, Brauer), already known from New Zealand. According to the case, *Philaniscus* should probably form an anomalous genus of *Leptoceridæ*. Full details, with figures, will shortly appear in the Journal of the Linnean Society.

The *Helicopsyche*, so far as can be judged, appears to be congeneric with the forms that have been bred in Europe and in North and South America. There are cases with larvæ and pupæ, and two ♀ pupæ emerged from their cases, but not transformed into perfect insects.—R. McLACHLAN, Lewisham, London: 3rd June, 1882.

Reviews.

THE STUDENT'S LIST OF BRITISH COLEOPTERA; with Synoptic Tables of Families and Genera. Compiled by FRANCIS P. PASCOE. Pp. i—viii and 1—120, small 8vo. London: Taylor and Francis, 1882.

The author modestly styles this little book a "compilation." Every Catalogue or List must of necessity be a compilation. But there are compilations and compilations. A clever compiler, with no knowledge whatever of the subject, may produce a very useful work, and sometimes more so than comes from the pen of one full to the brim with special knowledge, and also with opinions of his own. Possibly the best compilations are those made by writers who may be classed between these two extremes. Such a writer we consider Mr. Pascoe, so far as British *Coleoptera* are concerned. The "Student's List" cannot fail to be useful to all British Coleopterists, and its price places it within the reach of all. The ascending scale is adopted, therefore, it commences with the *Coccinellidæ* and ends with *Cicindela*. The old great divisions are retained. The tables for families and genera appear to be generally accurate, and form a novel feature that ought to prove useful to all who have acquired the rudiments of knowledge. Probably errors both of omission and commission may reward the labours of a critical investigator; we fancy that all such

discoveries would be gladly acknowledged by the author if communicated to him. The Preface is most distinctly *not* a compilation, but a very vigorous exposition of the author's views on the burning question of priority; he declines to be bound by any absolute rule, but deplores the changes constantly made. As this is the very latest of the somewhat numerous lists of British *Coleoptera*, it might have been useful had the author stated the number of species enumerated, for comparison with previous lists.

Our author is very severe on writers of "unrecognisable" descriptions. These are of two classes. Firstly, those by writers utterly incompetent (from want of knowledge) to perpetrate a description; secondly, those by writers fully competent, so far as knowledge is concerned, but who fail to impart that knowledge to others in an educational sense.

A BIBLIOGRAPHY OF FOSSIL INSECTS. By SAMUEL H. SCUDDER, republished from the Bulletin of Harvard University. Pp. 1—47. Cambridge, Mass., 1882.

A very laborious compilation of between 900 and 1000 references, with short explanatory notes to each; indispensable to all who are engaged in the study of this branch of Palæontology. In a short introduction Mr. Scudder explains that it was originally made for private use; he has done wisely in publishing it.

INSECTS INJURIOUS TO FOREST AND SHADE TREES. By A. S. PACKARD, Jun., M.D. Pp. 1—275. Washington: Government Printing Press, 1881.

Forms Bulletin No. 7 of the United States Entomological Commission. Decidedly one of the most valuable of the many publications on Economic Entomology that have issued from the pens of American entomologists, very copiously illustrated by excellent woodcuts. All the insects known to feed upon the principal trees are enumerated, and very many of the references form concise life-histories of particular species. Under "oak" we find 214 references, under "elm" 43, under "pine" 102, under "birch" only 19, under "beech" only 15, and so on. Of these, of course, only a few can be classed as *really* injurious insects. We commend this work alike to biologists and to foresters, and those having the care of public or private parks; these latter, however, should not suppose that the presence of wood-feeding beetles, &c., is the primary cause of trees being in a bad condition; it is probable the insects are often there *because* the trees are unhealthy.

ENTOMOLOGICAL SOCIETY OF LONDON: *May 3rd*, 1882.—H. T. STANTON, Esq., F.R.S., &c., President, in the Chair.

Dr. Evald Bergroth, of Helsingfors, was elected a Foreign Member, and Mr. Williams, Zoological Society, Hanover Square, an ordinary Member.

The President, in alluding to the death of Mr. Darwin, one of the original Members of the Society, and to the great loss entomology and natural science generally had sustained, mentioned that Mr. Darwin's connection with the Society occurred during the voyage of the "Beagle," the Society having been founded after his departure and before his return.

The Secretary read a letter from the "Epping Forest and County of Essex Naturalists' Field Club," asking the Members to sign a Memorial in favour of the Forest being retained in its wild condition, to which request the Members who were on the Council had already given adhesion.

Mr. W. C. Boyd exhibited curious varieties of *Eidonia atomaria* and *Anchocelis pistacina*.

Mr. Billups exhibited a ♂ of *Cryptus titillator*.

Mr. Kirby exhibited bred hybrids between *Antheraea Pernyi* and *Roylei*.

Miss Ormrod exhibited galls on the inflorescence of ash, which Mr. Fitch said were produced by a species of *Phytoptus*. In connection with this, Mr. McLachlan called attention to the "sausage gall" on the mid-rib of the leaves of the same tree, occasioned by *Cecidomyia botularia*, and Mr. Fitch alluded to a gall on the fruit, produced by an unknown larva, probably one of the *Curculionidæ*.

Mr. Bridgman communicated a further paper on British *Ichneumonidæ*, supplementary to Mr. Marshall's Catalogue of that family, published by the Society.

Mr. E. Saunders read a continuation of his Synopsis of British Aculeate *Hymenoptera*.

Prof. Westwood sent an extensive memoir on the habits of the *Eurytomidæ*, a family of *Chalcididæ*, but of which one or two species, known as "joint worms," appeared to be non-parasitic, and to be *directly* the cause of the swellings on the stems of various cereals, &c., thus occasioning much damage. One of the most notorious of these was *Eurytoma hordei*. This paper occasioned much discussion, and Mr. Fitch avowed, as his belief, that all the *Eurytomidæ* were purely parasitic.

7th June, 1882.—The President in the Chair.

Dr. Mason exhibited a variety of *Zygana filipendulæ* from Bewdley Forest, in which the bronze-green ground colour had invaded and obliterated the spots of the anterior-wings and the corresponding colour in the posterior (such a variety was known as *chrysanthemi*, Hübner), and in connection therewith a parallel variety of *Callimorpha dominula*. He also called attention to two species of *Noctuidæ* that had found their way into the British List. The first of these was *Xylophasia Zollikoferi*, the supposed British specimens of which, he said, were only bleached examples of the dark variety of *X. polyodon* (he exhibited an individual of the true *Zollikoferi*); the second was *Agrotis helvetina*, of which he exhibited both the true species, and a specimen upon which it was introduced as British; this latter was very different, and, in his opinion, was a bleached variety of *Noctua augur*.

The President stated that so far as his experience went this year, all the larvæ of *Nematus ribesii* (the gooseberry saw-fly), which had been hatched this season, had died when quite young; currant leaves riddled with small holes were not unfrequent, but he had not yet seen a single leaf that had been stripped by these insects; last autumn he had noticed a similar mortality amongst the young larvæ of this species, but this season it seemed so general (at any rate in his locality) as to threaten the extinction of the species.

Mr. McLachlan read a List of British *Trichoptera*, brought down to date, with especial reference to the Catalogue of British *Neuroptera*, published by the Society in 1870, noticing such additions and corrections as had occurred or become necessary; 152 British species were now known, indicating an addition of twenty per cent. since 1865, when the Monograph of British Caddis-flies appeared.

Mr. Distant read a paper on new species of *Cicadidæ* from Madagascar, in which he alluded to the genus *Platypleura* as occurring nearly all over the world.

Mr. Butler communicated a continuation of the series of papers on the *Lepidoptera* of Chili, collected by Mr. Edmonds, and especially concerning the *Geometridæ*. In connection with some remarks made by the author, as to the difficulty of determining the species noticed by Blanchard, in Gay's "Historia Fisica," Mr. McLachlan expressed his belief that most of the types of species indicated in that work still existed in the Natural History Museum of Paris, and had been overlooked.

THE NATURAL HISTORY OF *RIVULA SERICEALIS*.

BY WILLIAM BUCKLER.

Herein I have to give the history of this species from the egg, and to show how, after the first failure to solve the problem of its food-plant, a second trial ultimately proved successful, and for this I have to acknowledge my indebtedness to Mr. W. R. Jeffrey, for his kindness in enabling me to work it out most thoroughly, of which indeed the full-grown larva and pupa were evidently known to Guénée, but the food plant had not been observed; probably, the larva had been captured after ceasing to feed, and so gave no clue to its food; but we now know for certain the food of its own choice.

The first attempt was made in 1878 from eggs which Mr. Jeffrey induced a captured female moth to lay upon leaves of various low plants, from 12th to 14th of July, and in the share he kindly sent to me I found two eggs on a bramble leaf, four on *Stachys sylvatica*, one on *Solidago virgaurea*, and one on *Fragaria vesca*: they all hatched on the night of the 20th, and the young larvæ were provided at once with leaves of all the above-named plants, besides others, and next day, on seeing none were eaten, other kinds of leaves were given in turn, but the tiny creatures refused every kind of nourishment offered them, and died of starvation, and those with Mr. Jeffrey shared the same fate.

In 1881 Mr. Jeffrey was able to obtain another batch of eggs from *sericealis*, and he again gratified me with part of them on the 24th of July, laid on *Lotus major*, a plant he had observed to be plentiful where the parent moth was captured, though she laid one cluster of eggs without attachment to any plant; in the evening of the 29th, I found a single larva hatched, and twenty-four more next day, when all were put on the *Lotus*, and some other different leaves were tried both by Mr. Jeffrey and myself, with increasing anxiety at finding nothing eaten, and the larvæ, one at a time, were beginning to die off in evening of 31st, when the last thing I happened to put with them was a piece of the leaf of *Phalaris arundinacea*; next morning I was greatly rejoiced to see this bit of coarse grass, when held against the light, showing a number of transparent lines of varying lengths, and the fact was immediately communicated to Mr. Jeffrey, and afforded him a clue to the proper food-plant, as he confidently assured me no *Phalaris* grew where the parent moth was taken, and therefore could only be a substitute food; in this belief, he accordingly took pains to clear up the point by again visiting the locality, while my eleven surviving larvæ were growing, and presently moulting from 8th to 12th August.

Meanwhile, Mr. Jeffrey had captured one or two more female moths, and confined them with three or four species of grass from their locality, and he found *Brachypodium sylvaticum* to be the one most favoured, of which he kindly gave me abundant evidence on the 9th of August with a blade of this grass on which were laid, in the most natural manner, about seventy eggs, singly, and side by side in scattered groups; to this grass the larvæ of the first brood took readily and left the *Phalaris*, their second moult occurring on 16th to 17th, and third moult 25th to 27th, when apparently they fed no more before they were laid up to hibernate; the later brood were, of course, fed throughout on the *Brachypodium* and thrived well, moulting also three times, the second moult happening from 16th to 19th September, the third moult from the 26th to 4th of October, and on the 5th all were hibernating.

On 21st of February, 1882, the air became suddenly warm, and many of the larvæ awoke from their long sleep, and for several days hung suspended by short threads; they seemed very weak and unable to feed, though their grass was beginning to put forth tender shoots, yet they soon relapsed into a torpid state when the weather became colder during the month of March, and many then died.

On the 1st of April, with milder weather, I observed one individual larva had, by its bright colours, apparently moulted, though I had no other evidence to judge from, as it was feeding openly on the potted grass quite unprotected; its next moult took place in captivity at midnight of the 19th, it recommenced feeding in course of next day, and continued till the 29th, when it was laid up for what proved to be its last moult, which occurred late at night on 6th of May, and from that date it fed on till the 15th, when it was again laid up, but this time for the pupal change, which occurred on the night of the 20th: in like manner I watched the changes of three others, the last one becoming a pupa on 8th of June.

The perfect insects were bred on the mornings of June 6th, 16th, 18th, and 27th, those on the second and last date were females; on comparing notes with Mr. Jeffrey for this account, I found his first moth was bred on the same day at about the same hour as mine, and that a large proportion of his larvæ had been reared on *Brachypodium pinnatum*.

The egg of *sericealis* is circular in outline, not quite flat, but just a little rounded at the circumferent margin, very numerouslly ribbed and reticulated, of a light greenish-drab tint, semi-transparent, and

rather glistening ; a few hours before hatching the top of the egg becomes slightly convex, like a bun, and shows through the shell three or four dusky brown specks.

The newly-hatched larva is quite hairy, and, on examination, its head is seen to be whity-brown, with dark mouth and ocelli, and a dark grey internal dorsal vessel can be but indistinctly discerned through the skin of the body, as it is clothed with long white hairs, and amongst them are sub-dorsal hairs of a dusky greyish colour ; when a week old the back becomes tinged with very bright green, and the belly appears limpid and colourless ; up to this time it feeds on the cuticle of the grass.

After the first moult it eats out a little notch from the edge quite through one side of a leaf ; the head now is greenish speckled with dark red, the body is of a watery green, showing the internal vessel deeply tinged with dark purplish-red, so that the back appears of this colour, but with an interruption on the twelfth segment, the wart-like tubercles are glossy, and furnished with long single blackish hairs.

After the second moult, it feeds in the same manner as before, the dark purplish-red back shows an extremely fine double dorsal line and whitish sub-dorsal lines, the pale greenish head has minute dusky specks, and each speck emits a black hair, and each tubercle of the body also is similarly furnished.

After the third moult the larva is of just the same colours, and with all details of the previous stage, it now ceases to feed. and, after spinning a little silk as a foothold, becomes torpid until spring of the following year.

Having hibernated, and got safely over its subsequent fourth moult, its light green colour is very much brighter, the dorsal line is now darker *green*, and the sub-dorsal is creamy-white ; it still attacks the edge of a leaf by first eating out a notch as far as the midrib, and thence eats away either upward or downward, taking out long portions, and always from the upper surface, until, in course of a week, its growth becomes more perceptible, as it attains a length of from 5 to 6 mm.

After the fifth moult its appearance is unchanged beyond the increase of growth, as it soon extends to 7 or 8 mm. in length ; its ravages on the grass are rather conspicuous, as it goes from one leaf to another, yet is careful not to attack the extreme point or the midrib, but after the 6th, or last moult, it feeds differently, beginning at the top, head upward, and eating downward through the midrib from one edge to the other in rather an oblique direction across the full

breadth of the leaf; sometimes two or three leaves are thus eaten, more or less, but when its appetite is nearly satisfied, it eats only about three parts across the truncated top edge, so as to leave a portion uncut on one side, generally about half an inch long; but previous to this the larva has reached its full growth, the length ranging from 15 to 17 mm., according to sex, as the largest proved to be female; the form is cylindrical, and of moderate stoutness, the head rounded, and the three hinder segments slightly tapered, the anal legs extended backward; the greenish-drab coloured head with dusky dots and hairs, as before, the bright green of the body is deepest on the back as far down as the trachea, which shows faintly through the skin as a paler thread, the belly is of a rather lighter tint of the same green, the subdorsal stripes are white, and commence on the second segment, continuing of the same width throughout, though drawing nearer each other as they approach the thirteenth, the outer edge of these is straight, but the inner edge is concave on every segment, so that the green ground of the back appears in a series of broad ovals, with a darker green dorsal line running through them; the segmental folds greenish-yellow; the round spiracles are flesh-colour finely edged with blackish; the warty green glossy tubercles have each on the summit a fine dusky dot bearing a longish rough hair, which when highly magnified proves to be barbed; all the legs green, the ventral and anal fringed with fine blackish hooks; the skin of the body is soft and rather velvety.

As soon as it has done eating at the partly truncated top edge of the leaf, as before mentioned, it remains quiet at that place for some hours, for it is *there* it ultimately pupates after arresting the growth of the leaf, and there, a little below the cut edge, it spins a few silk threads which draw the sides of the leaf a little towards each other and cause an oval-shaped hollow in part lined with silk, wherein the larva lies with either its head near the top edge or else the tail is there, as examples of both postures occur, and one or two threads are passed loosely from side to side over the back of the larva, forming a stay or cinch to secure all in position, and a few more over the hinder segments as further security, the uncut portion of the top edge of leaf is drawn down obliquely over the top of the hollow which shelters the occupant and hides a part of it from view, although it is all on the upper surface of the leaf, but the colour of the larva assimilating with that of the grass is no doubt a source of protection, and the same with that of the pupa.

The pupa is about $10\frac{1}{2}$ mm. long with nothing remarkable in its

form, the wing-covers well developed with their nervures in strong relief, the abdominal segments are smooth and very lightly defined, the anal tip is furnished with several minute curly-topped spiny bristles, which are thrust into the silk and held fast; its colour is green, having beyond the thorax the two white sub-dorsal stripes which marked the larva, these gradually fade away as it matures, and the wing-covers turn very pale, then afterwards quite dingy, and at about 9 o'clock the next morning the perfect insect is disclosed.

Emsworth: *July 12th, 1882.*

A LIFE HISTORY OF *PAPILIO PÆON*, ROGER.

BY J. J. WALKER, R.N.

It had, for some time, been a matter of surprise to me, that among the butterflies observed in the vicinity of Callao, the genus *Papilio* was not represented: and it was, therefore, with no small satisfaction that, on January 13th, I captured a somewhat worn example of a grand black and yellow "swallow-tail," *Papilio Pæon*, closely related to, but apparently quite distinct from, the noble *Papilio Thoas*, L., which I had met with not rarely at Panamá.

During the next few days, I searched assiduously for the insect, and succeeded in finding its head quarters, about three miles from Callao. It was, however, by no means common, and the few specimens caught were invariably in poor condition. At last, one very warm afternoon, I noticed a worn ♀ hovering over a double row of parsnip-plants, in a small patch of cultivated ground, evidently depositing eggs. I at once got up from the bank on which I was lounging, and examined the plants: before long, I came upon a little caterpillar, which presented such a wonderfully close resemblance to a piece of fresh bird's-dung, that I at first hesitated about taking it up. It betrayed itself, however, as a *Papilio* larva, by protruding a forked tentacle from the 2nd segment: so I continued the search, and soon had forty of these little fellows in my larva-box.

The internal arrangements of a man-of-war do not afford any very great facilities for larva-rearing, and I was at first a little puzzled how to dispose of my captures. By covering a good-sized fruit-basket with lino, and hanging it up to a beam in my cabin, I made an extempore breeding-cage, in which the larvæ thrive as well as could have been desired. The larvæ continued to occur freely on the aforesaid parsnip-plants (the only ones I could find), and at the end of February, I had the pleasure of rearing a noble series of the perfect insect.

The egg was often found on the upper-side of the leaflets of parsnip (*Pastinaca sativa*), but always singly. It bears a curious resemblance, in its shape and irregularly roughened surface, to a minute orange: its diameter being about one thirtieth of an inch, and its colour pale cinnamon-brown.

The newly-hatched larva is about two lines long, nearly black, with a pale V mark on the face, and a light brown saddle-shaped spot on the 8th segment: a large black tubercle on either side of the swollen 3rd segment, and one on either side of segments 4 to 13, gradually decreasing in size to the 12th segment, that on the 13th being nearly as large as the one on the 3rd. These tubercles are covered rather thickly with long black hairs.

On the 8th day, the larva was 7 lines long; the tubercles were still distinct, but the skin was slightly shining, and entirely destitute of hairs: colour brown-black, with a short, lateral stripe on segments 2 to 4; a large lozenge-shaped spot on either side of segments 6 to 8 (the hinder angles meeting on the back), and an irregular cloud on the sides of segments 12 and 13, pale whitish-ochreous: prolegs whitish.

At the penultimate moult, the larva was 10 lines in length: the above markings more distinct, the 4th, 5th, and 12th segments more conspicuously swollen than at any other stage. The skin was then very shining, and the resemblance of the creature to a piece of fresh moist bird's-dung, was most extraordinary.

The full-fed larva is by no means easy to describe, but the following is an attempt:—Length, about two inches. Head small, rather dark shining grey-brown: the segments rapidly increase in size to the 4th and 5th, which are quite half as large again as any of the others. This enlargement is very conspicuous when the larva is at rest, the anterior segments being retracted after the fashion of a *Chærocampa* larva. The 6th segment is abruptly smaller, and thence to the hinder extremity, the body is almost uniform in size, the 12th segment only being very slightly enlarged. The front edge of the 4th segment is rather raised, and extended forward, bearing a curved transverse row of five small pale-edged tubercles. Colour (in a fully marked specimen), rich umber-brown, marbled with paler, darkest on segments 2 to 4, and 8 to 12. A broad, irregular, lateral, creamy-ochreous stripe, sometimes slightly tinged with pink, meeting in front of segment 2, well-defined on segments 3, 4, and 5, it then expands into a large, irregular, rhomboidal blotch, the hinder angles of which unite on the back of segment 9; thence the stripe is rather ill-defined,

gradually getting wider and paler as it nears the hinder extremity. An indistinct, pale, ochreous stripe above the prolegs: spiracles and legs pale brown, under-side and prolegs cool grey. Skin smooth, not at all shining. Tentacula long and slender, orange-yellow: these are protuded when the larva is irritated, and emit a powerful and not disagreeable odour, resembling that produced by the larva of *P. Machaon*. Many larvæ are of an almost uniform pale ochreous-brown or clay-colour, with the markings scarcely visible.

The small larvæ feed quite exposed on the upper-side of the parsnip-leaves: the full-fed ones, however, are fond of lurking among the leaf-stalks, close to the ground. At all ages, it is very quiet and sluggish in its habits, often remaining for hours on the same leaf, and only quitting it when entirely consumed. It does not appear to be eaten by birds, and I have not bred a single ichneumon or other parasite from the considerable number of larvæ which I collected.

The pupa is about $1\frac{1}{4}$ inch in length, not very stout for one of its genus: the wing-covers scarcely project beyond the general outline. The front of the head is deeply bifurcate, and on the thorax is a very conspicuous projection, pointing forwards and a little upwards, giving to that part a somewhat hooded appearance: there is a pair of deep foveæ on either side of the abdomen, just above the wing-covers, and a double row of small projecting points down the back. Surface rough and opaque: colour light to dark wood-brown, mottled with darker, and, in many specimens, washed with opaque verdigris-green along the sides of the abdomen. It remains in this stage for about twenty days.

H. M. S. "Kingfisher," Caldera, Chile :
9th March, 1882.

DESCRIPTIONS OF THE LARVÆ OF HAWAIIAN *LEPIDOPTERA*.

BY THE REV. T. BLACKBURN, B.A.

The following descriptions of the larvæ of four of the most conspicuous and best known species of Hawaiian *Lepidoptera* may, I hope, be of interest.

VANESSA TAMMEAMEA, Kotz.

Pale green, darker towards the sides, dorsal line slender, dark green, sub-dorsal lines broad, very pale green, spiracular lines broad, yellowish-green, head green, red down the middle, legs red, claspers

green; head furnished with numerous green tubercles, each ending in a hair; on each segment, except the last, four long spines (which are yellow at base, then red, then black, then white), from each of which seven smaller white spines branch out. On the last segment are two spines (similar to the rest, but much longer) pointing backward. In the young larva the body is black, except the space between sub-dorsal and spiracular lines, which is green. Larva feeds on a large-leaved plant, three or four feet high, apparently of the nettle tribe, growing rather plentifully in open places in the woods on the mountains of the Hawaiian Islands.

HOLOCHILA BLACKBURNI, Tuely.

Onisciform; clear bright green, above the head and along the spiracular line slightly flushed with pink; along the back run two lines of pale yellow colour which almost meet on the last segment (where they are ill-defined) and diverge towards the head. The whole larva is obscurely pubescent, more distinctly so along the sides. It feeds upon the seed-pods of *Acacia fulcata* (the Koa), and, no doubt, on allied plants in various localities on the Hawaiian Islands. The pupa is pubescent, short and stumpy, attached to a leaf or seed, &c., lengthwise, by a few fine threads.

AGROTIS CREMATA, Butler.

Rather broad and depressed, especially near the head, where the larva appears more or less swollen. Very pale drab colour, the dorsal region of all the segments, except the first and last, occupied by blackish clouds which diminish in size backwards. The dorsal portion of the segments behind the head forms a horny plate, which (with the head) is obscurely testaceous in colour, but is margined with black; spiracles black, legs and claspers of the ground-colour, but tipped with blackish. Feeds on a marine plant on sand-hills on Maui, hiding under the sand by day.

RHODARIA DESPECTA, Butler.

Convex, broad in the middle and much narrowed at the ends; each segment individually also narrowed behind and in front; green, almost unicolorous, save that the dorsal line is darker; a few long hairs on each segment. Feeds in folded leaves of a large convolvulus-like creeper, which grows plentifully on the banks of streams in mountain localities on the Hawaiian Islands.

ON *NYCTEMERA BIFORMIS*, OF MABILLE, AND TWO OTHER FORMS OF *NYCTEMERIDÆ* FROM MADAGASCAR.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Nyctemera biformis (incorrectly spelt *Nichthemera* by its author) was described by M. Mabille in 1878 (Bull. Soc. Zool. de France) from specimens forwarded to him by Mr. Henley G. Smith.

In 1879 we obtained a specimen agreeing with the description of the female, a white insect with dark grey-brown borders to the wings (scarcely *nigris*, Mab.), and in the following year we added an example answering to that of the male, *i. e.*, front wings smoky-brown, with a paler semi-transparent central patch above; hind-wings white, with the basal area and a broad abdominal border, extending a little beyond the first median branch, smoky-grey or grey-brown, and with a rather broad black external border; below all the wings white, with the external borders and the internal border of the primaries smoky-brown.

Upon comparing these two specimens with one another, and with M. Mabille's description, I saw nothing to prevent their being sexes of one species, beyond the fact that no other species in the *Nyctemeridæ* shows a similar discrepancy of pattern in the sexes; the singularity of this supposed instance, moreover, was indicated by its author in the name which he gave to the species; therefore, until a few weeks back, I allowed them to stand together in the Museum series.

This year, however, we have received a female from the Rev. Deans Cowan, which corresponds with the male previously received; the only difference being that the white area on the secondaries is a little smaller than in that insect; in this respect, however, it agrees still more closely with M. Mabille's description of the male: the female of that description is thus proved to belong to a distinct species. Both forms will fall into Boisduval's genus *Leptosoma* rather than into typical *Nyctemera*.

LEPTOSOMA MABILLEI, *sp. nov.*

Nichthemera (sic) biformis, ♀, Mabille.

♀. Allied to *L. biformis*, but white: the wings with rather broad greyish-brown external borders, which become gradually narrower towards the posterior angles; primaries with a very slender brown costal margin and a broad grey-brown internal streak from near the base to the posterior or external angle; anus ochreous; pectus ochreous, with a black spot on each side; legs and venter white, the latter spotted with black; primaries below without an internal streak.

Expanse of wings, 51 mm.

Antananarivo, Madagascar.

The two following new species of the genus *Hylemera* have recently been received:

HYLEMERA CANDIDA, *sp. nov.*

♂. Allied to *H. tenuis*; snow-white; primaries on both surfaces with the apical area and external border broadly smoky-brown, its inner edge forming a slightly angular arch; a series of five white spots or dashes close to the inner edge of this border, the first (beyond the cell) placed longitudinally, the three following transversely, the fifth being a decided spot at external angle; a smoky-brown spot at the end of the cell; base of primaries, head and palpi ochreous; antennæ dark brown, rest of body slightly opaline. Expanse of wings, 30 mm.

Ankafana, Betsileo Country (*Cowan*).

This is smaller, narrower, purer in colour, and much more simply ornamented with smoky-brown than its nearest ally.

HYLEMERA NIVEA, *sp. nov.*

♂. Allied to *H. fragilis*; snow-white; primaries on both surfaces with the apical area, a discocellular spot confluent with the latter and the external border broadly greyish-black; a sub-marginal wavy white streak tapering from the external angle to the first or second median branch; base of primaries, head, collar, palpi, and coxæ, bright saffron-yellow; antennæ black; remainder of body dull sordid white; costal border of primaries below tinted with yellow.

Expanse of wings, 28 mm.

Ankafana, Betsileo Country (*Cowan*).

The absence of any oblique black costal dash, the slightly narrower external border, the white sub-marginal streak of the primaries, and the absence of a black discocellular spot on the secondaries, at once distinguish this from *H. fragilis*.

I have not seen females of any of the five Mascarene species.

British Museum:

28th June, 1882.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(*continued from vol. xviii, p. 186*).

Grapholitha cinerana, Haw.—In support of the belief of many entomologists that this form is a species distinct from *nisella*, L. Mr. Hird, of Scoonieburn, Perth, very kindly sent me, last year, a number of larvæ feeding between united leaves of aspen (*Populus tremula*). They were lively, but not very active, plump and of equal thickness, except that the anal segment was small; also somewhat flattened beneath, smooth, and rather shining. Colour very pale yellowish-green, with a dark green irregular dorsal vessel, spots invisible, hairs very delicate, head chestnut-brown, with darker eyes and jaws, dorsal plate faintly tinged with brown, anal plate hardly distinguishable. When full-fed, yellow, with brownish dorsal vessel.

On aspen, feeding between the leaves, which it unites flatly together, and does not roll or fold, but eats away the parenchyma. June. Pupa light brown, between the leaves.

All the perfect insects were certainly typical *cinerana*.

Phtheochroa rugosana.—In July last, I received from Mr. W. H. Fletcher larvæ of this species, found feeding in berries of *Bryonia dioica*, at Worthing, Sussex. They were restless, but not very active, fairly cylindrical, with wrinkled and rather swollen segments, pale yellowish-green, with delicate hairs arising from barely visible spots; head chestnut-brown, edged with blackish behind, dorsal and anal plates green, feet also green. Eating out the pulp and also the hard seeds, and leaving only the skins of the berries, which they fastened together, and sometimes the shells of the seeds. These larvæ spun tough, opaque, whitish cocoons, attached to the covering of the vessel. The pupæ were light brown. A moth emerged June 3rd.

Von Heyden describes the larva, "very thick, slightly glossy, somewhat wrinkled with whitish raised dots, each bearing one short hair, unicolorous green, head somewhat narrower than the neck-plate, which is of a darker green than the rest of the body. In July and August it spun together leaf and flower-bunches, feeding in the green seeds. Pupating in a hollowed-out part of the stem, closed with a leaf. Pupa yellowish-green, tolerably thick." It would seem, therefore, that the pupa, as well as the larva, varies in colour.

Pembroke: 14th June, 1882.

FURTHER TROPICAL NOTES.

BY W. B. PRYER, C.M.Z.S.

I note with considerable interest Mr. Champion's remarks, in your February number, on my Tropical notes. General descriptions of a country's Natural History are always interesting, and Mr. Champion might well have given us a more lengthy account of his experiences. With regard to his comparisons with my "notes," I must say that I always have understood that the Western tropics and South America are richer in number of specimens of birds, butterflies, and beetles, than this part of the world.

I should not like to be misunderstood in the meaning I wished to convey in my former letter. In stating that most travellers overloaded their descriptions of every-day tropical scenery with astonishing birds, troops of monkeys, wonderful butterflies, shining beetles, gorgeous flowers, many coloured lizards, glittering snakes, &c., &c.,

all visible at one time and place—I did not say that such scenes did not absolutely exist, but that the rare exception was being described as the rule: I have myself seen a combination of several of these items more than once; but if I had the books here I could pick out half-a-dozen in which such scenes, including the birds down to the “glittering” snakes, are printed as descriptions of what is to be seen almost daily in the tropics.

Mr. Champion speaks of the forests of the Tierra Caliente of Central America being more open than those of the East, as probably accounting for the greater quantity of brightly coloured birds, butterflies, &c., to be seen in them, and this is no doubt correct: in open rides in the forest into which the sun can shine there are here a few *Terias Junonia* or *Lycaenidæ* nearly always to be found, mostly common species, however, but it is the true primeval forest that I wrote about. As soon as one enters the high forest here, one might as well expect to find butterflies in Westminster Abbey, the interior of which is the best comparison of what the Bornean primeval forest is like that I can bring before my home-staying readers.

With regard to birds in the true forest, we have here in North Borneo as many *species* of birds and as brightly hued ones as any where in the world probably, the Pittas for instance, than which a more gorgeously coloured group of birds does not exist, and of which there are several species round this town, but the number of *specimens* is very small; there is no lack of species of animals too, but to see one is most rare (except monkeys and ‘squirrels, and these generally near plantations).

As an actual experience of the high forest I may give a recent experience. I have just returned from having been a 10 days’ journey on business in it. I saw but one butterfly the whole time I was actually in the forest, one of the *Satyridæ* with a pink tinge on the under-side, and the usual rows of rings, it was flitting about in a space a little more open than usual, owing to a large tree having recently fallen there; of other things I saw a Cullassee monkey (*S. rubicundus*), two Kalawat (Gibbon, *Hylobates*, sp.?) mother and young, an otter, and a tortoise of some 50-lbs. weight, besides a few birds; this is all. As already written I was on business, had I been collecting I would have kept to some old clearings close by, and there got plenty of butterflies and birds amongst the deserted fruit trees.

I notice that Mr. Champion writes that one does *not* find all the gaily coloured birds, insects, &c., at once, still they are there, *and in a residence of a few months* one becomes acquainted with them (the

italics are mine), he confesses himself "greatly disappointed with his first impressions," but after a long residence, his opinion has greatly changed, and he can confirm my experiences but in one particular. On the contrary, I think these admissions prove all I have written.

As for the tropical primeval forest, on some minds, and mine I confess is amongst the number, it exercises a strong and never-fading fascination. The enormous columnar tree trunks springing straight up branchless and curveless for 120 or 150 feet, the tightly pressed canopy of leaves overhead like an enormous roof, through which not a ray of the sun finds its way, the enormous buttresses to many of the trees, most of the spaces between two of which are large enough for a fairly big apartment if covered in, the strange creepers varying in size from thread-like stems with leaves not so big as ones nail and frequently variegated, to large species with three or four stems each a foot thick joined by rings, holding large forest trees in their tight embrace and rapidly strangling them, while their own cram of leaves high overhead is mixed with that of its victim, the ground covered with mosses large as English ferns (*Caladium*), some of them variegated in the most extraordinary way, others with leaves three or four feet across, Arums springing up higher than ones head, dwarf palms of the most exquisite beauty and of numberless species, the strange Nepenthes, and an infinity of other curious and beautiful forms of vegetable life, while clinging to the tree trunks are to be seen endless orchids and parasitical ferns, all of tiny forms close to the ground but increasing in size-higher up, till the remarkable elk- or stag-horn fern is to be seen high overhead, their strange fretwork leaves dangling down a dozen feet below the plants themselves, one of which if taken down would be nearly a cart load of itself; more than all in impressiveness is the gloom, the solemn silence, and the coolness, all these things give a strange charm to the true forest.

But there is no animal life visible or insect either, besides termites and ants, except quite occasionally.

The tropics are rich in species but poor in specimens, offering no comparison in the latter respect to many large districts in the temperate Zone that I know of, either as to profusion of birds, insects, or reptiles, but the superior attraction to a true lover of Nature and not a mere collector rests with the tropical forest for all that.

In looking at collections made in the tropics, it must not be forgotten that in most parts out here there are some 350 days or thereabouts in the year during which the enthusiastic Naturalist can collect.

CHARACTERS OF NEW GENERA AND DESCRIPTIONS OF NEW
SPECIES OF *GEODEPHAGA* FROM THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

(Resumed from p. 229, vol. xvii.)

V.

ANCHOMENIDÆ.

CYCLOTHORAX.

C. KARSCH, *sp. nov.*

Convexus, nitidus, ater, marginibus pedibusque obscure rufescentibus, antennis palpisque testaceis; capite mediocri; oculis prominulis; antennis corporis dimidio plane brevioribus; prothorace subquadrato vix transverso, antice haud emarginato, basi utrinque foveolato, trans basin punctato, unguis posticis subrectis; elytris elongato-ovalibus, fortiter striatis, stris (marginem apicemque versus deficientibus) fortiter punctatis, interstitiis convexis, humeris rotundatis.

Long. $6\frac{1}{2}$ mm.

A single specimen occurred to me among loose stones on Mauna Loa, Hawaii, at an elevation of about 6000 feet.

I feel some doubt about the generic position of the subject of the above description. It is clearly a member of the *Anchomenoid* series; and I am unable to detect well-defined structural characters to separate it from *Cyclothorax* (in which genus I therefore place it provisionally); but it will be desirable to point out (*a*) that the slight elevation of the prosternal process between the anterior coxæ (Ent. Mo. Mag., vol. xvi, p. 109) is scarcely to be traced in this insect; (*b*) that superficially it differs considerably in appearance from any *Cyclothorax* yet known to me, inasmuch as it might be compared to one of the most elongate species of that genus, furnished with the thorax of *Pterostichus minor*, Sahlb.

The Berliner entom. Zeitschrift, Bd., xxv, 1881, contains a paper by Dr. F. Karsch on the *Coleoptera* that Dr. O. Finsch collected in 1872 on the Hawaiian Islands and elsewhere. The learned author, probably, had not seen my series of papers on Hawaiian *Carabidæ*, since some of the species he describes as new are evidently identical with some previously described by me. I may observe that Olinda—where most of Dr. Finsch's insects appear to have been taken—is a locality in which I have collected at various seasons of the year, and with the ordinary insects (at least) of which I am fairly well acquainted. I venture the following remarks on Dr. Karsch's species and determinations.

Acupalpus biseriatus, Karsch. This seems to be identical with

my *Cyclothorax cordaticollis* (Ent. Mo. Mag., vol. xv, p. 156), though there is a slight discrepancy in respect of size: I having stated it as "Long. $4\frac{1}{2}$ —5 mm" (I have since taken a specimen 6 mm.), and Dr. Karsch "5—7 mm;" and also the linear punctuation near the suture is stronger, according to Dr. Karsch, than as characterized in my description. In a recently procured series, however, I observe that it varies somewhat in intensity.

Platynus planus, Karsch, is apparently my *Anchomenus erro* (Ent. Mo. Mag., vol. xv, p. 151). The Doctor's description is, however, puzzling. The "*humeris productis*" of the Latin diagnosis becomes, in the German description, "*die schultern gerundet*;" again, *P. planus* is distinguished from *P. albipes*, Fab., "*durch den hinten stärker verschmälerten Prothorax*," but, further on, it is said of the prothorax, "*hinten plötzlich, doch nicht stark, verschmälert*." The only difference worth notice between my description of *A. erro* and Dr. K.'s of *P. planus*, consists in my "*prothorax leviter transversus*," while the doctor has "*longior quam latior*." Careful measurement of a series of specimens of *A. erro* gives the following result: the proportion of the greatest width of thorax to length down central line is as 20 to 19 [this is my usual way of measuring]; greatest width of thorax exactly equals greatest length—which occurs a little on *either side* of the central line.

Colpodes octoocellatus, Karsch, is obviously my *Anchomenus Sharpi* (Ent. Mo. Mag., vol. xv, p. 122), although my description has "*angulis humeralibus rectis*," and Dr. Karsch's "*humeris rotundatis*." In describing, I compared the insect with its ally, *A. rupicola*, Mihi, in which the sides of the elytra are rounded into a curve continuous with the base (whereas, in *Sharpi*, they are straight, and, speaking roughly, at right angles with the base), but I acknowledge that the actual corners themselves are rounded off.

Anisodactylus cuneatus, Karsch, seems to agree exactly with my *Atrachynemis Sharpi* (Ent. Mo. Mag., vol. xv, p. 120), as does *Promecoderus fossulatus*, Karsch, with *Disenochus terebratus*, Mihi.

The two species of *Carabidæ* that I have observed most commonly near Olinda are my *Cyclothorax scaritoides* and *montivagus*. These do not appear to be the subjects of any of Dr. K.'s descriptions, but I observe in his list of previously described species taken by Dr. Finsch at Olinda, *Oopterus plicaticollis*, Boisd., and *Olisthopus insularis*, Motsch. Now, it happens that my *C. scaritoides* is so much of the general aspect of *Oopterus*, that I went to the trouble of hunting up *O. plicaticollis* long ago, in the "Voyage au Pôle Sud," and satisfied

myself that it differed from it (in which conviction I still remain after careful examination), and that my *C. montivagus* is so closely allied to *O. insularis*, Motsch (which species I have in my own collection from New Zealand), that in describing it I thought it well to point out wherein it differed from the latter. This suggests strongly to me the idea that Dr. Karsch and I have, in this instance, the same two insects in view, and that we have arrived at different conclusions concerning them. A renewed examination of the matter leaves me still quite satisfied with my determination of them as new. My descriptions will be found in Ent. Mo. Mag., vol. xv, pp. 122 and 156.

The fact that I suppose Dr. K. and myself to have referred the same insect to different genera will not appear strange to any one who has worked at Polynesian *Carabidæ*; indeed, a reference to Lacordaire's remarks, in the "Genera des Coléoptères," on the genera concerned, will show that their affinities were subjects of perplexity to that author himself.

Cathedral Close, Honolulu :

3rd June, 1882.

DESCRIPTION OF A SPECIES OF *PSYLLIDÆ* RECENTLY NEW TO GREAT BRITAIN.

BY JOHN SCOTT.

TRIOZA CRITHMI, F. Löw.

Verh. z.-b. Ges. Wien, p. 556 (1880).

Overwintered examples.—♂ black. *Head* black; *crown* about twice as broad between the eyes as the length down the centre, the margin white, a little higher than the disc, on each side of the central channel a short longitudinal whitish line, disc near the base with a somewhat deep fovea, slightly curving in the direction of the eyes. *Face-lobes* perpendicular to the crown, white, stout at the base, clothed with a few fine white hairs. *Eyes* dark purple-brown, posteriorly with a narrow white margin. *Antennæ* black, 1st, 2nd, and 3rd joints fuscous-white, 2nd narrowly blackish at the base, 3rd longest, about $1\frac{1}{2}$ times longer than the 4th.

Pronotum white, with a black puncture near the extremities; *mesonotum* black, dull, anterior portion (dorsulum) with a very fine, longitudinal, brown, central line, central portion with four lines placed one on each side of the centre, and another a little remote from the last, extremities brown, apical or scutellar portion black. *Elytra* transparent, with an extremely faint brownish tinge, marginal nerve brown. palest next the base, apex narrowly rounded, length about $2\frac{1}{2}$ times that of the breadth, greatest breadth across the inner branch of the dorsal fork of the cubitus, radius long, straight from the base to beyond the middle, where it slightly but perceptibly curves towards the costal margin, the distance between the apex of the radius and the upper branch of the adjoining furetion, which joins the marginal

nerve just above the apex, about $1\frac{1}{2}$ times as great as the distance between the branches of the furcation measured on the marginal nerve, the distance between the latter and the outer branch of the lower furcation about equal, measured as above; nervules short, brown. *Legs* fuscous-white, or yellow-white; *thighs*: 1st pair with a broad black, longitudinal streak down the upper-side; *claws* blackish.

Abdomen black, genital plate yellow, sparingly clothed with short, pale hairs, anterior margin convex, sides produced into a long tooth or tongue-like piece, reaching to beyond the apex of the processes, the latter dark brown viewed from the side, about three times as high as broad at the base, outer margin convex, inner margin slightly concave.

Summer brood.—♂ orange-yellow. *Crown*, margin and pronotum as in the above. *Legs* yellow. *Abdomen* green or yellow, with the last two or three of the segments sometimes black in the middle of the upper-side. All the other characters as in the overwintered examples.

Length, $1\frac{1}{4}$ line (Paris).

Ova orange-yellow, longish-oval or fusiform, each set on a peduncle about $2\frac{1}{2}$ times its length, disposed irregularly, singly, or in pairs on the upper- or under-side of the leaves of the samphire; as they approach maturity, the base assumes a reddish-orange colour, and they may frequently be observed waving from side to side, or swaying backwards and forwards. When close on hatching, they become entirely of a dull reddish-orange colour, and the peduncle is bent down until it touches the surface of the leaf, where it remains until the young larva has made its exit.

Larva orange-yellow throughout all its stages, somewhat oval, flat, sluggish, with a narrow border of glittering white hairs.

Nymph pale orange-yellow, or with the abdomen green, flat, entire margin with a border of glittering white hairs, longest at the extremities, where they appear pectinate. *Head* broad, anterior margin notched in the middle, extremities rounded, disc with four short, longitudinal channels between the eyes, not reaching to the anterior margin narrowly rounded, almost in a line with the anterior margin of the head. *Legs* pale yellow.

This species was originally taken on *Crithmum maritimum* by Dr. A. Puton, at Roscoff and Morlaix (Finisterre), towards the end of June; and, from Dr. F. Löw's description, made from specimens sent to him by the discoverer, I believe these to have been of a newly-hatched brood. Here it has been taken in all its stages, at Anstey's Cove Rocks, near Torquay, by P. H. Gosse, Esq., F.R.S., who most kindly forwarded me many examples, from which the above description has been made, together with the following vivid note of his successful search:

"Anstey's Cove, in the neighbourhood of Torquay, is divided into two by a projecting promontory. The northern of the two, which is the nearer to Babbicombe, has a fine beach of white limestone pebbles. At the rear, the limestone has fallen from the lofty cliffs in great cubic blocks, as big as a small cottage or a railway carriage, which now lie on the shingle, or on the sloping *débris*. From crevices in these blocks, from beneath their bases, and from the ground between, even from amidst the white pebbles, the Samphire is now shooting up (April, 1882) in dense

tufts, from the old gnarled stems of last year, the young shoots already six or eight inches high, and carrying half-a-dozen of the compound succulent leaves, or more.

Peering among the tufts, on the 14th, I espied, on some of the leaves (usually on the back of the lowest leaflet) a minute orange-coloured speck, which, under a pocket lens, appeared to be an ovate shield or scale, convex above, but adherent below by its entire surface to the leaf, each furnished, at its extremities, with a horizontal fringe of close-set parallel straight styles, like the teeth of a comb, of glittering whiteness. These shields are perhaps .05 or .06 inch long, judged roughly.*

While I was examining these, wondering whether they might be pupæ of the desired *Trioza* or not, I became aware of a number of other minute entities, scattered about the mid-ribs and the leaflets of the *Crithmum*; so minute as to be only just discernible, when seen edgewise against a dark background. These were oblong egg-like bodies, of orange-yellow hue, elevated each on a slender white pedicel, about thrice its own length: the pedicel standing up stiffly and perpendicularly from the leaf, and carrying at its summit the egg (?) affixed obliquely by its end; reminding me of the ova of the *Hemerobiadæ*.

The shields (pupæ?) are by no means rare: and these pedunculate eggs are even more numerous; but always single and isolated, so far as I observed.

But scarcely had these been noticed, before I caught sight of a little Aphis-like fly, with ample glassy wings, deflexed, and teetiform, yellow fore-parts, and bright green abdomen, crawling on the mid-rib of a leaf. I endeavoured to secure it in a pill-box; but it was wide awake, and the handling of the plant, cautious as I was, alarmed it, and caused it to vanish. Another I succeeded in boxing, with a bit of leaf; but trusting to its quietude, I left the box uncovered, that I might more easily secure the next I saw. The stillness proved treacherous, however; for in a few moments, looking, I found it had flown. But I did succeed in bringing home two examples; which, with examples of the other forms, I despatched, by post, to Mr. Scott, the same evening."—*April 15th*, 1882.

Lee: *1st May*, 1882.

P.S.—Since writing the foregoing, on the 24th ult., I have observed the exit of a few of the infant larvæ from the egg in its upright position on the peduncle, and I am, therefore, not certain that the mode stated above is a true one, because by my examining the contents of the bottle, some of the leaves may have fallen on others bearing the eggs, and thus have produced the result I there witnessed. It will, therefore, be necessary for further observation to determine which of the two modes is the natural one.—J. S.

* As I sent away to Mr. Scott, by post, immediately on my arrival at home, all that I had gathered that day, these observations were, of necessity, very hastily made, and contained many mistakes. I afterwards found that the "ovate shields" were not adherent, as I had supposed, but were perfectly mobile, wandering larvæ, with six short legs, crouching close and flat to the leaf, but ready to crawl rapidly away, when disturbed. I found them, too, of various degrees of development; some not appreciably larger than the pedicelled ova, whence they had been doubtless just hatched, and some fully .1 inch long. From the fact that some of the largest had the abdomen of a rich green hue, and a pair of over-lapping plates developed hindward from each side of the thorax, which I conclude to be the wing-sheaths. I presume these to be pupæ; but they were active and locomotive as the others.—P. H. G.

Distribution of the genus Platypheura: a correction.—In the report of the Proceedings of the last meeting of the Entomological Society of London (*ante* p. 48) I am described as having "alluded to the genus *Platypheura* as occurring nearly all over the world." I certainly did not make this statement, as the genus is absent from the Nearctic, Neotropical and true Australian regions. Its area, however, is still extensive, the tropical parts of Africa and Asia being its head quarters, though in the first it is found as far south as the Cape, and in the second as far north as China. It is also found throughout the Malayan Archipelago. What I ventured to observe in my paper, as read by the Secretary, was this: "The more we see of the Rhynchotal fauna of Madagascar, the greater is the amount of structural specialization apparent, and its distinct character revealed. This is particularly the case with the *Cicadidæ*, and every species of the widely distributed genus *Platypheura* which has yet been received from Madagascar has also proved new to science."—W. L. DISTANT, East Dulwich: 1st July, 1882.

Eupteryx vittatus, Linn.—In a shady corner of my garden grows a patch of ground-ivy (*Nepeta glechoma*) about two yards square, and on this, at this time, *Eupteryx vittatus* is not uncommon. I have no doubt, seeing the pupa-skins are there, that this is the food-plant of the species, which, although often found in woods and other places among herbage, has not, as far as I can discover, ever been identified with any particular food-plant. It probably feeds on other *Labiata*, as do other species of the genus, but, whether or not, its association with this plant is worth noting as an addition to a group of allied species of insects correlated in attachment to related species of plants, whether by their respective evolution or not.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 8th July, 1882.

Occurrence of Molanna palpata, McLachl., in Perthshire.—I have just taken a few specimens of the above caddis-fly at Lochan Creag Madaidh on the Glen Lyon hills; the level of the Lochan is about 1750 feet above the sea.—JAMES J. KING, Fortingal, Perthshire: 3rd July, 1882.

On Scymnus Redtenbacheri, Muls., an additional British species, and some other British Coleoptera.—Among some doubtful beetles from the collection of Mr. Wilkinson, of Scarborough, now in the possession of Mr. Mason, of Burton-on-Trent, I found a specimen of a *Scymnus* that I could not determine. M. Brisout de Barneville has kindly named it for me as *Scymnus Redtenbacheri*, Muls. (*bisignatus*, Boh.), a species new to the British list. Mr. Mason has since found several more specimens under the name of *S. limbatus*, and it is quite possible that Mr. Wilkinson may have distributed the species as *S. limbatus*. *S. Redtenbacheri* is, however, very distinct from the true *S. limbatus*; in fact, it belongs to a separate group, *Nephus*, Mulsant, of which we have only one representative, *S. quadrilunatus*, Ill., which has been struck off the British list, although there seem to be one or two specimens extant that rest on good authority.

S. Redtenbacheri is a small insect ($\frac{3}{8}$ lin.), of long-oval shape, with long grey pubescence, sometimes entirely black, but usually with a longitudinal curved band of a red or yellowish-red colour on each elytron; all the specimens I have seen possess this band; the legs are entirely of a pale yellow colour.

I have only a single specimen of *Scymnus limbatus* (the only one of our generally received species with which it can be confused) to compare with *S. Redtenbacheri*; this is a type specimen from Mr. Rye's collection, kindly lent me by Mr. Mason: the two species may at once be distinguished by their very different shape, and by the colour of their legs; according to Mulsant, this latter character is not always to be depended upon, but it is most marked in the specimens before me, *S. limbatus* having dark pitchy legs with yellowish tarsi, and the legs of *S. Redtenbacheri* entirely of a light yellow colour; the almost round shape of *S. limbatus*, however, compared with the long-oval shape of *S. Redtenbacheri*, affords a character by which the two species can be easily distinguished.

There are two other species of *Scymnus* which have been put forward for a place in the British list, viz., *S. lividus*, Bold, and *S. arcuatus*, Rossi.

The claim of the former species rests on a single example found on the Northumberland coast by Mr. Bold, which, from the description (Ent. Annual, 1872, p. 91), will probably turn out to be only a variety of one of the known species, which are very variable.

With regard to *S. arcuatus*, a single specimen was brushed out of old ivy near Market Bosworth by Mr. Wollaston, who had previously found it in some numbers in Madeira. It is placed in the European list between *S. Guimeti*, Muls., and *S. impexus*, Muls. It appears to be a very distinct species, "the elytra having in common two horse-shoe shaped whitish-yellow lines, open towards the front, and of which the lower encloses the upper" (Ent. Annual, 1873, 33).

Many of the *Scymni* are so obscure, and apparently vary so much, if we may judge from Mulsant's long descriptions (Coléoptères de France, Scymnieri. pp. 210—266), that it is quite possible we may have several more of the described European species in Britain.

While mentioning Mr. Bold's *S. lividus*, it may perhaps not be out of place to ask if any Coleopterist knows what has become of Mr. Bold's collection. *Anchomenus quadripunctatus*, De G., and *Tachys quadrisignatus*, Duft., rest, as British, on single specimens taken by Mr. Bold very many years ago. There is no reason why a species should not be admitted on a single specimen; but if, after the lapse of a large number of years, no further specimen has been found, it is but reasonable to conclude that in some way or other the species may have been imported, or that some mistake may have been made. With regard to *Tachys quadrisignatus*, it appears to be quite probable that, after all, Mr. Bold's insect may be a light variety of the common *T. bistriatus*, especially as the former insect, according to Du Val, is very variable.—W. W. FOWLER, Lincoln: July 7th, 1882.

Polystichus vittatus and other *Coleoptera* near *Hastings*.—I have pleasure in announcing that I have taken a single example of the former at Pett beach, a locality certainly seven miles from Bopeep. Although I worked hard for about two hours, I failed to get more. My brother, Mr. H. F. Collett, obtained for me *Trox sabulosus* by turning up the soil under a dead rabbit, in Guestling Wood. I am just now taking *Athous difformis* plentifully of an evening under my dining room window. One evening, between 8.30 and 9.30, I got as many as 14!—E. P. COLLETT, St. Leonards-on-Sea: July 18th, 1882.

Note on Oodemas ænescens, Boh.—I observe that, according to Dr. Karsch, *Oodemas ænescens*, Boh. (*Cossonidæ*) occurred to Dr. Finsch at Olinda. Is it possible that "Olinda" is here a misprint for "Honolulu," whence Boheman states that he procured the species? I have taken several species of *Oodemas* at Olinda (*vide* *Annales de la Société Ent. de Belg.*, 6th July, 1878, and *Ent. Mo. Mag.*, vol. xvii, p. 199), but not *ænescens*. If it be really a fact that Dr. Finsch took on Maui the veritable species obtained by Boheman near Honolulu, the certainty that such was the case would possess the deepest interest for me, as my experience goes to show that no species of the genus is common to Oahu and the southern islands of the group.—T. BLACKBURN, Cathedral Close, Honolulu : 3rd June, 1882.

Dipterous larvæ in the human subject.—In compliance with the request of your correspondent, Mr. William E. A. Axon, in the July number of the Magazine, p. 45, I beg to refer him to the following sources of information on the subject in which he is interested: the Medical Press and Circular for March 15th, 1882, p. 238; the number of the same for April 5th, 1882, p. 304; ditto, April 12th, pp. 314 and 325; ditto, April 26th, p. 368.—J. A. OSBORNE, M.D., Milford, Letterkenny : 1st July, 1882.

A day's larva-collecting in the New Forest.—Whilst on a visit to Lyndhurst at the end of last month, I had the opportunity, in company with my friend Mr. Freeman, of Plymouth, of having a day's larva-collecting in the vicinity. It was evident, from the denuded state of the trees, that larvæ were abundant, and such proved to be the case.

Oak produced a number of miscellaneous larvæ, the most noteworthy being *Liparis monacha*, *Nyssia hispidaria*, and *Cymatophora ridens*, all commonly; the lichen-covered branches, a few *Lithosia quadra*; beech, the young larvæ of *Demas coryli*; and the stunted sloe bushes, *Thecla betulæ* and *Aleucis pictaria*.

The most interesting larva, however, which we beat out was dislodged from a large oak in the open forest. The larva resembled, in a marvellous degree, a piece of detached lichen, and we were both at first glance much puzzled as to the species. On close examination we were of opinion that it was the larva of *Catocala promissa*, and Mr. Buckler, to whom we sent it, recognised it as one of the varieties of that species figured by Hübner.

In the afternoon we entered one of the enclosures for *Limenitis Sibylla* and *Argynnis Paphia*. After a diligent search we found two full-grown larvæ of the former, both resting on the upper-surface of leaves of honeysuckle. The larvæ of *Argynnis Paphia* were by no means scarce, crawling over the dead leaves in open places, in search, no doubt, of their food plant; and, to judge from the way in which the violets were eaten, the larvæ must, at an earlier date, have been indeed abundant. Mr. Freeman found a pupa of this species suspended from a piece of honeysuckle whilst searching for the larvæ of *L. Sibylla*. I may remark that perfect insects were extremely scarce.—A. H. JONES, Shrublands, Eltham : 19th June, 1882.

Carposina, H-S., referable to the Tortricina.—Whilst recently investigating a peculiar group of the *Conchylidæ*, which is represented by several genera in Australia

and New Zealand, I happened to discover that the European genus *Carposina*, H.-S., usually placed amongst the *Gelechiidæ*, is truly referable to this same group. That it does not belong to the *Gelechiidæ* is sufficiently proved by the separation of veins 7 and 8 of the fore-wings, which in the *Gelechiidæ* and *Ecophoridæ* are invariably stalked; the long straight porrected palpi and peculiar venation of the hind-wings also remove it from those families.

The group of the *Conchylidæ* in question is represented in Australia and New Zealand by the genera *Paramorpha*, *Heterocrossa*, *Bondia*, *Oistophora*, and *Coscinoptycha*. All these agree in the following characters, viz.:—the fore-wings have 12 separate veins; the hind-wings have only 6 veins, of which 3 and 4 rise from a point or short stalk, 5 from upper angle of cell, 6 free; the fore-wings are unusually elongate and narrow, always with tufts of raised scales; the hind-wings are unusually pointed, and the cilia often long. *Carposina* exactly accords with these characters, except that veins 3 and 4 of the hind-wings appear to be separate, which is, indeed, the only point of generic separation from the genera mentioned. The long porrected palpi (differing somewhat in the sexes, as also in others of the genera) and the rather peculiar costal strigulae are additional points of resemblance, which make the relationship unmistakable. In superficial colouring and marking the species very closely resemble *Paramorpha* and *Heterocrossa*.

The species of this group are so curious, and at first sight so little suggestive of the usually broad-winged *Tortricina*, that it may be necessary to explain that there is another Australian group, represented by the genera *Helicocoma* and *Hyperxena*, which affords a clear transition to the ordinary type of the *Conchylidæ*.

The relationship of *Carposina* to the Australian fauna is so interesting that I thought it worth while to point out the mistake made in its location.—E. MEYRICK, Christchurch, New Zealand: April 20th, 1882.

On some Hymenoptera of the sandy districts of Hungary.—In the description of the insect-fauna of the spring I mentioned that the air was but little animated, but now (summer) the case is altered. Buzzings, chirpings, creakings—the mingled hum of the swarms of insects all around—are fit to put an entomologist, especially a Hymenopterist, into a state of ecstacy. He should have a hundred hands not to miss anything of value. The heat is indeed excessive, on the colder spots 40° Réaum., or more; the sand burns the hand laid on it to such a degree that it is involuntarily withdrawn; there is no shade, not the smallest cloud on the deep blue sky, and yet the condition is not intolerable. On the contrary, one breathes free and easy, for although the air is very hot it is very dry; the pores of the skin are fully active, and by the rapid evaporation of perspiration the skin is always cool; and I can truly say that to me the excursion to these steppes did not differ from a stay at a bathing place, for I left the place, after six or eight weeks, mentally and bodily invigorated and refreshed.

Scarcely have we put a foot on the sand when we are surrounded by *Bembex olivacea*, F. This grand white species of *Sphegidæ* follows us everywhere in our walks. It flies round us, its circuit becoming always smaller, and finally it settles on our coat. Its tone is a monotonous plaint, just like that of *Eristalis tenax*. As we proceed onwards the *Bembex* circles round us more and more, flying about like

white snow-flakes. Soon they settle on our sleeves, shoulders, and back; and yet one cannot capture them, for they parry every motion of our net aimed at them. They are also very wary when on their favourite flowers—*Euphorbia Gerardiana*, *Centaurea arenaria*, *Eryngium campestre*, and *Marrubium peregrinum*.

They are most easily caught in the vicinity of their nests. If one comes to a place quite destitute of vegetation, where the yellowish-white ground covered with loose sand has in it a hundred or more holes side by side, there is the colony of *Bembex*. They place themselves at the mouth of the holes, and with an invisible yet fabulously rapid motion of the feet throw the sand backwards, so that it appears as if blown by bellows, and it falls down in the form of a streak about a span wide. Their prey is always a Dipteron. One has here nothing more to do than to scatter the sand with his feet, so that the holes are covered, then the home-comers cannot easily get to their nest, and betake themselves to digging. More continue to come home, and soon a whole swarm like snow-flakes flies hither and thither. Now I seize the net, strike rapidly about ten times, swinging it backwards and forwards close to the surface of the ground. By such means the capture does not fail, and it is also announced by the plaintive tones in the net.

Other species occur, but they cannot be taken in this manner. Here *Stizomorphus tridens*, F., makes its nest, and among them, here and there, the deceptively similar *Larra hungarica*, Fried.: they can only be captured when sedentary on the ground. Both species always prey on *Homoptera* and have an entirely similar mode of living. *Stizomorphus tridens* occurs in greater number, *Larra hungarica* only sparsely. We stir not hence being in expectation of catching a splendid Chrysid. We look with watchful eyes on the sand and are happy when we see a dark-looking fly approach with slow flight. It alighted on the hole of a *Bembex* and quickly glided in; it soon returned and sat for some seconds at the mouth of the hole until it was expelled by a returning *Bembex*; then it arose with a heavy flight about a metre high and settled two or three paces off on the sand. We cautiously approach it with the net but it flew farther away; fortunately it cared not for further flight but remained still near at hand; finally we got near enough and were able to throw the net over it. As soon as it felt our fingers it rolled itself up and feigned death. Now we were able to give a glance at it:—it is the ♀ of the splendid Chrysid *Parnopes carneus*, Rossi, which is parasitic on *Bembex*. Mostly only the ♀ is obtained; the ♂ (which has more abdominal segments) is found earlier on the flowers of *Centaurea arenaria* and thistles, but is always very scarce. Once, at the end of August, I found a ♂ in a *Bembex* nest engaged in pairing.—PROF. KARL SAJÓ, in Entomol. Nachrichten: January 1st, 1882.

Reviews.

MATABELE LAND AND THE VICTORIA FALLS: a Naturalist's Wanderings in the Interior of South Africa. From the letters and journals of the late FRANK OATES, F.R.G.S. Edited by C. G. OATES, B.A. London, 1881.

It is only of late years that books of travel have contained more than an occasional passing reference to Natural History, or at least to Entomology; but at the present day, it is not often we take up one from which some useful information

respecting insects may not be derived, while many, like the work before us, will always retain a permanent scientific value.

Frank Oates, whose last travels are recorded in the present work, when a young Entomologist was settled at Leeds, he afterwards became a student at Oxford, where he showed a great taste for out-door exercise and Natural History. After several premonitory symptoms, his health gave way to such an extent as to compel him to renounce his hopes of a successful University career; and on his partial recovery, he undertook his first journey out of Europe to America, where he spent a year, travelling chiefly in Guatemala and California. Soon after his return from America, he set out again for South Africa, with the fixed intention of reaching the Zambesi. During the early part of his journey, he was accompanied by a brother; but afterwards he travelled alone, or with such European travellers as he chanced to encounter. Unhappily he was detained in the country two years, by the stolid opposition of the natives, before he was permitted to visit the Falls, of which, however, he gives no account, though he took some striking sketches. He saw the falls to great advantage; but having been obliged to visit them during an unhealthy part of the year, he was attacked by fever shortly afterwards, and died at a few days' journey on his homeward route.

The account of his journey is compiled by one of his brothers from his notes and journals. He made extensive collections and sketches, and the book is illustrated by numerous coloured plates and woodcuts of scenery, and natural history; and the appendix occupies a third of the volume, including Ethnology by Dr. Rolleston, Ornithology by R. B. Sharpe, Esq., Herpetology by Dr. Günther, Entomology by Prof. Westwood, Botany by Prof. Oliver, and a list of Mahalaha Words and Phrases from F. Oates' note books. The section of Entomology, which is what chiefly concerns us here, consists of a complete list of the butterflies taken (72 species), an account of the more important moths, and general notes of the insects of other orders, with notices and figures of three new beetles, and the Tsetse Fly. This appendix includes 65 pages of text, three beautifully executed coloured plates, and one plain plate, representing details of external anatomy. The body of the work likewise contains occasional references to Entomology; thus the plate opposite p. 143 shows on one side a native oven, formed of a termite-hill, the lower portion of which is hollowed out, and filled with wood, which is set on fire, and when consumed, renders the receptacle an admirable oven, retaining its heat for a great length of time. On p. 135 a woodcut is given of a termite-hill which was no less than 18 feet high.

THE STUDENT'S LIST OF BRITISH COLEOPTERA. Mr. Pascoe sends us the following: "In your review of my little work, 'The Student's List of British Coleoptera' (p. 46 *ante*), you say 'our author is very severe on writers of 'unrecognisable' descriptions;' but the reasons given in a note, which related exclusively to the older writers, are that they were 'made without a knowledge of allied species,' and that 'the most important points of structure remain unnoticed.' I did not complain of 'writers utterly incompetent,' nor of others 'fully competent' who failed to impart their knowledge to others. I did, however, complain of descriptions '*pour prendre date*,' the writers, I believe, confiding to the protection of an *absolute* rule of priority whereby the most diagnostic notice serves the purpose."

A PROBABLE CLUE TO THE HABITS OF *CHAULIODUS*
INSECURELLUS, STANTON.

BY H. T. STANTON, F.R.S.

I do not know whether there have been any recent captures of this insect, but so far as I am aware it has never yet been bred.

The possible habits of the larva have long occupied my attention, but it is only within the last twelve months that I have attained a fresh idea as to its mode of feeding.

I may premise that the earliest known captures of *Chauliodus insecurellus* were erroneously recorded in the Zoologist for 1848, p. 2035, under the name of *Chauliodus Illigerellus* (a very different and much larger insect); the two specimens which formed the subject of that notice "were taken by Mrs. Stanton and her sister, on the downs near Stoats' Nest, on the 31st July, 1847," and I then added, "I am unable, not having caught them myself, to speak with certainty as to what plant they were beaten out of, but most probably out of the junipers, as we thrashed the junipers most assiduously for *Cochylis rutilana*, of which I was fortunate enough to obtain five. Mr. W. Shepherd also took a specimen of this insect off the junipers at the same place, the following week."

In preparing my first Catalogue of British Tineidæ and Pterophoridæ (published in 1849), I realized that these little specimens of a *Chauliodus* taken at Stoats' Nest were not the veritable *Illigerellus*, and I proposed for them the name of *insecurella* (in this Catalogue they stand in the genus *Elachista* under section A). I then mentioned that I had again met with it on the downs at Stoats' Nest, August 16th, 1848, but was still uncertain as to the plant that it frequented.

I have no record of the number of specimens I caught on that occasion, but two of those captures and the two specimens of July 31st, 1847, are the sole representatives of the species now existing in my collection. During a period of 34 years I have made no fresh captures of the insect.

The description which I gave in the Zoologist for 1848 (not having then fine specimens before me) is of little use, and unfortunately I am hardly better satisfied with the description in the *Insecta Britannica* volume, for the points of distinction on which I am now disposed to lay the most stress are not there alluded to.

Of late years several new species of the genus *Chauliodus* have been described by the German and French Entomologists, and in

Staudinger-Wocke's Catalogue, Herrich-Schäffer's *Ch. dentosellus*, fig. 967, V. p. 208 is given as a synonym of my *insecurellus*, an opinion I am not prepared at present to endorse.

One, however, of the recent novelties, *Chauliodus iniquellus*, described by Wocke in the Stettin. ent. Zeitung, 1867, p. 209, from specimens found near Breslau on the flowers of *Athamanta oreoselinum*, in the middle of July, seems to come so near to *insecurellus* that I thought it possible they might prove identical, I am, however, now of opinion that this is not the case.

In August last year, Monsieur A. Constant, who is now settled at Golfe Juan (not far from Cannes), sent me a box of Micro-Lepidoptera for determination, and amongst the species sent was *Chauliodus iniquellus*, which he said he found in the larva state in September feeding on the seeds of *Peucedanum officinale* and *cervaria*, but remaining in the pupa state all through the winter, spring, and summer, the moth not appearing till the following month of August.

In my reply I mentioned this and *Ch. strictellus* as species in which I was much interested, and on the 27th October, Monsieur Constant having just returned from an excursion in the Estérel mountains between Cannes and St. Raphael, very kindly sent me some pupæ of both these species, remarking that I might expect the *strictellus* to emerge very soon (which they did on the 6th and 8th November), but that for the *iniquellus* I must have patience, as the moths would scarcely appear before August, 1882. He accounted for this extreme difference of habit owing to the larva of *iniquellus* feeding only on the seeds of *Peucedanum*, late-flowering plants which do not blossom till near the end of summer, whereas *strictellus* is not restricted solely to *Peucedanum* but feeds also on other umbelliferæ (such as *Ferula*), which are in full vegetation at the end of October, so that the perfect insects have no difficulty in finding opportunities of depositing their eggs.

These pupæ of *iniquellus* I kept indoors in a cool place throughout the winter and on the 7th of July, when starting for a tour in Scotland I took them with me; true to their appointed time the first appeared July 19th, two more July 29th, two others August 6th, and two others August 12th after my return home, I have, therefore, now before me a series of *iniquellus*, of my own setting, which I can better compare with my specimens of *insecurellus*, and I come to the conclusion that the two species are undoubtedly distinct.

It is notorious to any one who has devoted a little attention to this genus that some of the species have the anterior wings more or

less falcate, such as *Illigerellus* (to which Haworth gave the name of *falciformis*) and *chærophyllellus*, whereas in others, as *pontificellus*, *ochreomaculellus*, &c., the hind margin is more or less rounded. Now *iniquellus* belongs to the latter, *insecurellus* rather to the former section; at any rate, the hind margin of the cilia from the apex appears straight and not at all rounded at the apex as in *iniquellus*.

In *insecurellus* the basal portion of the anterior wings seems decidedly paler than in *iniquellus* and contains three black dots (not mentioned in my previous descriptions) placed thus: one on the subcostal nervure, one beneath it on the fold, and the third and smallest one placed rather more posteriorly nearly midway between the other two, I believe I can trace these dots more or less distinctly in all my specimens of *insecurellus*, whereas in the bred specimens of *iniquellus* I see no symptoms of them.

Herrich-Schäffer's figure of *Ch. dentosellus* shows no indication of these three black dots; moreover, he says it occurs near Vienna in May and June, a period of appearance which would ill accord with *insecurellus*, so that on these two accounts I would prefer for the present to consider *dentosellus* as distinct from *insecurellus*.

The larva of *iniquellus* being a seed-feeder must be much less exposed to observation than the leaf-feeding larvæ of this genus. In localities where *Heracleum sphondylium* grows commonly by the road sides, and *Chauliodus chærophyllellus* occurs, the presence of the larvæ of this species as revealed by the browned leaves of the *Heracleum* becomes quite a feature in the landscape.

As the larva of *insecurellus* has hitherto escaped observation, I strongly suspect that it must be a seed-feeder, and very probably, as with *iniquellus*, the larvæ which feed up and pupate in autumn do not appear in the perfect state till the end of July and beginning of August.

In Dr. Rössler's last work on the *Lepidoptera* (Die Schuppenflügler) of Wiesbaden he has a notice of *Chauliodus iniquellus*, at p. 318, which is very suggestive. "The imago is not scarce in woods near Mombach, in July, on and around the flowers of *Peucedanum oreoselinum*. If we wish to breed it, all we have to do is to carry home the umbels of ripe seed in October. Afterwards we shall find amongst them on the ground numerous small pupæ without any cocoons. Any traces of the larvæ in the seeds or stems have not been observed."

I must here repeat my best thanks to Monsieur Constant for his most acceptable present of pupæ of *Chauliodus iniquellus*, the new notions thus obtained seem now to have brought us within measurable distance of the discovery of the larva of *Chauliodus insecurellus*.

I shall be very glad to hear from any Entomologist who has made any recent captures of the insect. Its old locality must I fear have long since been extirpated by advancing cultivation, if not by bricks and mortar, but no doubt it occurs on other chalk downs, where shelter for unfortunate *Micros* is afforded by the growth of juniper, and where *Umbelliferæ* of some sort blossom and go to seed.

Mountsfield, Lewisham, S.E. :

August 14th, 1882.

DESCRIPTION OF A NEW SPECIES OF *PENTATOMIDÆ* FROM JAPAN.

BY W. L. DISTANT.

In writing on a small collection of *Rhynchota* from Tokei, Japan (Ann. & Mag. Nat. Hist. [July], 1881, p. 28), I recorded a species of *Pentatomidæ* as *Tropicoris metallifer*, Motsch. ?, remarking that my two Japanese specimens appeared to agree well with the descriptions of Motschulsky and Oschanin (the latter author having renamed and re-described the species), with the exception of the colour of the apex of the scutellum ; I have, however, recently received a specimen of *T. metallifer* from the Amur, and find that the Japanese forms constitute a very distinct species, which I here describe.

TROPICORIS JAPONICUS, *n. sp.*

Body above metallic-green, body beneath and legs pale reddish, membrane pale fuscous, with the nervures darker. Head very thickly and coarsely punctate, with the eyes ochraceous. Antennæ, with the 1st and 4th joints, pale reddish ; 2nd, 3rd and base of 4th joints fuscous ; 3rd joint longest, 1st smallest, 4th a little longer than 2nd (5th wanting). Pronotum coarsely and densely punctate, sub-rugulose at base, lateral angles produced into somewhat broad and flat processes, their apices slightly concave, the apical angles obtusely spinous, the anterior spine longest and most produced, lateral angles distinctly serrate, and, with the margins of posterior angles, pale reddish ; two small, irregularly rounded, ochraceous fasciæ near anterior margin. Scutellum thickly and coarsely punctate, and sub-rugulose at base. Corium very thickly and finely punctate. Abdomen above dull reddish. Membrane pale fuscous-hyaline, appearing darker at base, from reflection of abdomen, the nervures darker. Abdomen beneath bright pale reddish, the sternum somewhat ochraceous. Prosternum coarsely punctate, particularly at lateral angles. Legs speckled with fuscous. Stigmata black. Rostrum ochraceous, its apex pithy and reaching the base of 4th abdominal segment.

Long. 17 mm. ; lat. pronot. angl. 11 mm.

Hab. Tokei, Japan.

This species is closely allied to *T. metallifer*, Motsch., but differs by the very different structure of the pronotal angles, the concolorous apex of the scutellum, different colour and structure of the antennæ, &c.

Selston Villas, Derwent Grove, East Dulwich :

August, 1882.

✓C

NATURAL HISTORY OF *ENNYCHIA ANGUINALIS*.

BY WILLIAM BUCKLER.

In the belief that no description has been heretofore published of the larva of *E. anguinalis*, I am induced to think the following account of it from the egg may be acceptable, and here I must thankfully acknowledge that it is entirely due to the kind and friendly co-operation of Mr. W. R. Jeffrey in sending me the largest share of a small batch of eggs he was lucky to obtain from the parent moth he had captured, that I am enabled to give this history.

I received the eggs on the 9th of August, 1881; eleven of them were laid on leaves and on a bract of the blossom of *Origanum vulgare*, and four on a leaf of *Mentha arvensis*, singly, and one overlapping another; though they were very flat when first laid, as Mr. Jeffrey informed me, yet I found they had begun to swell and by the next day had filled out considerably, and on the 17th four of them hatched, and another on the 20th, but no more.

The larvæ moulted three times, the first moult occurring when they were eleven days old, the second moult when twenty-five days old, and the third moult at the age of thirty-eight days; from this last moult the period of maturing varied from thirteen to seventeen days; the latest hatched individual was full-fed on 17th of October, just six days behind the others.

At Mr. Jeffrey's suggestion I tried *Thymus serpyllum* at first with two larvæ, and they took to this food very well as long as the supply lasted, the others equally well to *Origanum*, feeding on the cuticle of the leaves during the first three days and thus caused small transparent blotches, and on the fourth day began to eat small holes quite through the substance of either leaf.

About the end of the month I found only four alive, as one of those two that had previously fed on thyme—a food I was unable to provide any longer—had died, having refused the marjoram, although its companion soon took to it, and the others had thriven well on it from the very beginning of their career to the end; eating more and larger pieces from the leaves as they grew bigger, and latterly whole leaves would be consumed, but only those of a medium size, for they seemed not to care for the larger leaves nor the smallest, nor the blossoms.

They very cleverly kept themselves concealed by spinning their light hammocks in such an artful manner as to draw a leaf or two partly round the stem of their location so as to appear like a natural disposition of ulant growth; and so fine and thin was the silk

spun under the leaves, that though of whitish colour it never showed at all conspicuous, while it served to veil the full depth of the larval colouring; indeed, the whereabouts of a larva could only be guessed, by noticing pieces absent from the neighbouring leaves, as it was very seldom I could detect one while it was stretched out a little beyond its residence in the act of feeding.

When full-fed they wandered restlessly for two or three days, and then one spun itself up in a cocoon attached to the top of its cage and to the lino cover, another spun its cocoon in a piece of hollow stem provided for it, one in the leaves of marjoram, and the fourth I accidentally squeezed, so that it was unable to spin and eventually perished; and I learned from Mr. Jeffrey that a similar untoward mishap had befallen one of his only two larvæ just when he had brought them to maturity.

From the larvæ reared between us, three examples of the moth were bred, the earliest by Mr. Jeffrey on 8th of last June, and two by myself, probably somewhat later, as they had both died before I had observed them.

The egg of *anguinalis* is round and flattened, becoming more and more convex and plump above as the embryo develops; the surface is very finely pitted or reticulated, of a whity-greenish tint and slightly glistening; the day before hatching the darkish head of the embryo shows through the shell.

The newly-hatched larva is of a transparent flesh-colour, slightly tinged with pinkish-grey, with a grey-brown head and neck plate, and on the rest of the body most minute dusky dots and hairs; it becomes pinkish when a week old, and very active.

After the first moult it is semi-transparent tinged with dark purplish-pink, which increases towards the end of this stage, and its hammock is very transparent.

After the second moult the larva is of a deep purplish brown-pink colour, the skin less transparent than before, except the plate on the second segment, which is translucent, glossy and greenish, finely freckled with black, the head similar but with browner freckles on the face; the spots on the body are very distinct, large, black, and glistening, while the purplish-brown skin is dull and opaque; ten days later, when seen in repose it seems short and almost black, though when disturbed and eager to escape it stretches itself out to $8\frac{1}{2}$ mm., and is then seen to be much more slender, and tapered at either end; the colouring of the head and second segment is as before a rather olive-green, but the skin on other parts appears to be a very dark smoky-green, and slightly glistening at the segmental divisions.

D.J.

In about ten or eleven days after the third moult its full growth is attained, and the length is 18 mm., its stoutness in proportion, tapering from the third segment to the head, also at the two hinder segments; beyond the thoracic each segment is subdivided by a deep wrinkle across the middle of the back and again by one nearer the front and another nearer the end, the two central portions, bearing the trapezoidal large roundish spots, are very plump, a similar spot is on the side, another beneath the spiracle and another is lower and farther behind, near the belly; the colour of the head and second segment is bright olive-green and very shining, the lobes of the head are marked on the crown with black and with fine black freckles on the face, the plate is also finely freckled with black, all the rest of the body has a very dull purple skin relieved by large black and minutely wrinkled spots, especially while the larva lies at rest, but when roused up into activity the purple hue still becomes a little neutralized by the green interior, this change of colour seems to be caused by extreme tenuity of the skin at such times, when it allows the green to show partly through, and to glisten slightly at the divisions and increase the soft lustre of the black spots; when, however, the larva shortens itself and the skin shrinks, it obscures the green beneath, much as the skin of a purple grape obscures the green pulp within; each spot bears a fine hair; the spiracles are small, round and black; the anterior legs green, the ventral and anal legs are translucent and almost colourless.

The cocoon is of whitish silk, which, after a few weeks, turns of a light flesh-colour, its shape is oval, about 11 mm. long, and composed of a coarser outer structure and a more compact and finer texture within.

The empty pupa-skin was found to have nothing remarkable in its form but a rounded knob at the abdominal tip furnished with widely diverging, fine, curly-topped bristles attached to the lining, its length being 7 mm.; in colour darkish brown and rather shining.

Emsworth: *August 10th*, 1882.

A CONTRIBUTION TO THE LIFE HISTORY OF *SPERCHEUS* *EMARGINATUS*.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

About the 16th of last May, Mr. Billups kindly sent me two live specimens of *Spercheus emarginatus* taken at West Ham. I put them into a glass globe of water to watch their habits: the first thing that struck me was the peculiar way in which they walked on the under-

side of the surface of the water, exactly like a fly on the under-side of a pane of glass; a thin film of air contained between the abdomen and the projecting sides of the elytra seemed to serve as a kind of float, and support them.

On May 19th, I was very pleased to see that one of the specimens had developed an egg-bag: the bag is formed of a tough whitish membrane, and covers the whole of the abdomen: at first it was contained within the projecting sides of the elytra, but by May 25th, it had swollen beyond them: on May 28th, it was very much swollen, and the shape of the eggs (a long oval) was quite visible; unfortunately, I did not look at the beetle again for two or three days, as I was much occupied, and, therefore, missed the hatching period, but on May 31st, I found that the egg-bag had disappeared, and that a number of larvæ (about 100) were hatched out. I at once noted that, although so entirely different in shape, they walked on the under-side of the surface of the water back downwards, exactly like their parents: occasionally, they would crawl below upon the plants, but did not stay for long, and immediately on letting go their hold of the plant, they rose rapidly to the surface: apparently, it is impossible either for the larvæ or perfect insects to go beneath the surface of the water unless they can manage to cling to some plant and crawl down; on examination of some specimens of the larvæ mounted in glycerine jelly, I found the tracheæ very largely developed, and the quantity of air thus contained within the body would explain the fact; the tracheæ end at the tail, through which the insect apparently mainly breathes: it never, however, assumes a perpendicular position like the larva of the gnat, but always keeps a horizontal one, with all its legs at the surface, and its tail curved upwards to meet the air.

I hoped to follow the insects through further stages, and divided them into three lots, but, by June 5th, all the first lot had died, and, by June 9th, the second lot, all but one or two, had died also; on June 10th, I found out the reason, for I caught them in the act of devouring one another, an operation for which their huge jaws peculiarly fitted them. I then separated the very few remaining out of the three lots, but it was of no use, as the last died on June 12th. The original beetles are now (Aug. 9th) well and thriving, and will, I hope, continue so, as Mr. Billups tells me that a railroad is likely to be run through the locality they came from, and that *Spercheus* is likely again to become in time one of our greatest rarities.

The larva is so peculiar, especially as regards its mouth parts, that I got Mr. Matthews to dissect it, which he has done with his usual

skill, and has also furnished me with his drawings, and the chief part of the appended description: so little is known of the larvæ of the various species of *Coleoptera*, in spite of their characters being so important for classification, that the addition of even one or two full descriptions may prove of great use.

The following, then, is a detailed description:—

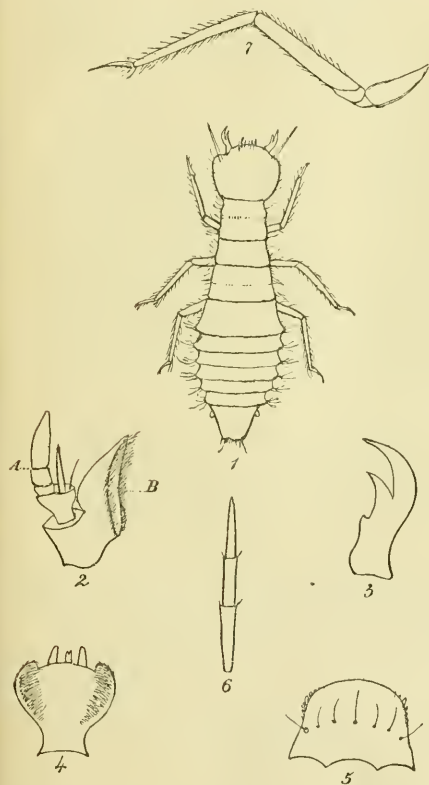
Head very large, rounded, with short, straight, filiform antennæ, consisting of three almost equal joints (fig. 6). *Body* elongate, rather narrowed anteriorly, considerably widened behind middle, conical towards the extremity, with two prothoracic segments divided by a very indistinct suture, three metathoracic segments divided

by two equally indistinct sutures, and seven abdominal segments, of which the first is considerably the largest. The last segment of the abdomen carries two small knobbed processes, and each joint is furnished with strong setæ.

Legs rather long and slender, with the trochanter of the hind-leg divided transversely in two parts (fig. 7); *tibiæ* narrowed towards apex, widened at the base, with a few long setæ on each side: *tarsi* one-jointed, carrying two claws of unequal length.

The mouth parts are very peculiar (especially the maxillary palpi, which are almost unique in shape), and, therefore, deserve a separate description:—

The *maxillary palpi* (fig. 2A) are four-jointed, and have the basal joint very enlarged, with a hollow cavity on the inner-side covered with a membrane, from which a long point or style proceeds, like another lobe; the second joint is very short, the third double the



length of the second, and the fourth as long as the other two together.

The *maxilla* (fig. 2B) is unilobed, sharply pointed, with a flat surface in the middle, fringed with hairs on either side. The mandibles (fig. 3) are very large and slender, each with the apex divided into two very strong and very sharp hooked teeth, the upper being the longest; there is also a blunt tooth about half way between these and the base of the mandible.

The *mentum* (fig. 4) is balloon-shaped, broadly rounded in front, and constricted at base, with a strong fringe of incurved hair on each side within the outer edge:

the apical edge is broadly excised; it seems to bear a considerable resemblance to the so-called mask of the dragon-fly; the *labium* and *ligula* are concealed behind the mentum, and only the points of the labial palpi and ligula are visible.

The *labrum* (fig. 5) is very large, rounded, and convex, with a few small teeth on each side, and a row of fine setæ about half way from the base.

The insect always carries its formidable mandibles wide open, and is evidently carnivorous.

Lincoln: August 10th, 1882.

NOTES ON THE NEUROPTERA OF LANGDALE.

BY J. J. KING.

On August 3rd, 1881, I left London for a holiday at the English lakes, having selected Skelwith Bridge, which is about three miles from Ambleside, as my head quarters.

During the month of my sojourn I found the English lake district to have rather a depressing effect on the spirits of the anxious collector who is eager to be at his work, owing, in a great measure, to the abundant supply of rain, which at times continues without intermission for four days (my experience), and causes the river to rise many feet above its usual level, covering up the bushes and herbage along its banks, so that all collecting along the margins of the river has to be suspended for a few days, until the ground gets into a fit state to walk upon.

In a moderately dry season I should think that the district would turn out well for *Neuroptera*, as there is a very great variety of land surface, &c., but my captures were not very extensive, owing to the wet season.

On the afternoon following my arrival, I went down to Windermere lake to search for *Setodes argentipunctella*, McL., the type specimens of which had been taken by Mr. Hodgkinson, near Windermere lake, but I was unsuccessful in obtaining it near the lake; Mr. McLachlan having shewn me a number of specimens of this species that he had captured in Belgium, during July, along the banks of a small river, I thought I might obtain it if I made a search along the Brathay river, and towards evening I was rewarded with a number of this beautiful little creature, which abounds near Brathay Church.

I only captured some 84 species, excluding the *Perlidae* and *Ephemeridae* (which are not worked up yet), most of them being more or less common; but among the *Trichoptera* one novelty fell to my net, namely, a new *Hydroptila*.

Below will be found a list of the species taken.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Clothilla pulsatoria, L., very common in the house.

Psocus longicornis, Fab., a few were taken along the Brathay river, and also near Rydal water. *Ps. nebulosus*, Ste., common everywhere. *Ps. variegatus*, Fab., rare, near Dungeon Ghyll. *Ps. sexpunctatus*, frequent on the road to Dungeon Ghyll. *Ps. bifasciatus*, Latr., common near Grasmere lake and Brathay river.

Stenopsocus immaculatus, Ste., abundant everywhere.

Cæcilius flavidus, Ste., common all over Langdale. *C. obsoletus*, Ste., rare in Langdale. *C. vittatus*, Dahm., frequent.

Peripsocus phæopterus, Ste., frequent.

Elipsocus Westwoodii, McL., abundant everywhere. *E. hyalinus*, Ste., equally common with the last. *E. flaviceps*, Ste., common.

ODONATA.

Sympetrum striolatum, Charp., common. *S. scoticum*, Don., rare.

Libellula quadrimaculata, L., a few specimens were observed sporting over some pools on Loughrigg Fell.

Cordulegaster annulatus, Latr., not common.

Æschna juncea, L., frequent. *Æ. cyanea*, Müll., with the last species.

Pyrrhosoma minium, Harr., on every pool.

Agrion cyathigerum, Charp., about Grasmere lake and Rydal water.

NEUROPTERA-PLANIPENNIA.

Sialis lutaria, Linn., a few. *S. fuliginosa*, Pict., not common.

Sisyra fuscata, Fab., abundant about Grasmere and Rydal water.

Micromus paganus, L., common everywhere.

Hemerobius micans, Oliv., common. *H. humuli*, L., abundant. *H. marginatus*, Ste., a few specimens along the Brathay river. *H. limbatus*, Wesm., frequent. *H. subnebulosus*, Ste., on trunks of apple trees near Skelwith Bridge.

Chrysopa flava, Scop., common. *Ch. alba*, L., common everywhere.

Coniopteryx tineiformis, Curt., and *C. aleyrodiformis*, Ste., both species were to be had by beating.

Panorpa germanica, L., common.

TRICHOPTERA.

Phryganea varia, Fab., common near Elter water.

Limnophilus marmoratus, Curt., common all over the district. *L. lunatus*, Curt., common everywhere; on the south side of Rydal water it is excessively abundant, each tap of the beating stick dislodging scores of this species: I caught some hundreds of it to see if I could get variety in wing-markings, but did not find a specimen that differed much from the type. *L. centralis*, Curt., also very common. *L. sparsus*, Curt., abundant.

Anabolia nervosa, Curt., not common.

Stenophylax stellatus, Curt., abundant.

Haesalus radiatus, Curt., a few were taken on the Brathay river.

Drusus annulatus, Ste., rare.

Sericostoma personatum, Spence, a few specimens occurred.

Goëra pilosa, Fab., at Elter water, but rarely.

Silo pallipes, Fab., common.

Crunecia irrorata, Curt., three specimens were taken.

Lepidostoma hirtum, Fab., common everywhere.

Leptocerus alboguttatus, Hagen, very common near Skelwith Bridge. *L. cinereus*, Curt., not so common as the next. *L. aterimus*, Ste., abundant. *L. bilineatus*, L., at Elter water. *L. albifrons*, L., among the rushes on Elter water. *L. dissimilis*, Steph., not common.

Mystacides nigra, L., not common. *M. azurea*, L., common. *M. longicornis*, L., also common; a nice yellow variety of this species occurred, in which the dark markings are nearly obliterated.

Trienodes bicolor, Curt., common, by sweeping the reeds on Elter water.

Æcetis lacustris, Pict., common at Elter water. *Æ. testacea*, Curt., with the last. *Æ. furva*, Ramb., rare at Elter water.

Selodes argentipunctella, McL., common along the Brathay river.

Hydropsyche lepida, Piet., a few were taken along the Brathay river. *H. guttata*, Pict., common everywhere.

Philopotamus montanus, Don., rare on the Brathay river.

Wormaldia subnigra, McL., rare in the same locality as the last.

Neureclipsis bimaculata, L., two specimens.

Polycentropus flavomaculatus, Pict., common. *P. Kingi*, McL., rare.

Holocentropus picicornis, Steph., frequent.

Cyrnus trimaculatus, Curt., common everywhere. *C. flavidus*, McL., rare on Elter water.

Tinodes wæneri, L., common on all the streams.

Psychomyia pusilla, Fab., a perfect pest.

Chimarra marginata, L., a few on stones on the bed of the Brathay river.

Rhyacophila dorsalis, Curt., always turning up when it was not wanted.

Glossosoma vernale, Pict., common.

Agapetus fuscipes, Curt., common.

Ithytrichia lamellaris, Eaton, along the Brathay burn.

Hydroptila, n. sp. I believe that this species was taken among the rushes on Elter water.

Oxyethria costalis, Curt., and *Orthotrichia angustella*, McL., both occurred along the Brathay burn.

207, Sauchiehall Street, Glasgow:

June, 1882.

ON THE SPECIFIC IDENTITY OF *TERIAS HECABE* AND *T. MANDARINA*.

BY H. PRYER, C.M.Z.S.

For the second time I have bred the full black bordered *Terias Hecabe* from eggs laid by the extreme form of *T. Mandarinina*; the latter is simply the form under which this species hibernates.

Some five years ago I succeeded in breeding a few specimens, all of which were good typical *Hecabe*, from eggs laid in the early spring by *Mandarinina*, but hesitated in publishing the fact until I had confirmed it by further observations.

T. Mandarinina only appears about Yokohama in the autumn and after hibernation in the spring, the intervening broods being *Hecabe*.

A decided difference is observable in specimens according to the altitude at which captures are made, the *Mandarinina* form appearing much sooner towards autumn in the mountains than on the plains. We may, therefore, conclude that temperature is the cause of the differences in form, size, and coloration of this extremely variable insect. This insect having been described under many names, I propose uniting all under the name of *Terias multifrons*, and in a paper in course of preparation will give a list of its synonyms.

Yokohama: 3rd June, 1882.

HYMENOPTERA AND HEMIPTERA AT DEAL IN JULY AND AUGUST, 1882.

BY EDWARD SAUNDERS, F.L.S.

I have just returned from Deal, where I have been staying for about three weeks, during which time I have done my best to get together as many rarities as possible. The late Mr. F. Smith always regarded Deal as one of the best localities for *Hymenoptera* in this country, and, knowing the many scarce species that he took there, I was very glad to have an opportunity of collecting on the same ground. I think I may say that I found the larger proportion of the species that he mentions as occurring there, but two or three which he found in abundance were totally absent, so far as I was able to discover. The year in which Mr. Smith found his best things was 1857, and he gives a full account of his captures in the Entomologists' Annual for 1858. No doubt that year, as he says, was unusually hot and sunny, and this year has been thus far less sunny than usual; still, I did not have a single wet day whilst I was at Deal, and I was certainly surprised at the absence of some species and the scarcity of others which

one expected to find in abundance. I may take the following as examples of divergence in the experiences of Mr. Smith in July and August, 1857, and myself in July and August, 1882.

HYMENOPTERA.

Andrena Hattorfiana. Smith says: "The fine red variety, and also the black, in about equal numbers; in all, thirty fine specimens of the female, the male we were too late for. All were taken on the flowers of *Scabiosa arvensis*." This year the black variety of the ♀ was common, but I could not get a single coloured one; I got the ♂ also, but not so commonly, and only when first I arrived, about the 20th of July: at that time both sexes frequented the flowers of *Centaurea scabiosa*, but, later on, when *Scabiosa arvensis* was in full bloom, although the *Centaurea* was still out, they appeared to visit *S. arvensis* almost exclusively.

Andrena Cetii.—"This pretty little species was plentiful on the scabious; we found every variety, including the '*affinis*,' of Kirby—the male varieties include the *A. frontalis* of Smith" (Smith). Of this insect I could not find a single specimen. The weather was fine, the scabious abundant, and the time of year and locality the same as when Smith was collecting, but no *Cetii* could I find.

Andrena simillima.—"Extremely abundant on the flowers of the blackberry; this species was taken at the foot of the cliffs, half a mile beyond Kingsdown" (Smith). This species also I could not find, but I expect I did not go far enough along the coast for it.

Andrena coitana.—"Very plentiful" (Smith). I did not meet with it.

Nomada jacobææ "in some numbers" (Smith). I did not meet with it.

Epcolus variegatus.—"Taken plentifully" (Smith). I found it, but very rarely.

Cilissa leporina "on the slope of Kingsdown it abounded" (Smith). I only found one worn ♂.

If there were any doubt as to the locality or the time of year the absence of these species might be explained, but Mr. Smith, in his article in the Annual, says: "During the latter part of July and the beginning of August," and describes the locality at Kingsdown so exactly, that it could not be mistaken; the only difference in the place seems to be that in 1857 the ground above the slope at the side of the road between Walmer and Kingsdown was waste, and now it is cultivated, but the slope itself remains in its natural state. I also took the following, which I think are worthy of notice:—

Pompilus chalybeatus, ♀, and *Wesmaeli*, ♂ ♀, on the sandhills. The latter species, with the curious spine in the middle of the ventral valve of the apical segment of the abdomen of the ♂, has only occurred in this country before at Chobham.

Miscophus maritimus, 2 ♂ and several ♀ on the sandhills.

Tachytes lativalvis, Thoms.?, ♂. I have taken 3 ♂ of a *Tachytes* with the pubescence of the face bright golden. This peculiarity Thomson gives as a characteristic of his *lativalvis*, but I only got the one sex, and do not yet feel quite certain that it may not prove to be a variety of *pectinipes*.

Prosopis dilatata, both sexes common on *Achillea millefolium*.

Colletes marginata, a few ♂, by sweeping, and several ♀ off the flowers of *Trifolium arvense*, *repens*, and *agrarium*, on the sandhills, but difficult to see, as it frequents such very low growing plants.

Cælixys acuminata, 4 ♀ from a small sandy pit near Kingsdown.

HEMIPTERA.

In this Order I did not capture many rarities, as my time was almost exclusively devoted to the *Hymenoptera*; Mr. E. P. Collett spent one day with me, and worked more particularly for them, and, from the result of his day's work, I should think that this year was not below the average for the *Heteroptera*. Amongst my better captures were:

Odontoscelis fuliginosus, on the sandhills.

Calyptonotus lynceus, on the sandhills, but chiefly in the larval form. I only got 2 perfect and Mr. Collett 1.

Teratocoris Saundersi, in the same locality where I took it in 1868, and apparently confined, as then, to one spot, *i. e.*, the small rushy tract just when first one enters the open ground beyond Sandown Castle, which is strewn with large stones. I took ♂ and ♀, only 2 of the latter fully developed.

Miridius quadringatus, 2 specimens by sweeping.

Plagiognathus Bohemani, and *nigritulus*, the former commonly, the latter rarely, on the dwarf shallows, by sweeping and by grubbing at their roots.

Globiceps salicicola, Reut. ? (Ent. Mo. Mag., xvii, p. 13), rarely, on the dwarf shallows, by searching among the stems and at the roots. I could not get it by sweeping. I must express my great doubt as to the distinctness of this species from *flavomaculatus*. Reuter lays stress on the shape of the basal spot of the corium, but in the specimens I have (8 males and 12 females), the shape of this spot varies in both sexes from a basal triangle to a lateral vitta, extending to the apex of the

corium, and triangularly widened at the base; also the carina at the back of the vertex is distinctly curved as in *flavomaculatus*. Is it possible that *flavomaculatus* also lives on the sallow, or is *salicicola* a northern form, perhaps, of *flavomaculatus*? I will send examples to Dr. Reuter, and obtain his views on them.

Nabis flavomarginatus, 1 developed ♀, by sweeping.

Holmesdale, Upper Tooting:

14th August, 1882.

Cocci and earwigs.—I have on my red currant bushes some colonies of *Lecanium ribis*, A. Fitch, which year after year increase and multiply, that is, in some years there are more absolutely than in others, and in one year they abound on one bush, and in one year all but leave it and appear on another. I speak only of the females, for the male I have never been able to find in any stage of life. The species seems distinct enough, the shell being separable by its characteristic structure from that of others of the genus resembling it, and it seems to be confined to the red currant, except that I have found occasionally, on an adjacent *Acacia*, one or two which I believe to be of the same species, but they do not occur on any other tree. Their manner of life is in this wise: in the early spring (February or March) the eggs are hatched under the hibernated maternal shell, which was in the year previous fixed on the older branches, generally under the protection of loose bark, and although the young ones soon come out from the cover, they remain close by, and for many weeks grow very slowly, remaining soft, shell-less, and of a dingy light brown colour. About the middle of May the shell becomes well defined on the growing or full-grown form, assuming a light brown colour, and having several dark brown streaks or shades, the shape being broad-oval, slightly convex. Then they gradually become more convex, the discoidal wrinkles appear, the smooth central ridge more distinct, and the colour changes to deep, shining, sealing-wax red, which is maintained throughout the following winter.

Up to the 15th of June this year the shells, growing and even full-grown to the limit of the penultimate condition above mentioned, were numerous, but then almost all disappeared, and I was puzzled to account for their absence. But, looking closely one day at the end of June, I saw, at the place where a *Lecanium* had been a few days before, two young earwigs engaged in demolishing the last remains of the departed. It is perhaps hazardous to say in this case "*ex uno disce omnes*," but I think it not at all improbable that among their capabilities the *Forficulae* are cocci-vorous. If this theory be correct, then earwigs may be added to the list of beneficial insects recommended by Mr. Comstock as desirable to encourage in districts infested with injurious *Coccidæ*.

In his description of *L. ribis*, Asa Fitch has stated that, in the State of New York, it is common on the red currant, and that he supposes it was imported with plants of this fruit from Europe, which may possibly be true, although it is added, no European author has indicated any *Lecanium* living on currant bushes. (Signoret, Ess. Coch. p. 462). As far as he was able to judge from some ♀ examples which I sent to him, and without knowing the ♂, Dr. Signoret believed this species to be distinct from any other described one.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: August 10th, 1882.

Eupteryx vittatus.—In confirmation of the note in the August No. (p. 67, *ante*), I may mention that on a large patch of ground-ivy, in a wood not far from here, I found, this morning, *Eupteryx vittatus* in the stages of larva, pupa and imago, the latter in some numbers.—E. A. BUTLER, Hurst Green, near Hawkhurst: August 7th, 1882.

Leptidia brevipennis, Muls., found in England.—Some little time ago, I received a Longicorn, very like a *Molorchus*, from Mr. Chappell, of Manchester, who said that Mr. Reston, of Stretford, had taken it in some numbers; it was, however, very different from any other British Longicorn when examined closely, so I sent it to M. Fauvel, who named it as *Leptidia brevipennis*, Muls., an insect that seems to be peculiarly French. I therefore wrote to Mr. Reston, asking him for any particulars as to its capture, and he replied as follows: "During the July of 1880, one of my servants brought me two specimens taken in the garden at the back of the house (the only two specimens then noticed). Last July, however (1881), two or three more were captured, and a day or two after they called my attention to the fact that numbers (dozens in fact) were creeping upon the floor in the scullery; upon examination, I traced them to an old basket used for potatoes, and generally kept under the slopstone, and consequently moderately damp; in this they show their presence by numerous small round holes about the size of a pin's head." After I wrote to him upon the subject, Mr. Reston submitted this basket to a professional basket maker, who pronounced it to be evidently "of French make from Dutch willows." I think that this history well deserves recording, as there can be no doubt that several of our Longicorns, and many other *Coleoptera* besides, have a still more slender claim than the beetle above mentioned to be considered indigenous. Had the captures outside the house alone been noticed, and had Mr. Reston not so thoroughly investigated the matter, the insect might very probably have found its way into the British list, especially as it is an insect that might very well be found in Britain, and is very likely at some period or other to become naturalized.—W. W. FOWLER, Lincoln: August 9th, 1882.

Stridulation in the female of Parnassius Apollo.—In the evening of the 23rd of July, while reclining on the grass near Bannio (Val Anzasca), a rustling as of lizard or snake close to the back of my head made it desirable to look round to see what was going on there. An apparently drowsy *P. Apollo* hanging on by her fore-feet to a composite flower, deprecating the menacing brim of my hat, was slowly flapping her wings, and scraping the hinder pair with her four posterior legs, which were thrust backwards simultaneously each time that the wings opened. Obstruction to the movement of the fore-wings caused no hindrance to the production of the sound; but when the hind-wings also were held firmly between the finger and thumb, the noise ceased. The insect became so wide awake at this stage of the proceedings, that no further observations could be made; but it seemed probable that friction of the spines of the tibiæ and tarsi over the wing-veins largely contributed to the vibration of the wing membrane.—A. E. EATON, Chepstow Road, Croydon: 18th August, 1882.

Acronycta alni near Bristol.—While collecting in Leigh Woods to-day with

Captain Shelley, I was much pleased at taking a full-fed larva of *A. alni* from sweet chestnut. The larva was at rest on the upper-side of a leaf, and, with the sun shining on it, presented a beautiful and conspicuous object.—W. K. MAXX, Clifton, Bristol: *August 17th*, 1882.

Variation in Zygæna filipendulæ.—I have made further enquiry respecting the varieties of *Zygæna filipendulæ*, mentioned in the June No. of this Magazine, of the Rev. C. Wilkinson, by whom they were reared. He has collected all over his parish—Castlemartin—for the last ten years, and fully agrees with me that *Z. trifolii* is not to be found within some miles of the locality in which he collected these larvæ. Therefore, hybridism can have nothing to do with the present case of variation. (I may add that, as a matter of private opinion, that I have no belief whatever in the—supposed—effect of hybridism in producing varieties. I am quite aware that where insects swarm cases of abnormal union are occasionally observed, but all the experience to which I have any access is opposed to the belief that perfect insects, in any but the rarest cases, result from these unions).

As suggested by Mr. Briggs (*ante*, p. 43), the specimen without the sixth spot is a ♀, and the spot is only very faintly indicated beneath; the other specimen—with indistinct sixth spot—is a ♂, and the spot is distinct beneath.—CHAS. G. BARRETT, Pembroke: *12th July*, 1882.

Destruction of Lepidoptera by rain.—A very short time ago I had occasion to remark incidentally on the destruction to larvæ caused by heavy rain. An instance of its effect on the perfect insects has just pressed itself most strongly and unpleasantly upon me; I suppose that when much ice is reported in the North Atlantic, these islands generally are sure to be visited with abundant and heavy storms of rain, but this west coast most decidedly bears the heaviest brunt of them. This has been the case lately, the rain has come down in such torrents that insect life could barely endure it. After a series of these storms, the 29th of last month proved a lovely day, and I seized the opportunity of passing through Canastar Wood to look for a few of the ordinary wood-flying *Geometræ*, which were wanted for a local museum. The result was nil. As far as I could judge, every *Geometra* was destroyed except a few that had just emerged. Even *Melanippe montanata* had disappeared from the wood, though still common in the sheltered lanes. There were a few *Campptogramma bilineata*, but only a few, and they were quite fine; two *Cidaria populata* also turned up, equally fine; and I found one really interesting species—*Eupithecia debiliata*, two specimens, just out; the first flew from among *Vaccinium*, but I obtained the second by following Mr. Birchall's advice of long ago, "beat holly hard." This is a new locality for this very local species.—ID.

Odour emitted by the male of Hepialus hectus.—When at Canastar Wood, as already mentioned, I found at early dusk *Hepialus hectus*, evidently just emerged, and in most perfect condition, flying in plenty. As it is extremely local in this country, and as I wanted series for the museum, and one or two other collections, I secured as many as I could during the few minutes of its flight—some forty males and four females. To the fortunate circumstance of taking so large a number

perfectly fresh, I attribute the discovery of a fact which I have not seen recorded—that this species, when in fine condition, diffuses a very decided perfume, almost exactly the same as the perfume given off by the larva of *Papilio Machaon*, when its curious forked tubercle is extruded, and more like that of ripe pine-apple than any other perfume that I know of. I noticed it faintly when turning the moths out of the pill-boxes, but when a number were pinned into a box it became very noticeable indeed. It was confined to the male moths, and seemed especially to come from the curious bladdery termination of the aborted hinder legs, but of this I am not positive. It certainly does not continue to be observable when the moths get worn. I suspect that it has some connection with the curiously inverted habits of the sexes in *Hepialus*, and seems to attract the females.—ID.

Captures of Lepidoptera in Yorkshire.—On Saturday last, August 5th, I found a larva of *Acronycta alni* on the upper-side of an oak leaf, in Edlington Wood, near Doncaster. Imagos of *Thecla w-album* were plentiful in the same wood, but worn, and evidently nearly over. On the bank-holiday, Monday, August 7th, the Yorkshire Naturalists' Union made an excursion to Grassington, in Upper Wharfedale. *Erebia Blandina* was flying in great abundance on all the grassy slopes in the Grass Wood, and I could, in such places, net as fast as box them. Hundreds must have been secured by different collectors, and hundreds more might as easily have been taken. Mr. E. P. P. Butterfield, of Bingley, took, on the same ground, a specimen of *Miana exposita*, a species quite new to the county of Yorkshire. But although some few interesting species have occurred, it is, I think, thus far in Yorkshire, the worst season for *Lepidoptera* I ever experienced.—GEO. T. PORRITT, Huddersfield: August 8th, 1882.

Scoparia conspiciualis, Hodg., near Doncaster.—This morning I received several specimens of this species from Mr. Prest, of York. Previously I did not know the insect, but on opening the box saw directly that it was perfectly familiar to me, and, on looking over my store boxes, I at once picked out seven nice specimens. I took them certainly two, and probably three, years ago in Edlington Wood, near Doncaster, and am pretty sure I have seen the species on the same ground each season since, but have always passed it over as a form of *ambigualis*. Probably, when its distinctive characters are well known, it will prove to be common enough.—ID.: August 17th, 1882.

Laverna atra.—Between 7 and 8 o'clock on the evening of the 16th inst. my attention was arrested by a swarm of 20 or 30 small black moths performing an ecstatic dance over a gooseberry-bush growing under the spreading branches of an apple tree, each individual settling repeatedly for an instant on one of the terminal leaves of a branch, and then darting off again. This temporary insanity lasted only about five minutes, and then all was still. I soon came to the conclusion that this was a *levée* of lords in waiting, thus showing their devotion to an attractive queen hidden in the recesses of the leafy bower, or, in the more prosaic phraseology of the old Aurelians, they were male moths engaged in a "sembling match." During the fit I managed to capture six of the Lotharios, and found, afterwards, they were all

males of the black form of the *Laverna atra* of our lists, not one of them, nor indeed of any that I had seen, having any of the light colour on the inner margin of the fore-wings, indicating what we specially know as *L. atra*, the dark form being reputed to be a variety of it.

The larva of the light-marked form is said to feed on hawthorn-berries, in September, that of the black one in budding shoots of apple in February and March (Stainton's Manual, ii, p. 399). In the spring I have seen such larvæ in the spurs of apple trees on which the blossoms normally grow, but which, by the action of the larvæ, are aborted. The autumnal larvæ in the haw-berries I have not seen, nor do I know if the black moth is ever produced therefrom, I get it only out of apple trees. Neither am I prepared to give an opinion as to the specific identity or distinctness of the two forms, which certainly are not specially separable respectively into sexes. There may have been here, as in other instances, a concomitant continuous divergence of plants and insects from an aboriginal stock, till species were established.

But whether there be now one or two species, or whether the dark form be Haworth's *Recurvaria atra* or not, which is to me a moot point, in any case it is clear, I think, that the moth with the white vitta along the inner side of the fore-wings cannot be regarded as the type of his *R. atra*, which he thus describes:—"Alis anticis toto atris, posticis toto nigris, ciliis profundissime plumbeis;" and then follow two varieties: β , "Alis anticis margine interiore obsolete cinereo. An distincta species?" γ , "Alis anticis stria seu vitta, a basi marginis tenuioris post medium usque ad costam, alba" (Lep. Brit., p. 554). Curiously, the latter is cited as the type of Haworth's species, but if the light-marked form (the var. γ of Haworth) be proved to be distinct, it will want a name, unless indeed it be the *Alucita Hellerella* of Duponchel, as Staudinger and Wocke put it (Catalog., p. 319, No. 2584). *Ela-chista putripennella*, Zeller, is also cited by them as a synonym of *L. Hellerella*. *L. atra*, type, is not mentioned. If, therefore, our dark form be specifically distinct from the light one, and it be not accepted as the *R. atra*, Haworth, it also will be in need of a name.*—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: July 29th, 1882.

Larva of Coriscium sulphurellum.—Ernst Hofmann, in his "Verzeichniss württembergischer Kleinschmetterlinge," published in the "Jahresheften des Vereins für vaterl. Naturkunde in Württemberg, 1882," says of *C. sulphurellum*, "Larva in May in cone-shaped leaf-ends of honeysuckle. Pupa in a flat, oval cocoon."

As this was quite news to me, I have sought diligently in other recent publications for confirmation of it.

Snellen, in his "De Vlinders van Nederland," of which the Micro-Lepidopterous portion, extending to 1118 pages large octavo, appeared this year, says of *C. sulphurellum*, "Larva still unknown." Rössler, in his "Schuppentügler" of Wiesbaden, published 1881, says of this species, "Once taken at the beginning of July near alders, on which, according to Noleken, the gelatinous-looking dirty white larva with a brownish head feeds in cone-shaped leaf-ends; according to E. Hofmann on honeysuckle."

* It is possible that Herrich-Schäffer's *Tebenna vinolentella* may be intended for our black apple feeder, which I have myself bred from larvæ found in the middle of May, in the stems which bear the cluster of apple-blossoms, but Herrich-Schäffer says "found on vines in July."—H. T. S.

Turning then to Nolcken's "Lepidopterologische Fauna von Estland, Livland und Kurland," of which the Micro-Lepidopterous portion appeared in 1870, we read that "on the 24th July, 1862, I obtained a specimen from a larva which I had not noticed more closely. This lived, if I am not mistaken, on alder, and was gelatinous-looking dirty white, with transparent internal canal and brownish head." Nothing is, however, here said of how the alder leaf was treated, the *cone-shaped leaf-ends* mentioned by Rössler (though likely enough if the insect really fed on alder) is not information supplied by von Nolcken. Moreover, the latter throws an air of doubt over the specimen having been really bred from alder, by saying, "*if I am not mistaken*," a parenthesis which is not quoted by Rössler.—H. T. STAINTON, Mountsfield, Lewisham: August 16th, 1882.

Gelechia maculiferella at Lewisham.—A week ago I could have said not only that I had never taken this insect, but that I had never seen it alive on the wing (having only once seen a living bred specimen). On the evening of Saturday last, August 12th, walking by the side of a hawthorn hedge, I noticed some dark grey moths on the wing, which I could not at a glance recognise; having no net in my hand, I made use of my hat, and was startled to see for a moment (for he was soon out of my hat again) a specimen of *Gelechia maculiferella*. Being near home I went and fetched my net, and as long as the day-light lasted I was fully occupied boxing this species, and secured 16; perhaps the most singular thing was that I did not, when boxing them in the dusk, without any clear knowledge of what was in my net, box a single moth of any other kind. There must have been hundreds on the wing along that hawthorn hedge that evening!

The weather was not propitious for several of the following evenings, but on Wednesday, August 16th, though they occurred in much less numbers than on the previous Saturday, I secured 9, and last night I boxed 6 more. Amongst the 31 specimens thus captured a fair proportion are females.

The insect, as is well known, belongs to that group of the genus *Gelechia* which is attached to plants of the natural Order *Caryophyllaceæ*, my bred specimen having fed in the larva state on *Cerastium semidecandrum*, near Frankfort on the Main (it emerged June 26th, 1863), and it is quite possible that it may feed and thrive on *Stellaria media*, a plant which is *very generally* distributed; still its occurrence in such plenty *on the wing* seems curious, especially when I bear in mind that its close ally, *Gelechia fraternella*, which used formerly to be very plentiful in the larva state in this neighbourhood, has scarcely ever been noticed by me in its perfect state, thus showing that some of this group, at any rate, lead very concealed lives.

Oddly enough, three specimens which I received from Herr Joseph Mann, of Vienna, more than 30 years ago, were taken by him on the trunks of *hawthorn* trees. Had I not actually bred the insect, I might thus have been led to the erroneous conjecture from the flight of last Saturday, that the insect had fed upon the hawthorn hedge it swarmed along.

For the series of *G. maculiferella* in my collection I am mainly indebted to Mr. C. G. Barrett, who supplied me liberally in September, 1874; I believe his specimens were captured near Peckham.—ID.: August 18th, 1882.

Abundance of Lithocolletis platani, Stdgr., at Pallanza.—On the 19th of last month (July), I arrived at Pallanza on the Lago Maggiore from the Val d'Anzasca, and at once set to work to examine the neighbourhood of the town. The elms, acacias, &c., on the shore of the lake only afforded shade sufficient to make the intense heat more apparent; so I started for the country along a road that was shaded on either side by fine plane-trees (*Platanus orientalis*). Even from a distance it became evident that the large leaves were dreadfully disfigured by the whitish mines of some larva, which, for the moment, I thought must be Dipterous. Closer examination shewed that the depredator was Lepidopterous, that, probably, no leaf was left unmined, that sometimes at least twenty mines occurred in a single leaf, and that they were *usually* on the under-side, *but occasionally on the upper-side*. Enquiring subsequently at Paris, "What *Lithocolletis* mines the leaves of plane-tree?", I was told it was *L. platani*, Stdgr., and that I should have collected the mines wholesale: the latter could have been easily done, but I doubt if any of the larvæ would have survived.

L. platani is a comparatively recently described species. It was first noticed by Staudinger, in the Horæ Soc. Ent. Rossicæ, for 1870, p. 277, and the describer states it was found by him at Bellaggio, on the neck of land between Lago di Como and Lago di Lecco (and also by Dr. Krüper, at Attica, in Greece), that it was in extreme abundance, and that sometimes forty mines (!) were contained in a single leaf, so that my own more humble estimate of "at least twenty" is quite eclipsed. Dr. Staudinger, in a letter to Mr. Stainton, dated August 29th, 1868, mentions that he had even found *one* leaf which contained *fifty-four* mines (See "Tineina of Southern Europe," p. 140).

I find that Emilio Turati, in his "Contribuzione alla fauna lepidotterologica lombardo" (Bull. Soc. Ent. Ital., 1879, p. 206), records it from Milan and Brianza, with the remark: "Comunissima sui platani, le cui foglie ne portano parecchie mine l'una accanto all'altra nella pagina inferiore."

The following observations occur to me:—Notwithstanding the extreme local abundance of the insect, it is still sufficiently rare in collections to be coveted as a desideratum.

The "Oriental-plane" is not supposed to be a native of Europe (properly so-called). It is extensively cultivated as a "shade-tree" in all the warmer parts of Europe. Is its leaf-miner equally widely distributed, but overlooked?

If a large number of eggs ("at least twenty") be laid on a single leaf, it by no means necessarily follows that all were laid by the same moth. But some instinct appears to be at work and causes the eggs (in any case) to be placed so far from each other as to enable the larvæ to avoid entering upon each other's mines: the leaves are large, so also are the mines.—R. McLACHLAN, Lewisham: *August, 1882.*

Reviews.

THE BUTTERFLIES OF NORTH AMERICA; by W. H. EDWARDS. Second Series. Part X. Boston: Houghton, Mifflin & Co. London: Trübner & Co. 1882.

The individual parts of this work have, so often as they appeared, been alluded to by us in terms of almost unqualified approbation.

Some would no doubt wish that the intervals between the publication of each part were not so extended. Others might qualify this by an expression of opinion that haste might foster inaccuracy. Mr. Edwards commits himself to no stated period of publication, and no one will presume to question the nervously-exercised care exhibited in each part.

Only two "species" are considered in Part X, viz., *Satyrus Alope*, F., and *Heliconia Charitonia*, L. To the former two magnificent plates are entirely devoted. As is usual, Mr. Edwards takes the philosophical view as to what should zoologically be termed a "species."

In his history of *Heliconia Charitonia* he has had an opportunity of philosophizing upon the habits of the only species of an otherwise extensive genus that falls within his faunistie limits. We need scarcely remind our readers that the genus has long been "notorious" in many ways, and much of the information here given (even for the species) has been discounted; but *all* the details are now before us.

The Part concludes with a commencement (from *Papilio* to *Argynnis*) of a "Synopsis of North American Butterflies; revised and brought down to 1882." A critical analysis of the author's views, as enunciated in this Synopsis, cannot fail to be instructive, and especially so, if made in conjunction with that of the writings of contemporary authors.

RHOPALOCERA MALAYANA, a description of the Butterflies of the Malay Peninsular; by W. L. DISTANT. Parts I & II, April and July, 1882. London: The Author, care of West, Newman & Co. Royal 4to.

We have before us the first two parts of this truly magnificent work, the inception of which was due, in the first instance (as the Author states), to Mr. D. Logan, of Penang. The Author's former residence in the Straits Settlements peculiarly fits him for the production of a work such as this. Judging from the two parts already published, it bids fair to take a scientific position far above the ordinary run of "Butterfly books." The descriptions are clear, and are always accompanied by copious comparative, geographical, and philosophical notes, showing that the Author has thoroughly read up his subject. The plates (of which there are four in each part) are at present in advance of the letter-press, and are in the best style of chromo-lithography, with occasional supplementary "touching up" by hand, every species being figured (as are also the more prominent varieties). It might have been better had the title of the work been limited to that indicated in the second half of the actual title, the first half being open to a far wider interpretation than is warranted by the second.

AN ILLUSTRATED ESSAY ON THE NOCTUIDÆ OF NORTH AMERICA, with "a Colony of Butterflies;" by AUGUSTUS RADCLIFFE GROTE, A.M., &c. Pp. 1—85, with four coloured plates. London: John Van Voorst. 1882. Royal 8vo.

An exact counterpart, so far as external appearance is concerned, of Lord Walsingham's "*Pterophoridae* of California and Oregon." The first 23 pages are occupied by a lengthy Preface, in which is a good deal of rudimentary information, that might well have been omitted, as already familiar to every Entomologist; also very instructive details of the progress of knowledge of North American *Noctuidæ*, in which the Author modestly gives himself but small credit; some excessively severe strictures on a prominent economic Entomologist (the work is dedicated to another equally prominent); and finally, an enumeration of those workers who have helped the Author, the last named being Mr. George Norman, whose decease we chronicle below. "Structure and Literature" form the second chapter, and will repay careful reading.

Then follows "Notes on Mr. Walker's types of North American *Noctuidæ* in the British Museum," which are succeeded by descriptions of 45 species, every one of which is figured. We think it would be impossible to surpass these figures, either by care in engraving, or by delicacy or truthfulness of colouring, and they may serve as models in all respects but one. Why *will* so many entomological artists persist in considering that *Lepidoptera* are *legless*?

"A Colony of Butterflies" is a dissertation on the manner in which *Eneis Semidea* came to inhabit its isolated position on the top of Mount Washington in New Hampshire.

It is no secret that bad health has compelled the well-known author of this little book to give up (let us hope only temporarily) his entomological labours, and that the extremely valuable collection of American *Noctuidæ* formed by him now forms part of our own National Collection. This latter fact probably explains why he has elected to print and publish the work in London.

Obituary.

George Norman died suddenly at Peebles on the 5th July last, in his 59th year, he having been born in Hull on the 1st January, 1824. He was educated, in part at least, in Germany, and was afterwards engaged in mercantile pursuits in his native town. In 1843, he first wrote in the "*Zoologist*," and for twenty years he continued to send to that Journal occasional notes in all branches of Zoology. After his retirement from business he removed to Scotland, residing, with occasional intervals, at Forres, and in 1869 and three following years he communicated to this Magazine copious lists of his captures of *Lepidoptera* in Perthshire and Morayshire. In 1874 and 1875 he was in Canada, and in our vols. xi and xii are long lists of the *Lepidoptera* he found in the province of Ontario. On his return he devoted his attention to the *Hemiptera* of Perthshire and Morayshire, making captures of many rare species and some new ones, which are recorded or described in vols. xv to xviii. In March last he went to Peebles, intending to work specially at the *Hemiptera* of that district, and now we have the sad news of his unexpected end. *Sic transit!*

Mr. Norman had much of the true spirit of a Naturalist, and was a very courteous and obliging man, thinking no trouble too much if he could thereby serve his friends and the cause of Entomology.

ON SOME POINTS IN THE ECONOMY OF *ZARÆA FASCIATA*.

BY J. A. OSBORNE, M.D.

On the 10th of September, last year, I found some larvæ of a saw-fly feeding on the leaves of snowberry in my garden. By the 22nd of the month they had all spun-up, making dark brown (resinous-looking) cocoons, which, at the end of March and beginning of April of the present year, yielded four female flies of *Zaræa fasciata*. On the 5th of June, following, a fifth female was excluded, besides these there were, May 30th—June 5th, four ichneumon flies of a smaller species; and on June 29th and July 10th, two of a larger species. All the saw-flies were females and all laid eggs which developed *parthenogenetically*. I do not know whether any of these eggs would have failed to develop for intrinsic reasons, but many perished through unfavourable external conditions. The eggs were laid singly in mines formed beneath the (upper) epidermis of the leaf; and, being inserted at the edge of the leaf, formed a sort of beading round its circumference. As snowberry is not a native plant I offered some of the flies leaves of honeysuckle (belonging to the same Order), and elder, and in these likewise they laid eggs which hatched out in due course; but the young larvæ refused to feed on these plants, though older ones eat honeysuckle freely enough. I had also eggs laid in leaves of osier and oak; and I have no doubt these flies would oviposit in almost any practicable leaf, and that the eggs would hatch if due conditions of moisture, &c., were maintained. Some eggs that were laid loosely in the pots, and were never in any leaf at all, I reared on pieces of glass by keeping them constantly moistened with pure water in a covered vessel. I likewise repeated the same experiment successfully with the eggs of *Nematus ribesii* (*ventricosus*, Kl.). The growth of the egg, then, by which it attains about three times its original size, can only be due to the imbibition of water, and owes nothing to any nutritive juices derived from the plant. In the case of *Nematus*, indeed, it is hard to see how anything but moisture could be derived from the plant, as no incision in the leaf is made, and the eggs are simply deposited on the under-surface of the nerves. After four moults the larvæ spun up among surface-clay and leaves: but although the earliest cocoons were made on 18th May, no flies have been excluded from any of them yet. It is probable, therefore, that the insect is not double-brooded as I at first supposed, and that the development of my last year's cocoons was hastened by their being kept in the house all winter. At present (2nd September) I find the

larvæ in great abundance on the snowberry bushes in my garden. I am not consequently in a position yet to say anything positive as to the sex of the parthenogenetic brood. Most of the larvæ, however, attained fully the size of those last year from which I got nothing but female flies. In the case of *N. ribesii*, when the larvæ are fed-up it is easy to distinguish the males from the females by the difference of size, the former being about $\frac{2}{3}$ the length and $\frac{1}{3}$ the bulk of the latter. A similar and equally marked differentiation into two sizes was observed among the full-fed larvæ of *Zaræa*, but very few of the smaller ones succeeded in making cocoons—many, indeed, of both sizes perishing at this stage.

The saw is of the usual S- or sabre-shape, with the distal convexity looking ventrally or forwards. Each sheath is barred transversely with lighter and darker (chitinous?) lines. The saw itself is not entirely separable from its sheath, as figured by Réaumur in the case of other saw-flies; but is connected with the sheath by short (muscular?) ligatures, running from the lighter (inter-chitinous) bars of the sheath to the back of the saw. The operation of making the mine and depositing the egg, which occupies $1\frac{1}{2}$ —2 minutes, is very easily witnessed, especially in the more transparent snowberry leaf, with the aid of a lens. The fly sits on the edge of the leaf holding it firm between the apical spines of the posterior tibiæ. The ovipositor being inserted under the epidermis is first thrust backwards, parallel with the edge of the leaf, to its full extent, and then swept round till it lies again under the edge of the leaf in front of the point of insertion, which is situated rather behind the middle of the mine—the saw all the while playing with short quick strokes, which gives it somewhat the appearance of watchwork running down. The mine so made has a shape or contour not unlike that of the human stomach, the place of insertion (of the saw) corresponding to the cardiac orifice of the stomach, and the anterior portion of the mine answering to the pyloric end of the viscus. The ovipositor is next brought back to a position midway in the mine and at right angles to the axis of the fly; and after a short delay the egg descends between the two blades with its long axis also at right angles to that of the fly. The egg is green in colour, and in shape crescentic with the horns rounded-off. While it is between the blades of the ovipositor the lowermost end (in advance) would correspond with what should be the posterior or caudal end; and the concave edge, looking forwards, with the ventral surface; supposing its parts to have the same relations as the eggs of other insects. But when the egg is escaping

from the blades of the ovipositor it makes a turn of 90° in the mine, by which the first-laid end comes to look forwards (*i. e.*, in the direction of the head of the fly), and the concave side to look upwards (*i. e.*, in the direction of the back of the fly); and so the position of the egg comes to be exactly the reverse of what it would have been if simply extruded backwards in a line with the parent. Nevertheless, the convex side, or what in the case supposed would have been the *dorsal* aspect, becomes the seat of the development of the embryo. Having withdrawn the ovipositor, the fly presses together the lips of the wound with the two valvular pieces between which the ovipositor lies when not in use, possibly having injected some glutinous liquid by means of which the aperture is obliterated. The mine is now a closed cavity, and, as the egg grows, shows like a little blister on the leaf. Generally no change whatever takes place in the parenchyma, but in a few instances I have observed a growth of rather large globular cells bursting off the epidermis covering the egg; and indicating perhaps a transition to gall-growth. I am not able as yet to say positively which end of the egg is occupied by the head of the embryo, but in all cases observed the ventral side of the embryo lay along the convex side of the egg, development commencing as usual in the *Articulata* (and *Vertebrata*) on the *neural* side. [*v. Huxley*, *Anat. of Invert.*, p. 667]. But at a certain stage in the development, the embryo will be found doubled-up in a loop with its ventral side occupying the middle; the first half of the dorsum, lying along the concave side of the egg, now become straight by the growth of the egg; and the posterior half along the convex side, while head and tail are in contact.

This is the position of the Lepidopterous larva immediately before hatching (*P. brassicæ*, *Rumia cratægata*, &c.), and how it gets into this position, if it develops in the usual arthropod way, is a point which I have only seen adverted to by Kowalevski. Speaking of the development of *Sphinx populi* and *Gastropacha pini*, he says (*Embryolog. Studien an Würmern und Arthropoden. Mémoires de l'Acad. imp. des Sciences*, &c., p. 56):—"Wenn der Rücken schon gebildet ist, biegt sich das Schwanzende des Embryo auf die Bauchseite und zwar so, wie wir schon beim *Hydrophilus* gesehen haben. Dem Hinterende folgend, dreht sich der ganze Embryo so, dass er jetzt der ihn noch bedeckenden serösen Hülle den Rücken zuwendet, und die Extremitäten erscheinen nach innen gerichtet. In diesem Zustande, mit fast vollständig ausgebildeten Organen, bleibt der Embryo vollständig in dem ihn umgebenden Dotter, den er nun mittelst der

unterdessen vollständig ausgebildeten Mundorgane zu verschlucken beginnt * * * die * Larve liegt [jetzt] schraubenförmig auf der Bauchseite zusammengerollt bis sie das Chorion zerreisst und ins Freie gelangt." The *Zaræa* embryo, at any rate, does not get into the loop position by any molar movement of this sort. When the posterior end of the growing embryo has reached the remote end of the egg, it is bent ventrally on itself, and so *grows* forwards till the tail comes to be in contact with the head. As the length of the embryo still continues to increase, the head is withdrawn to about the middle of the straight or upper side of the egg, and the larva, about to hatch, lies in a spiral, with the tail opposite the head on the other side of the body. It turns its sharp mandibles towards the shell, bites at it and draws it in till it is pierced, and, by means of a foot thrust through the opening, draws the flexible chorion still more within the power of the mandibles, which soon effect an opening large enough for its escape. This ingrowth ventrally of the caudal end of the embryo appears to be not uncommon in the *Arthropoda*, where the length of the embryo exceeds that of the shell; and occurs even in the case of the globular egg of *Astacus*, as described by Huxley (The Cray-fish, p. 203). In the case of an embryo making such a revolution in the egg, as that described by Kowalevski, the head would occupy two different positions in the same end of the egg, relatively to two opposite sides, before and after the revolution. The egg of *Rumia cratægata* would be specially favourable for making this observation; the shell at the cephalic end being distinguished by an ellipsoidal ridge: the pointed end of the ellipsoid corresponds with the position of the head of the larva just before hatching; and, of course, the rounded end to that of the tail. While the embryonic venter is still external, the relative positions of these parts, on Kowalevski's principles, should be just the reverse.

Milford, Letterkenny, Ireland:

4th September, 1882.

Capture of Crabro gonager, ♀, in Gloucestershire.—I took a ♀ of the above rare species of *Crabro*, at Wootton-under-Edge, Glos'ter, on the 29th August, this year. I found it, together with considerable numbers of *C. podagricus*, on the common garden parsley. This is, I believe, the first record of the capture of the ♀ in this country, although I have taken the ♂ several times near the same spot. In comparing my specimen with the description of *gonager*, given by Thomson in his "Hymenoptera Scandinaviæ," it appears to have the pale ring of the posterior tibiæ unusually narrow, and the scape of the antennæ entirely black.—VINCENT R. PERKINS, 54, Gloucester Street, South Belgravia: 11th September, 1882.

ON THE STRANGE *COLEOPHORA* REPUTED TO FEED ON
WHEAT IN RUSSIA.

BY H. T. STAINTON, F.R.S.

Some months ago I was sorely puzzled by being told that a new *Coleophora* had been lately described by Professor Lindeman as feeding on wheat, and that specimens had been submitted to me for my opinion some time previously.

I often now-a-days complain of the tricks my memory plays me, but as I could remember nothing of this mysterious chapter of *Coleophora* life, I sought to find some letter from Professor Lindeman amongst my foreign letters. Further, I have a habit of entering day by day in a little book the names of the writers of any Entomological letters I receive, and in the case of Foreign Entomologists, I also enter the dates when I write to them. On neither side of the entries in this book did the name of Professor Lindeman occur, nor could I find any letter from him had ever reached me!

It was some weeks before this mysterious occurrence was cleared up, though like many other mysteries, when the explanation did come it was simple enough. The fact was I had had no direct communication with Professor Lindeman at all. He had communicated with the "Société Impériale des Naturalistes de Moscou," that Society had put itself in communication with the Entomological Society of France; the problem for solution on reaching Paris fell into the hands of my friend Monsieur Ragonot, and he, writing to me soon afterwards, propounded the question to me, "Here are certain *Coleophora* cases; what species do they produce?"

The name of *Professor Lindeman* did not occur in the query which I received, nor was any mention made of *wheat*. I was simply informed that the Society of Moscow had sent these cases to the French Entomological Society, with the notice that *great quantities* of them had been found on the stems of grasses in Southern Russia. Was it wonderful, then, that I had no recollection of Professor *Lindeman* and his *Coleophora* on *wheat*?

Monsieur Ragonot, who is himself a very high authority in all matters relating to *Micro-Lepidoptera*, remarked, in his letter of November 20th, 1880, "These cases remind me of those of the species attached to the *Caryophyllaceæ*, such as *silene*, *dianthi*, *nutantella*, &c., and it is possible that such a species peculiar to Southern Russia, after having fed on a low plant, would leave it and mount up the stems of grasses." (See *Annales de la Soc. Ent. de France*, 1881, Bull. xiv).

My own view of the cases in question was expressed in my letter to Monsieur Ragonot of December 8th, 1880. "I think the Russian *Coleophora* cases come nearest to those of *C. inflatæ*, so this certainly confirms your idea that they belong to the group which feed on the *Caryophyllaceæ*."

It was not till the beginning of last June that I had an opportunity of studying in the pages (39—42) of the "Bulletin de la Société Impériale des Naturalistes de Moscou; année 1881," Professor Lindeman's article on "*Coleophora tritici*, ein neues schädliches Insekt Russlands."

Professor Lindeman says, "Two years ago I received from the government of Poltawa some cases of a *Coleophora* larva, which, living on the ears of summer-wheat, eats out the grains. Whilst the wheat is growing these larvæ are not perceptible, since they make no striking change in the ears, and eating only the grains beneath the chaff lead a well-concealed life. But in the autumn when the corn is thrashed, the firm and hard cases are thrashed out with the grain. Universal astonishment was caused by the quantities of these small cases, which, from their lightness, are readily sorted out from the grains of corn, forming entire heaps."

"A year later, in the autumn of 1880, I again received, but this time from the government of Riazan, the same *Coleophora* cases, with the notice that on thrashing the oats these had been thrashed out from them, and that too in such enormous quantities, that they at once attracted the attention of the labourers. At the same time the results of the harvest turned out very badly, which may certainly be, at least to some extent, attributed to these *Coleophora* larvæ."

"The cases I received contained only dead, but quite full-grown larvæ. Those sent the first time were all dried up; those sent the second time were in spirits, so that I had no possibility of rearing the perfect insect. This I the more regretted as no author seems to have described any species of *Coleophora* feeding on corn, and no where in Europe has the attention of Entomologists been drawn to such an injurious insect."

Professor Lindeman then says, "On meadow-grasses (*Holcus* and others) some *Coleophoræ* have been mentioned by Kaltenbach and Wocke, the larvæ of which feed on the seeds of grasses (*Col. lixella*, *murinipennella*, *cæspititiella*), but my cases are quite distinct from these."

This last sentence contains an important mis-statement; as none of the *Coleophoræ* to which he is there alluding feed on the seeds of grasses. *Murinipennella* and *cæspititiella* feed on the seeds of *Juncaceæ*,

and *C. livella* (and he might have added *ornatipennella*) feed after their earliest youth on the leaves of grasses. (The larvæ of both these last-named species feed in autumn in their infant state in the flowers of labiates, and do not attack the leaves of grasses till the following spring.)

Professor Lindeman adds: "I had hoped, in the autumn of this year (1881), to receive some living larvæ of this species, being anxious to breed from them the imago; but in both these expectations I have been disappointed; I, therefore, publish what I at present know about this new foe to our corn-crops, in order that the attention of others may be drawn to the subject."

He then mentions having, through the medium of the French Entomological Society, submitted some of these cases to Ragonot and Stainton, and having received in reply the assurance that "the cases undoubtedly belonged to a *Coleophora*, which should be in the group which comprised *C. nutantella*, Mühlig, *C. silenella*, H.-S., &c., and that it was probably quite new," and that, on the strength of this communication, he ventured, without knowing the perfect insect, to name it provisionally *Coleophora tritici*.

As the cases came to Paris as those of a *Coleophora* found on grass-stems, and no mention was made of the larvæ having fed on the grains of wheat or oats, the entomological doctors consulted were scarcely in a position to pronounce an opinion likely to be of much value. I do not for a moment suppose that they were purposely kept in the dark, the mistake has probably arisen through the transmission of the query through so many different hands. I, however, call attention to the fact, as probably it may tend to prevent any similar blunder in future.

Professor Lindeman remarks that "the cases are composed entirely of silk, "without any intermixture of grains of sand, or any other foreign substance;" but, he says, "that they are so firm and hard, that the operation of thrashing the corn does not injure them." I am not sure that he does not even mean that the larvæ escaped uninjured after undergoing the process of thrashing! Silk of such a texture ought surely to be worth cultivating!

This notice of Professor Lindeman's has reminded me of a *Coleophora* larva I once received from the late Mr. J. F. Brockholes. His letter is dated, "16, Cleveland Street, Birkenhead, October 10th, 1859," and reads as follows:—

"I have lately found the enclosed *Coleophora* cases in some plenty in a stackyard near here. They were on young oats growing from

shed seed and grass. Two or three stems of the grass are enclosed, as also some oats. There seems to be a difference in the cases as well as larvæ. There may be two kinds among them. They are new to me, and I do not find them in the volume of the genus lately published. What are they?" As the grass sent did not appear to be eaten in any way, I wrote for some further information, but was unable to obtain any; Mr. Brockholes' reply, dated October 23rd, 1859, was as follows:—

"I can give you no information at present about the *Coleophora* cases. The grasses are dying down, and the cases seem to be principally made up for the winter. In spring I shall be better able to find out something about them."

The case I have described as "ochreous or brownish, with some darker stripes, rather stout and short," and, if I am not mistaken, it was very similar to the case of *annulatella*; thus differing very considerably from the case of Lindeman's *tritici*.

In the answers to enigmas, at p. 114 of the Entomologists' Annual for 1861, we read of these Birkenhead stack-yard larvæ: "Mr. Gregson sent me a specimen of *Coleophora annulatella*, as having been bred from the larvæ referred to last year. But I am strongly disposed to think some error has crept in here."

I am now rather disposed to think, however, that the larva may, indeed, truly have been those of *annulatella*, and that the *error which had crept in* was in the assumption that they had fed either on the oats or on the grass. *Annulatella* occurs by hundreds on the *Atriplex* which grows along the ground in corn fields; would it be at all wonderful if some dozens of the larvæ got carried to the stack-yard?

Mountsfield, Lewisham:

August 18th, 1882.

NATURAL HISTORY OF *EPHESTIA PASSULELLA*.

BY WILLIAM BUCKLER.

On the 4th of September, 1881, Mr. Sydney Webb very kindly sent me a batch of eggs of this small species, laid loosely by the parent moth, which he had captured in the Oil-Cake Company's Warehouse a short time before.

The eggs began to hatch on the 8th of September and continued to do so at intervals for two or three days, and the little larvæ were confined with some pieces of the pod of the "Locust-bean" of commerce, which Mr. Webb had also kindly provided for them, and in course of

a week they could be seen to have grown, and by end of the month very much more grown, and by the middle of December some of them were as long as 6 mm.

During the winter months I saw but little of them, when from time to time I found it needful to replenish their food in consequence of the large accumulation of frass at the bottom of their residence (resembling coffee-grounds) they having denuded the beans by devouring the substance of the pod; and, moreover, they had already made, and continued to make, any observations on my part very difficult, and of their moulting impracticable, by completely obscuring their surroundings with a dense spinning of whitish-grey silk; and they had lined with silk the little tunnels excavated amongst the refuse.

By the beginning of April, 1882, they, however, began again to show themselves and were grown considerably, and yet required a further supply of their food, as by this time a prodigious quantity of frass had been made.

The first specimen of the perfect insect was bred on the last day of April, others followed on the 12th of May, others again on June 1st and 4th, and the last on the 14th of July.

The egg of *passulella* is elliptical in shape with bluntly-rounded ends, and finely pitted surface, whitish at first and soon of a delicate straw-yellow; two days before hatching it assumes an ochreous tinge, and the next morning a light brown spot appears at one end, and within a few hours the larva is hatched.

At first the young larva is of a whitish-ochreous tint with a brown shining head and very narrow plate across the second segment, and when nearly a month old has a faint tinge of reddish, or pinkish-brown, the head very dark brown and the plate still narrow, but at this time with very little more colour than the body.

At the age of three months the body is of a light brownish-pink colour with reddish-brown head and a blackish-brown plate on the second segment, and another on the anal flap, and there is a pinkish-brown dorsal line showing very faintly; the minute tubercular shining brown dots can be very well discerned.

When full-grown the larva measures 10 mm. in length and is of moderately slender proportions, cylindrical though tapering very slightly at each end, the segments having a subdividing wrinkle across the middle of each, and the legs are much under the body; in colour the head is reddish-brown and glossy, and it has a margin of pale skin in front of the shining black and brown neck-plate, which is dorsally divided with a line of the pallid ground colour of the thoracic seg-

ments, and beyond them this ground-colour imperceptibly is changed to a faint flesh-colour, in some instances a very pale tint of drab; the small dark brown and shining tubercular dots, each furnished with a fine hair, are ranged on either side of the back in twos forming in line along the sub-dorsal region, those on the front of the thirteenth segment are large and squarish; the anal plate is of the same dark brown colour and rather heart-shaped; a single row of dark brown dots is along the side and others are beneath; on either side of the second segment is a largish black-brown shield-like glossy spot in front of the spiracles; another, similar, occurs on the outside of each anal leg, the ocellated spot on either side of the third and twelfth segments is black with white centre; the skin generally is soft, smooth and glistening: some individuals show a faint purplish-brown dorsal line, while others have only a faint darkness sliding to and fro beneath the skin of the seventh and eighth segments.

When full-fed the larva envelopes itself in a pearly-greyish oval cocoon of silk about 8 mm. long by 3 in diameter, smooth within but thickly covered outside with grains of frass spun together and situated generally in some excavated portion of the pod it has fed in.

The pupa is from $5\frac{1}{2}$ to 6 mm. in length and is of an ordinary form, with prominent eye-pieces and longish wing-covers; the tip of the abdomen ending in an excessively small round thorny boss; its colour darkish bronzy-brown and shining.

Emsworth: *August 14th*, 1882.

NOTES ON CERTAIN MICRO-LEPIDOPTERA.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Finding it necessary to go through Professor Zeller's paper on "Exotische Microlepidoptera" in the "Horæ Societatis Entomologicæ Rossicæ" for 1877, before attempting to do anything further with an American collection in my hands, I was enabled to recognise several synonyms which I think it important to put on record.

The genus *Donacoscaptes* is very closely allied to, if not identical with, Walker's genus *Ertzica* from Java (Lep. Het. Suppl., v, p. 1768): if identical, Walker's name will take priority.

Argyria obliquella, Zeller, is my *Argyria candida*, which it will supersede: both are described from Japan.

Melissoblaptēs gularis, Zeller, is my *M. tenebrosus*, which it will supersede: both are from Japan.

Anchoteles perforatana, Zeller, is Walker's *Uzeda torquetana* from Rio Janeiro (Lep. Het., xxviii, p. 443), of which it will be a synonym.

The genus *Choregia* is identical with *Tortyra*, Walk., *C. fulgens*, of Felder and Rogenhofer, being a synonym of Walker's *Tortyra spectabilis*.

The genus *Acureuta* is Walker's *Tiquadra*, = *Oscella*, = *Manchana*, as already pointed out by Lord Walsingham (Trans. Ent. Soc., 1881, p. 235).

The genus *Setomorpha*, Zeller, will supersede my *Chrestotes*.

Psecadia xanthorrhoea, Zeller, is probably *P. notatella*, of Walker (Lep. Het., xxviii, p. 536, n. 17), the only difference that I can discover in Walker's type is the absence of the black spot on the fringe of primaries.

Psecadia circumdatella, Walker, falls into Walker's genus *Azinis*.

Cryptolechia radicalis, Zeller, appears to me to be *C. confixella*, of Walker; but this must, for the present, remain doubtful.

C. læviuscula, Zeller, is identical with *C. scitiorella*, = *C. filiferella*, Walker.

C. muscula is evidently nearly allied to my *C. urbana*, and *C. residuella* to my *C. strigivenata*.

C. Erschoffii, Zeller, appears to be Walker's *C. humeriferella*.

Antæotricha purulenta, Zeller, is allied to *A. adjunctella*, and *A. lignicolor* to *A. basirubrella* (both described by Walker under *Cryptolechia*).

The genus *Epicorthylis* is synonymous with Walker's *Vazugada* (Lep. Het., xxix, p. 803); *E. cinnamicostella* being closely allied to *V. strigiplenella*.

Gelechia scutella, Zeller, appears to me to be Walker's *G. subscriptella*, from which it only differs in the slightly browner pale markings on the external area of the primaries.

Æcophora dichroella, Zeller, is *Æ. divisella*, of Walker, and is closely allied to *Æ. concisella* of the same author.

Under *Æ. irruptella*, Walker, it appears to me that Professor Zeller has another species which will account to him for its wide separation from *Æ. arabella* in Walker's Catalogue: it certainly does not strike me as being nearly allied to that species, the primaries being of a bright, shining, pale straw-yellow, with the costal margin purplish-brown; the external two-fifths are purplish-brown, but deeply incised close to the costa, the yellow ground-colour being projected half way across it towards the apex; the secondaries are golden-cupreous, slightly purplish towards the outer margin; the head is dull pale yellow, the body greyish-brown, with the collar and tegulæ darker and bluish; the hind tibiæ are clothed with long brown (not

ochreous) hair: the entire insect is decidedly smaller than *Æ. arabella*, and much more nearly allied to *Æ. divisella*.

Æ. trijugella, Zeller, is Walker's *Æ. bracteata*.

Æ. griseicostella, Zeller, is certainly Walker's *Æ. productella*: the colouring of the secondaries is very variable, and Walker's "fawn-coloured" stands for half a dozen different tints; in this case it is a dark greyish-brown.

I believe that the above notes will clear up most, if not all, of the synonyms in connection with this most valuable paper of Professor Zeller's.

British Museum: 31st August, 1882.

DESCRIPTION OF A NEW SPECIES OF *PENTATOMIDÆ* FROM MADAGASCAR.

BY W. L. DISTANT.

The genus *Memmia* is peculiar to Madagascar, and, like many other genera belonging to that fauna, is a modification of a closely allied African genus. In this case, *Memmia* is allied to *Atelocera*, both of these genera having but four-jointed antennæ, the second joint of which in *Atelocera* is dilated, and in *Memmia* is simple.

Two closely allied species have hitherto represented the last named genus; a third, collected by the Rev. Deans Cowan, is here described; it can be at once recognised by the great length of the scutellum.

MEMMIA COWANI, *n. sp.*

Head black, coarsely punctate, with a short, central, basal, longitudinal, ochraceous fascia; antennæ black, the basal joint just passing apex of head, second joint much the longest, third joint slightly longer than fourth; rostrum black, not quite reaching posterior coxæ. Pronotum reddish-ochraceous, very coarsely and darkly punctate, the lateral margins and a central longitudinal fascia, pale ochraceous and lævigatæ; on the inner-side of lateral margins the punctures are somewhat confluent, thus rendering the colour almost black; anterior portion of lateral margins deeply crenulate; remaining portion, including lateral angles, which are sub-prominent and rounded, very finely and indistinctly crenulate. Scutellum long, passing the apex of corium, reddish-ochraceous, coarsely and darkly punctate, with an indistinct, central, longitudinal, ochraceous line. Corium reddish-ochraceous, coarsely and darkly punctate, with a pale lævigatæ spot on posterior portion of disc, and the base of costal margin also pale lævigatæ. Membrane small and very pale fuscous. Abdomen above black; connexivum pale ochraceous. Body beneath and legs black, abdominal margin pale ochraceous. The under-side of the body is also more or less thickly clothed with ochraceous pubescence, which, on the abdomen, does not outwardly extend beyond the stigmata, nor inwardly to discal centre. Anterior femora spinous beneath, more prominently so on apical third.

Long. 17 mm. Exp. pronot. ang., $9\frac{1}{2}$ mm.

Hab.: Madagascar.

East Dulwich: September, 1882.

RE-DISCOVERY OF *PERLA FERRERI*, PICTET.

BY R. McLACHLAN, F.R.S., &c.

So far as I am aware, nothing has been published concerning *Perla Ferreri* since it was first described by Pictet in his "*Perlides*," p. 210, pl. xviii, figs. 1 and 2, more than 40 years ago (1841). He wrote.—"*La Perla Ferreri* se trouve dans les environs de Turin; le Musée de Genève en possède deux exemplaires mâles qui faisaient partie de la collection qui lui a été léguée par M. le Chanoine Ferrero."

The species is remarkable from its ample (even in the ♂) blackish wings, nearly wholly black head and thorax, and yellow abdomen, with black tails.

At Geneva, I had the opportunity of seeing the two typical males, which, at present, are not in the Museum, but at the residence of the widow of the late A. Edouard Pictet (son of the describer). But I was not able to make a critical examination.

When in the beautiful Val Anzasca, on the 17th July, I visited the pretty waterfall that descends from below the mountain village of Calasca, and at its foot captured a female *Perla* that is undoubtedly *Ferreri*. It quite agrees with Pictet's description, excepting sexual differences.

The anterior-wings expand to 51 mm. (Pictet gives 41 mm. for the ♂). As structural sexual characters, it should be noticed that the margin of the last dorsal segment is truncate, and that the egg-valve is rather large and semicircular. It was not remarked in Pictet's description that the anterior margin of the wings (costal and sub-costal areas) are *slightly* tinged with greenish in the living insect, but this tinting is a character common to many *Perlidae*; in this case it chiefly results from the costal and sub-costal nervures, and the costal nervules, being of a paler colour than the rest of the neuration (which is blackish).

Entomology awaits the advent of some one with sufficient courage to attack the *Perlidae* (even the European species) in a monographic manner. Pictet's work was admirable, as all those who have had occasion to consult it will readily admit; but it requires supplementing in accordance with the experience gained during the more than forty years that have elapsed since its appearance. When I regard my own accumulations of materials in this family (even in European forms), and feel to what a small extent they are arranged and determined, the question constantly recurs to me:—Will a specialist in *Perlidae* ever appear?

Lewisham: August, 1882.

Notes on the larva of Phycis carbonariella.—This species being usually very abundant on the dry heaths in this district, I determined last year, if possible, to work out its history. Therefore, on the 2nd of July, I went up to Crossland Moor, a heath almost close to the town, and, in a very short time, had netted and boxed some thirty imagos, a fair proportion of which were females. Several of them immediately deposited, and the eggs were oval, though rather pointed at the ends, the colour a bright light purple. On the 11th a number of them hatched, and the newly-emerged larvæ were very lively, red with black segmental divisions, and the polished head and frontal plate nearly black. Ling, sallow, &c., were at once supplied, and they soon took to the sallow, quite forsaking the ling and heath, which I suppose must be the natural food, as there is no sallow on the heaths where the moths occur. The red colour was retained until they were about a quarter of an inch long, but after the next moult they became uniformly dull black or brownish-black, the black head and frontal plate only having a polished appearance. I was from home at the time the change took place, so cannot tell exactly on what date the moult was effected. Up to this time, too, they had fed *in* the leaves, eating the inside between the upper and under skins; but after this they spun together two or more leaves, and ate from the outside of the leaf, only, however, the softer parts, leaving the ribs and veins. On July 28th they were three-eighths of an inch long, and, by August 5th, half an inch had been attained, when I took down notes on them as follows:

Body slender, cylindrical, and of nearly uniform width, tapering only slightly towards the anal extremity; head a little narrower than the second segment, rounded, the mandibles prominent; both it and the frontal plate polished; segmental divisions well defined, and from each segment being also divided by a transverse depression the skin has a rather wrinkled appearance; there are a few scattered short hairs.

The colour of almost the whole of the larva is an uniform dull black, showing brownish at the segmental divisions only, though an exceptional larva is entirely of this brown tinge. The black specimens have the ventral surface slightly paler, but there are no other discernible markings of any sort. Altogether it is one of the most unicolorous larvæ I ever saw, and no species on our list is more appropriately named, the larva, imago, and habitat (the burnt charred parts of the heaths), being almost equally black.

For some days the larvæ had been unaccountably disappearing, but how and when I never could make out, as their cage seemed close-fitting enough. By the 16th I had only two or three left, and as these seemed disposed to hibernate, I described the largest again, as follows:

Length, three quarters of an inch, and proportionately stouter than when last described; the segments rather plumper, and the wrinkled appearance of the skin in the earlier stage partly lost. Raised tubercles, too, have now made their appearance, but are not very conspicuous. In other respects the shape is the same. The ground-colour is now a little paler, a distinct, but very dark, olive tint is seen through the dull black, and the alimentary vessel shows as a quite black dorsal line. Head, frontal plate, and tubercles polished, black. There are no other perceptible markings. Ventral surface and prolegs dull dark olive-green, the legs black.

The larvæ fed on the willow leaves; but one I found had evidently excavated the soft stem, causing the leaves to droop and wither: this was one of the last larvæ I saw, and suggested it was just possible the disappearance of the other larvæ might be accounted for from their having been thrown away unperceived in the old stems, though I can scarcely credit that I overlooked them in such a way.

In the spring I could find none of the two or three hibernated larvæ, so made several journeys to the heath, in order to complete the history of the species; but neither by sweeping nor by close searching could I detect any trace of the larvæ, which, however, may perhaps be accounted for from the fact, that three or four excursions later for imagos only produced three specimens, where the previous year they were in profusion.

As I obtained no more eggs, I think it best to publish this incomplete history, as in the larva three-quarters of an inch in length, there is, I think, little doubt the adult markings had been quite or almost attained.—GEO. T. PORRITT, Huddersfield: September 2nd, 1882.

Occurrence of Acrobasis consociella, var. sodalella, in Pembrokeshire.—Early in June last, I found in a wood of stunted oaks, some miles from here, blotched and discoloured bunches of oak leaves, evidently the habitations of larvæ of *Acrobasis consociella*. The larvæ were still feeding, generally but one in each bunch of leaves. They fed up without difficulty, and in July the moths emerged; they prove to differ from ordinary *consociella* in several respects—in the larger size—equalling *suavella*, in the more richly crimson-grey central band, and in the form of the first line on the fore-wings, which bounds the basal pale patch. This line is a variable character in this species. In a German type which I have, and of which the colour is very pale, it is decidedly oblique and very nearly straight, in ordinary English specimens it is more curved and indented, so as to become more perpendicular; this variation in form is still more strongly shown in the specimens that I have lately reared, and the variation seems to culminate in a type received from Professor Zeller of his *Ac. sodalella*—which, however, the Professor is now convinced is only a variety of *consociella*—and in which this line is almost straight across the wing; *sodalella* is larger than ordinary *consociella*, and has the colouring brighter—though, apparently, by no means so bright as in the present specimens; and its markings, though not very distinct, are otherwise accurately the same as theirs.

I am quite of Prof. Zeller's opinion with regard to this form, but it is such a handsome variety of *consociella* as to be well worthy of notice. All my specimens reared here are *large*, but one or two are of the colour of ordinary *consociella*, and one has the left fore-wing of the ordinary colour, and the right of the bright colour of the variety.—CHAS. G. BARRETT, Pembroke: 16th September, 1882.

Hermaphrodite specimen of Lasiocampa trifolii.—Early in August I had much pleasure in breeding a fine hermaphrodite specimen of *trifolii*. In the antennæ the difference is most distinct, that of the right hand, or male side, being deeply pectinated, the left, or female, quite plain. In the wings the right hand, or male, side is smaller and a little lighter than the female, with the outer marginal band a little lighter than usual. On the female side the central spot is more, and the outer mar-

ginal band less, distinct than in the majority of specimens. On the upper-side the body is equally divided, being a little lighter on the male side than the other. On the under-side, however, the difference in colour on the body is most distinct, the male side being a light buff and the female a deep chocolate; the line dividing the two colours is so distinct that it has the appearance as of two specimens having being cut in two, and the right hand side of the male joined on to the left hand side of the female. The extremity of the abdomen looks decidedly peculiar with the fluffy tail of the male on the right, and the plain roundness of the female on the left.—R. A. FRASER, Seafeld, Abbotsford Road, Crosby: *September, 1882.*

A Lepidopterous larva destructive to rice in Panamá.—In a letter lately received from Chiriqui, from Mr. G. C. Champion, he says that immense numbers of a larva had recently appeared suddenly in the rice plantations of the district, and were doing a great deal of mischief, so much so, that for the past week the natives had been holding prayer-meetings nearly every evening on this account, rice being the staple article of food in Chiriqui, far more so than bread in England.

Mr. Champion enclosed a sketch of the larva, and an imago. The larva is very like that of *Hadena pisi* in general appearance, and about the same size when full-grown, it is pale yellowish-white in colour, with two broad, longitudinal black stripes along the back, and a few fine dark longitudinal lines mixed with the yellowish ground-colour.

The pupa is enclosed in a slight silken cocoon between the leaves of the rice, and remains only a few days in this state.—W. W. FOWLER, Lincoln: *Sept., 1882.*

[Mr. Butler informs us that the moth is a species of *Remigia*, Guenée (*Noctuidæ*), near "*Ophiusa delinquens*," Walker, but much darker.—EDS.]

NOTES ON MICRO-LEPIDOPTERA.

Laverna Hellerella and *atra* distinct species.—In reference to Mr. Douglas' remarks on the distinctness of the two species of *Laverna*, the one from apple shoots feeding in spring and the other from hawthorn berries in autumn, I have no doubt whatever of the fact that they are two species. I have bred both, and neither form varied in the slightest degree, nor were they in any way associated together. *L. Hellerella*, the larvæ of which feed in autumn in hawthorn berries, always emerged with me as the light species, and the one we call *L. atra* from apple always the dark one, and how they could have been confounded I cannot understand.

Gelechia maculiferella bred from *Cerastium*.—I bred this insect freely last year from a small plant on the sand hills at Lytham, which I believe to be *Cerastium semidecandrum*. The larvæ fed in the flower shoots and seeds, and spun up in sand cocoons.

Gelechia ligulella, *vorticella*, *tæniolella*, and *Sircomella*.—I feel sure that three of these species are only forms of one, viz.: *ligulella*, *tæniolella*, and *Sircomella*. I took a large quantity of them this year, and they were swept from *Lotus corniculatus*, different sexes in the different forms being freely paired. This is, I think, a convincing proof of their unity of species. *Vorticella* is also so like the others (the

only difference being in the form of the fore-wings, which may be a variation from local reasons), that I should place it also as a form. If any one takes *vorticella* freely, and would kindly allow me to inspect a series, I should thank him much and return them uninjured.

Nepticula betulicola.—Last year, when breeding *Nepticula betulicola*, I thought that another species was emerging with them from similar larvæ, but on a more extended trial this year, I found that the two sexes differ considerably, and thus my doubts were solved. *Betulicola* males are rather smaller and browner; frequently the fascia does not extend quite to the costa, and the head is fuscous with white eye caps. *Betulicola* females are purplish from the base to the fascia, which extends quite to the costa, and the head is yellow. This insect varies in intensity of colour with the temperature and climatic conditions of the season. Some years ago in a hot summer I bred some as brilliant as *alnetella*.

Nepticula regiella bred.—I had last autumn collected considerable quantities of yellow larvæ blotching whitethorn, in order to find out the larva of *Nepticula ignobilella*, which I am at present unable to separate from that of *gratiosella*. The result was that I bred this May plenty of *gratiosella*, none of *ignobilella*, and one *regiella*, in the room. As I had larvæ from Witherslack and Preston (viz.: from limestone and sandstone), I am unable to determine the district from which it came, but hope to do so this year. I have previously bred *ignobilella* from one of the localities, and it is very curious that none turned up this year. The *Nepticulæ* that frequent hawthorn on limestone appear to be *pygmæella*, *oxyacanthella*, and *atri-collis*. Those on sandstone *pygmæella*, *oxyacanthella*, *gratiosella*, and *ignobilella*.

Species new to the Witherslack list.—I took a single specimen of *Retinia duplana* flying among fir trees this year; it is a very distinct species, and has only, I believe, been before taken in Scotland in very small numbers.

Depressaria hypericella has been bred this year from shoots of *Hypericum*, by both Mr. Shuttleworth and Mr. Murray. It had not previously been noticed in the district.

Some time ago Mr. Sang took a specimen of *Æcophora minutella*, and this year I was fortunate in doing the same. It was flying, near dusk, across a road near farm buildings.

In August I first found larvæ of *Asychna terminella* mining in the leaves of *Circæa lutetiana* in dark places in the woods.

In September, last year, I found and recognised mines of *Nepticula prunetorum* in sloe. I had before seen this larva but had stupidly mistaken it for *Nepticula plagicolella*. I now see that the latter is yellow and makes a clear whitish blotch preceded by a slender gallery: the former is green and its mine is coiled like a watch spring, afterwards extending round the edge of the leaf. The "frass" fills up the gallery and makes it light brown. The imago emerged very freely in June.

About August, I found mines, which appeared strange to me, in wild strawberry, these produced in June *Nepticula arcuosella*. The other mines found in wild strawberry produced *Nepticula aurella*, at least, I cannot separate the two insects at present.

Amongst alder bushes in a swamp, in August, I came upon reddish mines

tenanted by reddish larvæ, which were suspected to be *Nepticula alnetella*. In the latter part of June these emerged, *N. glutinosæ*.—I. H. THRELFALL, Preston: September 13th, 1882.

Habits and description of the larva of Chelaria conscriptella.—Whilst examining a birch tree in the latter part of last June for larvæ, which seem, upon the whole, to have been extremely scarce this year, my wife observed that the young leaves on one of the shoots were rolled up and partially eaten; and in the youngest leaf that was so attacked we found a small pinkish-brown larva, with a black head and second segment. On further examination, we detected several other shoots eaten in the same manner, the larvæ from which have produced *Chelaria conscriptella*.

The larva rolls up a leaf longitudinally and eats about half of it, sometimes also eating a little from a neighbouring leaf. It then proceeds to the next leaf nearer to the tip of the shoot, as if the leaf it had left had become too old and hard for its jaws, and treats it in the same manner. In some cases I have found it rolled up in one of the very small leaves only about a quarter developed, close to the very tip of the shoot. When full fed it spins a slight cocoon, and turns to a pupa of a light brown colour, and thickly covered with short hairs like the pile of velvet, except between the segments. The moths began to emerge on the 29th of July. I have also bred this species from bramble.

I append a description of the larva:

Length, $4\frac{1}{2}$ lines. Head black, rough like morocco leather, and shining; 2nd segment with a black plate above like the head, with slight indications of a pale dorsal line, and a small triangular black plate on each side. The general colour of the body is a brownish-pink, of which the shade varies considerably in different individuals. The pink predominates in the central portions of each segment on the back and upper parts of the sides; the portions between the segments and the under parts of the body have a light brownish tinge, with a very faint trace of the pink colour. The usual spots are small and black, and generally very inconspicuous. The hairs emitted by them have mostly a brownish tinge, those on the back being darker, sometimes quite black, and two at the anus, as well as a few on the sides of the front segments, are blackish with light-coloured rings. The legs are almost black, but the light ground-colour shows rather conspicuously between their segments; the claspers are of the light brown ground-colour, tinged with pink on the outsides, the rings of hooks at the feet being darker brown; the spiracles are inconspicuously edged with black.—NELSON M. RICHARDSON, Llangennech Park, R. S. O., Carmarthenshire: August 19th, 1882.

[The notice of the *habits* of this larva given above is extremely interesting. Madame Lienig's description (Isis, 1846, p. 292) says nothing of the habits; she gives the same food-plant, *birch*, but she describes the young larva as white, with hardly a tinge of greenish, and the more adult larva as dull whitish. It is not till some time before pupation that she says it is reddish-brown, with white incisions of the segments.

Since Madame Lienig's time no one seems to have met with the larva, but various food-plants have been assigned to it, from the imago frequenting certain

trees or bushes. If its occurrence on bramble should be confirmed, it would support the conjecture of von Nolcken that "probably the larva feeds on several kinds of leaf-trees."—H. T. S.]

Peronea perplexana and *Eupæcilia Mussehliana* in Carmarthenshire.—Amongst some insects which Mr. C. G. Barrett was kind enough to name for me lately, were specimens of *Peronea perplexana* (Ent. Mo. Mag., vol. xvii, p. 264) and *Eupæcilia Mussehliana* (Ent. Mo. Mag., vol. xv, p. 39). The former species I have taken in this neighbourhood several times in the last two or three years, but have not known exactly to what to refer it: this year I have bred it during the last week of July and the first week of August from larvæ spinning up the leaves of both mountain-ash and bramble. The imago occurs here occasionally in company with *P. comparana* and *Schalleriana*, and I have taken it generally by beating hedges of very mixed growth, such as sallow, hawthorn, oak, hornbeam, privet, birch, beech, bramble, &c., in the autumn.

Of *Eupæcilia Mussehliana* I have taken two specimens here this year amongst mixed herbage, so that I can form no opinion as to the food of the larva.—ID.: September 13th, 1882.

Hemiptera at Hurst Green, Sussex.—For three weeks in August, I had some collecting in the neighbourhood of Hurst Green, a small village in East Sussex, about 14 miles from Hastings. The following are the principal results:—

Sehirus biguttatus, in all stages, in moss at roots of *Calluna*. This is by far the commonest of the genus in East Sussex. *Stygnocoris rusticus*, common at roots of grass, &c.; *Dictyonota strichnocera*, rather common on furze; *Megalocera longicornis*, common on *Brachypodium sylvaticum*, the spikelets of which it so closely resembles that its detection is rendered difficult; *Leptopterna dolabrata*, ♀, developed; *Miridius quadrivirgatus*, a few by sweeping; *Hadrodema pinastri*, not uncommon on Scotch Firs; *Globiceps selectus*, by sweeping and at roots; *Dicyphus pallicornis*, on foxgloves; *Heterocordylus unicolor* and *Orthocephalus coriaceus*, by sweeping; *Macrocoleus molliculus*, common on *Achillea millefolium*; this is another species difficult to detect *in situ*, I found it on the under-side of the flowers, the involucre of which it closely simulates, the dark markings on the elytra corresponding to the scarious edges of the involucral bracts; *M. solitarius*, on *Stachys* by sweeping; *Amblytylus affinis*, by sweeping; *Atractotomus magnicornis*, not uncommon on Scotch and Spruce Firs; *Microphysa pselaphiformis* and *elegantula*, ♀, on trunks of various trees; *Acompocoris alpinus*, a few on Scotch Firs; *Ceratocombus coleoptratus*, in moss at roots of *Calluna*.

In Eridge Park, near Tunbridge Wells, I found *Chlamydatus caricis* on rushes, and at Frant *Salda Cocksii*, in *Sphagnum*.

Eupteryx vittatus.—Since writing the note on this species, which appeared on page 89 in the last No. of this Magazine, I have found the insect in the same stages on *Ranunculus repens* frequently, and occasionally on some other low plants.

Spiders and bugs.—Spiders of the family *Thomisidæ* appear to be partial to bugs as an article of diet. When searching at roots of plants, I have often come

upon them scuttling off with their prey in their falces, and not unfrequently they occur in the same way in the sweeping net, either having been surprised in the act and still unwilling to relinquish their chances of a dinner, or having taken advantage of the abundant supply of provision furnished in the heterogeneous contents of the net. One I remember to have seen bravely struggling with a refractory *Miris* larva, and another had a charming *Chlorita viridula* locked in its deadly embrace.—E. A. BUTLER, University Lower School, Hastings: September 11th, 1882.

Parasites on Homoptera.—Collectors of *Homoptera* must occasionally have observed black objects projecting from the bodies of these insects. As far as my experience goes, they are scarce, except on the *Typhlocybidæ*, but on some species of them they are common, each individual, however, having but one parasitic appendage. This is in the form of a long, sub-ovoid sac, very large in proportion to the size of the body of the foster-insect, protruding from between two of the segments of the abdomen, and tightly affixed at one end, otherwise free; the contour of the body being much distorted by the intruder, and it has been observed that the victims are always females. Curtis says of his *Aphrodes craticula* (= *Athysanus subfuscus*, Fall., sec. Puton): "It is infested in the different stages with a large black parasite attached to the sides of the thorax" (B. E., p. 633, 12), but I have not seen any parasites so located. I have often been asked if these apodal bodies were acaroid, but although I had made many enquiries I had not been able to obtain any satisfactory information as to their nature. Now, however, a light is thrown upon the subject by Herr Josef Mik, who, in one of the most interesting biological articles I have seen for a long time, published in the current number of the "Wiener entomologische Zeitung," page 215, demonstrates from actual experiment that one of this kind of parasite found on *Deltocephalus xanthoneurus*, Fieb., in September, became detached, fell to the ground, and produced in the next June a ♀ *Gonatopus pilosus*, Thoms. (Hymenopt. Proctotrupidæ). The details of the history (wanting some points as to the time and manner of deposition of the egg and the hibernation of the parasites under natural conditions) are fully given, together with descriptions and figures showing the *Gonatopus* in its various stages of life. We have thus a guide to investigations in this curious and hitherto obscure subject; what if all the species of *Gonatopus*, of which there are several in Britain, be parasitic on *Homoptera*?

It appears, by a foot-note, that *Gonatopus pedestris*, Dalm., was recorded in 1857, as having been reared by the late M. Edouard Perris from *Athysanus maritimus*, Perr. (Gen. *Thamnotettix*, sec. Puton), but this in no way detracts from Herr Mik's discovery, for the fact only became known to him subsequently.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 11th September, 1882.

Parasites on Homoptera.—I once found a parasite on *Iassus subfuscus*, and I have met with it again on *Acrocephalus agrestis*. This latter I kept for some time alive, and fed it on grasses, &c. The parasite at length burst open the black case, which appears to be the hardened skin of the larva, still attached to the host. It opened into two equal parts, and allowed the pupa to drop out, in which state it still remains, and I hope I shall be able to rear it to perfection. The host

had become completely exhausted by the time the parasite was full-fed, and died when the pupa dropped out.—EDWARD PARFITT, Exeter: *September 14th, 1882.*

Calyptonotus lynceus at the Camber Sandhills.—On August 7th, I took this local Hemipteron at the above locality, accompanied by *Rhyparochromus prateratus* and *Coranus* (1). A developed specimen of *Acalypta parvula* has been also found there.—EDW. P. COLLETT, St. Leonard's-on-Sea: *September, 1882.*

Ammæcius brevis at Matlock.—At the end of July, last, I found a single specimen of *Ammæcius brevis* in a sandy bank of the Derwent, at Matlock. I did not recognise it at the time, the resemblance of this beetle to an *Aphodius* having thrown me off the scent, or probably more specimens might have been secured.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: *September 18th, 1882.*

Chrysopa minima, Kiljander, = Ch. dasyptera, McLach.—In the "Meddelanden af Societas pro Fauna et Flora Fennica," Häftet 7, pp. 152—156 (1881), is a useful paper by Ludvig Kiljander, intituled, "Bidrag till kännedom om Finlands Neuroptera Planipennia," in which is a description of "*Chrysopa minima, nov. sp.*" (p. 154). A type and several other examples of this are before me in a case just received from Finland.

I find that the species is identical with that described by me in 1872 as *Ch. dasyptera*, from two examples, one from South Russia, the other from Samarcand. The description first appeared in the "Nachrichten der Liebhaber der Naturkunde, &c., in Moscow" (I refrain from giving the Russian title), x, p. 123, and almost simultaneously in the "Bulletin de la Soc. Imp. des Naturalistes de Moscou," xlv, p. 193; subsequently it was reproduced in the "*Neuroptera of Fedtschenko's Travels in Turkestan*" (1875), p. 19. One original type of *Ch. dasyptera* is in my collection, and it agrees perfectly with that of *Ch. minima*, save that (as is usual in *Chrysopa*) the green coloration has nearly disappeared, and I should scarcely now use the term "*viridi-flava*" that headed my original description, whereas an unqualified "*viridis*" would be more applicable to the recent examples from Finland. As I previously remarked, it is allied to *Ch. phyllochroma* (with which it agrees in its simple tarsal claws), but it can scarcely be a pigmy condition of that species. Possibly it is the smallest true *Chrysopa* that is known, but its broad-oval densely hairy (on the neururation and margins) wings render it conspicuous.—R. McLACHLAN, Lewisham: *4th September, 1882.*

P.S.—In the same paper (p. 153) Herr Kiljander remarks concerning *Myrmeleon formicarius*, L. (*formicalynx*, Burm.), "Förekommer i Skandinavien, England, och Österrike." The citation "England" is erroneous. No *Myrmeleon* occurs in the British Isles. Otherwise, the species in question is probably spread over the whole of Europe, and through Siberia to North China and Japan.—R. McL.

Garden-insects in 1882.—My out-door entomology this year having been restricted to the precincts of the garden, I can corroborate, so far as the experience within that area goes, the reports from the hunting grounds of the general dearth

of insects. In my case, the scarcity from the point of view gardenesque, (to use a term of the late J. C. Loudon), has been beneficial; but from the point entomological disadvantageous, as may be gathered from the following notes. These may also serve to show how an entomological biped has been temporarily affected by his environment (which is the latest, and not always appropriate, orthodox term to express conditions of life); but as to the conditioned hexapods, the contributory factors to their latest appearance, or non-appearance, must, in many cases, be sought in the fluctuating or conflicting agencies in more than one preceding generation, and then, perhaps, be found only hypothetically, on the assumption of *post hoc propter hoc*.

The early broods of *Pieris* had scarcely one representative; and in the late broods the numbers were far less than usual; consequently, the cabbages, which are ordinarily consumed by the larvæ, fairly escaped from the slight attacks of these enemies, and have taken heart. Not another butterfly of any kind has paid a flying visit.

Abraxas grossulariata, that in some years is the currant-pest, leaving not a leaf on the bushes, has not been visible in any form or condition this year.

Of *Orgyia antiqua*, that usually dances in and over the garden by dozens at a time, only a solitary one has now and then been seen practising its mazy figures.

Plusia gamma, that sometimes *will* be noticed, has this year had to be looked for, and I can just say that I have seen it.

Hepialus sylvinus, *Crambus pratellus*, and *C. tristellus*, that are usually common, and sacrifice themselves on the house-lights, have scarcely appeared.

Hyponomeuta padella began the season, as larvæ, well, and in some quantity, but I fear that my personal intervention with their way of life contributed, to a great extent, to rendering their course futile, and hindered the survival of the fittest.

Nematus ribesii, that is the usual rival or assistant of *Abraxas* in the devastation of the currant and gooseberry bushes, came not in the first instance, but later a few appeared and made their mark.

The white wool of *Schizoneura lanigera* profusely decorated the branches and shoots of all the apple-trees, save one that is never visited by this pest, up to the end of July; when, as if by a stroke of harlequin's wand, a transformation scene was effected: all disappeared and the foliage became revived and vigorous. From this recovery, however, one old tree was excepted: for three successive years it has struggled against the Aphidian foe, and has been reduced to a deplorable state of vital condition, and, now, almost leafless, it seems as if it would not survive, although for five or six weeks there have been no *Aphides* on it; its stem and branches are covered with the scales of *Mytilaspis pomorum*, which are so close together that they jostle each other for place. On this tree, in former years, I used to get *Gelechia nanella*, but I no longer find any examples nor see the pupa-skins sticking out of the bark. *Aphides* on other plants or trees have been scarce: the scanty glow of the pseudo-summer's sun on still evenings has not been peopled by floating swarms, nor has there been the agreeable spectacle of hundreds of these malefactors hung in the chains of the spiders, only tiny vagrant *Diptera* having been thus executed. The *Coccinellæ* might well have been starved if the *Aphides* on the hops had not come in thousands to their relief; thereon the lady-birds feasted to repletion.

No *Aleurodes* has yet been visible on cabbage, strawberry, honeysuckle, or other plants. I cultivated some plants of *Chelidonium majus*, on which *A. proleptella* is reputed to swarm, but without the good fortune to have enticed any of this desideratum to come into my garden.

A brood of *Capsus lanarius* took possession of a clump of raspberry-plants; in fact they were born and bred there, and mostly remained, but some of them acted the parts of pilgrim fathers and mothers, and went out not knowing whither, coming to grief, for their carcasses fell by the way. There were also a good many of *Scymnus minimus* on the raspberry plants.

Pilophorus perplexus, usually common, was this season a rarity.

Typhlocybidæ, of which in general some species, such as *T. rosæ* and *T. quercus*, swarm, have been very scarce.

In August, a *Thrips* devastated the flowers of Phloxes, and, in a less degree, of the *Convolvulus minor*: examples are reserved for Mr. Pergande. Strange to say, I have seen no other *Thysanoptera*.

Rhizotrogus solstitialis, that ordinarily dances in swarms around the tops of the trees on July evenings, came not then; in the middle of August, two or three of the belated creatures appeared on the scene and staggered through their performances alone.

Lucanus cervus kept not his annual appointment.

Sitones lineatus, that ordinarily comes in numbers before the sparrows dare to take the green peas for their booty, did not appear at all, although for several consecutive years peas have been grown on the same ground. Yet, these destroyers might as well have come and have had their share, for their abstention only left the more for the sparrows, which were still not content, but encroached on my proportion. The conditions of life of the said sparrows have certainly been favourable, for there are twice as many of them as there were a year ago.

Some casual visitors—pioneers or lost wanderers, I know not—called, and, having had their external communications cut off, were domiciled under glass. These were: *Derephysia foliacea*, usually a humble dweller, found ten feet up a cherry tree; *Myrmedonia limbata*, *Xestobium tessellatum*, and *Oxyomus porcatus*—one of each—alighted on the white stones under the verandah, attracted probably by the colour.

Of some regular *habitués* I have previously taken note at pages 67, 88, and 91; others I pass over.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: September 8th, 1882.

ENTOMOLOGICAL SOCIETY OF LONDON.—July 5th, 1882: H. T. STANTON, Esq. F.R.S., &c., President, in the Chair.

Herr Carl Berg, of the Museo Publico, Buenos-Ayres, was elected a Foreign Member.

Mons. Jules Lichtenstein exhibited, through Sir Sidney Saunders, specimens of *Cerataphis lataniae*, and communicated some remarks thereon, promising to forward further notes on a future occasion.

Miss Ormerod exhibited *Sitones puncticollis*, bred from larvæ taken off the roots of clover near Chelmsford; these larvæ began to change to the pupal condition about the 23rd of May, and one developed at the end of that month, six weeks after

the receipt of the larvæ. In the same locality where these larvæ were taken the pupæ were found in some numbers in June at the roots of the clover. Miss Ormerod remarked that the larvæ were particularly sensitive to damp.

Mr. E. A. Fitch exhibited two ichneumons parasitic on spiders, and read a note from the Rev. T. A. Marshall respecting the first, pointing out that the spider on which the larva was parasitic was a species of a bright green colour, and that the larva that fed upon it gradually turned green itself. Mr. Fitch thought the second species was probably a *Polysphincta*, and he read a communication from Mr. Bignell respecting its larva, and showed a figure of it. He also remarked that De Geer had noticed a larva that was parasitic on a spider. He also exhibited a new species of *Proctotrupidæ* from the Rev. T. A. Marshall, taken in Rothen Wood in company with *Anommatus 12-striatus*, four to six feet under ground.

Miss Ormerod showed specimens of very young pine trees, whose stems had been stripped of their lower leaves by chafer-grubs, and remarked that she had often heard that the pines were damaged in this way in Canada, but that this was the first case in England that had come under her notice.

Mr. C. O. Waterhouse exhibited a species of *Ephemeridæ* from Ceylon, on behalf of Mr. G. Lewis, who said it was luminous. The Rev. A. E. Eaton stated that it was a species of *Teloganodes* (probably *T. tristis*, Hag.); and that there was a remark in the Transactions, by Dr. Hagen, concerning a British species of *Cænis*, which was said to be faintly luminous. According to Mr. Lewis, the whole abdomen in his insect appeared to be luminous.

Mr. Miskin communicated a paper on the habits of *Ogyris Genoveva*, Hewits.

Lord Walsingham sent a paper on North American *Coleophoræ*.

Mr. Scott communicated a paper on certain genera and species of *Psyllidæ* in the British Museum.

August 2nd, 1882: F. D. GODMAN, Esq., F.R.S., Vice-President, in the Chair.

Mr. Hildebrand Ramsden, of 26, Upper Bedford Place, W.C., was elected a Member of the Society.

Mr. F. Enock exhibited male and female specimens of *Macropis labiata*, which he had captured at Woking.

Mr. Billups exhibited specimens of *Paragus tibialis*, Fallen, which he had found in June last in the burrows of *Halictus nitidiusculus*, and also a specimen of *Discomyza incurva*, Fallen, captured at Box Hill; this insect was unrecorded as British.

Miss E. A. Ormerod read some Observations on the development of *Sitones lineatus*.

Mr. Distant exhibited a number of specimens of *Xyleborus Saxeseni*, Ratz., a species which had occasioned the destruction of beer sent out to Rangoon, presumably by boring through the casks.

Mr. Olliff exhibited specimens of *Anommatus 12-striatus*, Müll., captured at Tunbridge by Mr. A. C. Horner.

Mr. G. Lewis contributed a paper entitled—On a visit to Ceylon, and the relation of Ceylonese beetles to the vegetation there.

Mr. H. Pryer communicated a short memoir—On certain temperature-forms of Japanese butterflies.

Mr. C. O. Waterhouse read—Descriptions of new *Coleoptera* from Madagascar belonging to the *Melolonthidæ*.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

Since the Entomologist's Annual ceased to be published in 1874, no collected notice, with descriptions, of the species of *Coleoptera* that have been added to the British list has appeared; the species, too, that were described in the "Annual," after the publication of Dr. Sharp's catalogue in 1871, have, in many cases, escaped the notice of collectors, who have used the catalogue for labelling their cabinets: it is hoped, therefore, that these notes may be of interest to the many new collectors who are taking up the study of *Coleoptera*. I have had a great part of them written out for a considerable time, and have found them of the greatest use for private reference; they have been perused by several well-known Entomologists, to whom I am much indebted for alterations and suggestions, and I feel very great pleasure in publishing them in a revised form. I have adopted the classification of Dr. Sharp's catalogue, which is in the hands of most collectors; this catalogue is, however, now out of print, and a new list is much required. Dr. Sharp has been, and still is, so much occupied with foreign groups, that he is unable to give the requisite time for bringing out another edition. The Rev. A. Matthews and myself have been, for some time past, engaged upon a fresh catalogue, which we hope soon to publish; considerable alteration in classification will, in parts, have to be made, to bring the work at all up to a level with the results of modern research, but, by adopting, with but few exceptions, the old nomenclature, which has been so unreasonably upset in the last edition of the European catalogue, and by avoiding unnecessary changes, we hope to avert confusion as much as possible.

In the ensuing notes references to authorities are given wherever it is possible; as, however, they are not intended to be in every case conclusive, but merely as notes and hints to collectors, additions and changes that have, by common consent, come to be considered necessary, have been mentioned, in the hope that in any doubtful case some person may be induced to prove or disprove the statement.

GEODEPHAGA.

Notiophilus 4-punctatus, Dejean.

It is doubtful whether this species should be retained as distinct, or be merely considered a variety of *N. biguttatus*, Fab.; as Crotch first pointed out, it is some-

times *biguttatus* on one side, and 4-*punctatus* on the other, which appears conclusive. Dawson (Geod. Brit., p. 57) says, that it is probably only an uncommon variety of *N. semipunctatus*, Fab., of which he makes *N. biguttatus* a variety. I have specimens from the south of England which show no structural difference from *N. biguttatus* worth mentioning; the striæ, however, on the forehead appear to be more numerous and finer than in this latter species.

Carabus auratus, L.

The specimens of this insect that from time to time are captured in this country, seem to be always taken in situations or localities that make it almost certain they have either flown across the channel, or been imported with vegetables, &c.

CARABUS CANCELLATUS, Ill.

This species has been alternately inserted in and omitted from the list. Dr. Power tells me that there are certainly two or three well authenticated specimens, and that he thinks one has been taken within the last two or three years; among some notes from Mr. Mason relating to Mr. Rye's collection, I find this insect mentioned as one that ought to be re-instated.

Carabus convexus, Fab.

The only specimen of this insect that seems to have any good claims to authenticity is in the collection of the Rev. A. Matthews, and this rests on rather circumstantial evidence.

Calosoma sycophanta, L.

This species is almost certainly not indigenous; it is only an occasional visitant from the continent.

Dyschirius obscurus, Gyll.

I have never seen this species. Dr. Power says that he believes it rests on one specimen, which he always thought was a varying specimen of some other species, and he advises its omission from the list. Dawson (Geod. Brit., p. 29) says, that M. Putzeys had informed him that M. Reiche had a specimen which was captured in England, and that Mr. Haliday had told him he had captured it on the shores of Lough Neagh. In Ent. Ann., 1858, 51, he alters his description, as given in the Geodephaga Britannica, saying, that he was now able to describe it from actual types before him; he does not, however, say whether these types were British or foreign examples.

Brachinus explodens, Duft.

This appears to be a doubtful species; the whole question will be found discussed at length Ent. Ann., 1866, 58.

DROMIUS VECTENSIS, Rye.

This species is closely allied to *D. sigma*, Rossi, but is distinguished by its shorter and stouter antennæ, wider head, and more transverse thorax, and wider and comparatively shorter elytra; the shape of the fasciæ on the elytra also serves to distinguish it. It frequents the sea coast, especially in the Isle of Wight, whereas *D. sigma* is a fen insect (Ent. Mo. Mag., x, 73; Ent. Ann., 74, 76).

Dromius oblitus, Boield.

This species is synonymous with *D. nigriventris*, Thoms. (*D. fasciatus*, Dej.), but the *D. oblitus* of Dr. Sharp's catalogue must be referred to *D. vectensis*, and must, therefore, be erased from the British List, the latter name being substituted.

Lebia turcica, Fab.

There appears to be no really authentic example of this species extant as British; it is better, therefore, to omit it from the list.

Lebia hæmorrhoidalis, Fab.

This species is said to have been once taken by Mr. Hope near Netley, Shropshire. Dr. Power possesses a specimen, concerning which he writes as follows: "My specimen was taken in a field at Devizes, and set by Mr. Sidebotham himself. I have an accurate description of the spot, and do not feel any doubt as to accuracy; it is an out-of-the-way place, and there is no reason to think it accidentally imported, as would be the case at the Crystal Palace or its neighbourhood. If you strike it out, I shall say you are wrong."

Amara fusca, Dej.

Our examples of this species must be referred to *A. ingenua*, Duft. The species, therefore, must be omitted.

AMARA CONTINUA, Thoms.

This species has been separated by Thomson from *A. communis* as new. It comes between *A. lunicollis* and *A. communis*, having the build of the former insect, and also (like *lunicollis*) having the marginal row of punctures on the elytra continuous. It has, however, three joints at the base of the antennæ testaceous, whereas *A. lunicollis* has but two. In *A. communis* the marginal row of large punctures is interrupted (Ent. Mo. Mag., xi, 207).

SCYBALICUS OBLONGIUSCULUS, Dej.

This insect, for which Schaum made the genus *Apatelus*, and which now, with one other species, forms his genus *Scybalicus*, has also been classed with the true *Harpali*. It certainly comes very near the *Ophonus* section of the genus *Harpalus*, and forms a good transition from them to *Harpalus ruficornis* and the allied species; it is about the size of *H. ruficornis*, to which its striking yellowish pubescence gives it, at first sight, a superficial resemblance; this pubescence, together with the shape of the thorax (which is much constricted behind, with the posterior angles very obtuse and almost rounded, and the base nearly straight), will serve to distinguish it. This great addition to our list was discovered by Mr. Harris, of Burton-on-Trent, in 1878, who took one example near Weymouth. Mr. Mason took several specimens in 1879. Mr. J. J. Walker took one immature example about the same time; and it has quite lately been found by the Rev. O. Pickard-Cambridge (Ent. Mo. Mag., xv, 203; Entomologist, xv, 238).

Harpalus obscurus, Fab.

This insect has been a great source of confusion to British Entomologists, in great measure owing to the fact that the *Harpalus obscurus* of Dawson's Geod.

Brit. is really the common *Harpalus rotundicollis*, Fair. Fabricius's *Harpalus obscurus* comes very near *Harpalus sabulicola*, Panz., and is the same as the *Ophonus stictus* of Stephens. Dr. Power tells me that when the name *rotundicollis* was substituted for *obscurus* by Mr. Crotch and others, the name *obscurus* was still retained for an insect which was only obtained by himself and others near Swaffham (Cambridge); it was, he says, a very distinct thing, but it was evidently nearer *H. sabulicola* than *H. rotundicollis*, as both he and Professor Babington distributed it as the former species.

HARPALUS DIFFINIS, Dej.

This insect appears very closely related to *H. rotundicollis*, Fairm.; the latter insect is only distinguished by having the sides of the thorax more strongly rounded and the apex of the elytra more distinctly sinuate (Insecten Deutschlands, i, 574). *H. diffinis* is certainly found in England; it is a question, however, whether it is really a distinct species; still, it seems to be considered distinct on the continent, and can hardly be omitted from our list.

Harpalus cordatus, Duft., *H. rupicola*, Sturm., *H. puncticollis*, Payk., *H. rufibarbis*, Fab. (*cribellum*, Daws.), *H. parallelus*, Dej.

These species of *Harpalus* require a careful revision: in Mr. Rye's collection there is a distinct species, apparently near *H. cordatus*. *H. parallelus* appears to be a doubtful species, and to be at best a variety. The two species that precede it seem occasionally to be hard to distinguish. I have, however, taken a large number (over 100) of *Harpalus rufibarbis* in one spot, and found the shape of the thorax very constant.

HARPALUS GRISEUS, Panz.

This species, which is considered by Dr. Sharp to be merely a variety of *H. ruficornis*, appears to be generally regarded as distinct on the continent; it is described by Dr. Schaum (Insecten Deutschlands, i, 584) as very near *H. ruficornis*, but considerably smaller. The thorax is only punctured at the base, the hind angles are, as in *H. ruficornis*, nearly right angles, but not so sharp as in that species. The elytra are scarcely sinuate at the apex, whereas, in *H. ruficornis*, they are distinctly sinuate. If these differences are constant, the form would certainly have specific value. I have, however, a specimen from the New Forest which, at first sight, looks very different to *H. ruficornis*, chiefly owing to size, but, on closer examination, it is extremely hard to make out the distinctions.

Harpalus sulphuripes, Germ.

The British exponents of this species appear to belong to other allied species; it must, therefore, be erased from the list.

Harpalus luteicornis, Duft.

The same remarks apply to this species as to the preceding. Mr. E. Saunders possesses examples of both species (named by authorities), but he tells me that he feels sure that they need not be regarded as having specific value. The claims of this species to be indigenous have been quite demolished by Mr. Rye. Ent. Mo. Mag., x, 229.

Harpalus latus, var. METALLESCENS, Rye.

This curious variety of *H. latus*, with metallic instead of black elytra, was discovered and introduced by Mr. Rye (Ent. Mo. Mag., xi, 84).

Harpalus 4-PUNCTATUS, Dej.

This insect is very like *H. latus*, but larger and more parallel, with bluish reflection; the thorax, too, is not furnished with the testaceous edge so evident in *H. latus*; on the apical half of the third interstice of each elytron are two or three large punctures. Taken at Braemar by Mr. Blackburn and Mr. Champion, and by several collectors since; it has also occurred in Ireland (Ent. Ann., 1874, 78; Ent. Mo. Mag., x, 68).

Acupalpus derelictus, Daws.

There has been a great deal of discussion over this insect, which has been regarded as merely a dark variety of *A. dorsalis*; it would, however, seem that the unique example taken by Mr. F. Smith near London, from which Mr. Dawson described the insect, is quite distinct, but that dark specimens of *A. dorsalis* have passed for the species in collections (Ent. Ann., 1860, 125; 1866, 61).

Acupalpus brunnipes, Sturm.

It seems doubtful whether Sturm's insect is a distinct species from *A. dorsalis* (Ent. Ann., 1866, 47).

Tachys quadrisignatus. Duft.

This appears to be rather a doubtful species, as it rests on a single example taken by Mr. Bold near Newcastle, which may probably turn out to be only a light variety of *T. bistriatus*, Duft. (Ent. Ann., 1866, 61; Ent. Mo. Mag., xix, 68).

Bembidium lampros, v. *velox*, Er.

This variety has been made into a new species by Thomson, under the name of *B. 14-striatum*; each elytron has seven striæ instead of six like the normal form; there are, too, a few other slight differences, but, on the whole, it would appear best to leave it still as a variety (Ent. Ann., 1874, 80).

HYDRADEPHAGA.

Haliphus varius, Nicolai.

This insect cannot possibly be retained as a separate species; it seems, however, doubtful whether it is to be considered as a variety of *H. confinis*, Steph. (*H. lineatus*, Aubé), or whether it is to be considered a variety of *H. obliquus*, Fab. I do not possess the insect, but have seen it in Dr. Power's collection, and certainly thought that it looked extremely like a light variety of *H. obliquus*. Erichson and Aubé considered it a variety of this species. There is, moreover, a doubt whether Mr. Bold's insects, on which the species was introduced into our lists, are really referable to *Haliphus varius*, Nicolai (Ent. Ann., 1869, 14; Ent. Mo. Mag., iv, 284).

Hydroporus incognitus, Sharp.

It is a question whether this is synonymous with *H. ragepictus*, Fairm.; it

comes very near *H. palustris*, of which species it has been considered a variety, but its larger form, and far less parallel elytra, which are considerably widened behind the middle, must give it rank as a separate species.

ILYBIUS *ÆNESCENS*, Thoms.

This species must be introduced into the British list, but whether it is to stand as separate, or whether all our specimens of *I. angustior*, Gyll., are to be referred to it, seems open to question. The two species are very closely allied, but *I. ænescens* is rather smaller, with less metallic reflections, and has its antennæ uniformly ferruginous instead of pitehy at the apex; my representatives of the two species are certainly identical, and answer the description of *I. ænescens* (Ent. Ann., 1873, 22; Ent. Mo. Mag., ix, 36).

Gyrinus caspius, Men.

This seems to be a very doubtful species, and it would seem that there is very little difference between *G. opacus*, Sahl., and *G. marinus*, Gyll., as species.

(To be continued).

NATURAL HISTORY OF *PIONEA STRAMENTALIS*.

BY WILLIAM BUCKLER.

In the first part of a "Calendrier du Micro-Lépidoptériste," by M. Camille Jourdheuille, published in the volume for 1869 of the "Annales de la Société Entomologique de France," at p. 540, under the heading for March we read—"Botys stramentalis, Hb. Dans les tiges de blé: quelquefois tres nuisible." This has been cited by Dr. E. Hofmann in his "Kleinschmetterlingsraupen," and also more recently by Mons. E. L. Ragonot, in Vol. xvi, p. 154 of this Magazine, where he tells us, "It has been stated that the larva feeds in March, in stems of wheat, and that it is sometimes injurious to crops."

Now, in what follows, I think I shall be able to dispose effectually of the foregoing misconception of *stramentalis*, by showing that the larva is not at all an internal feeder, or to be found in March, and is quite innocent of attacking any cereal crop.

On the 27th of July, 1881, I had the pleasure to receive from Mr. Wm. R. Jeffrey a numerous batch of eggs laid by some female moths of this species he and his son had captured, and imprisoned with a variety of leaves of plants that grew where the insects were flying.

The eggs were first observed on the 24th of the month, to be laid on leaves of *Lotus major*, *Glechoma hederacea*, *Barbarea vulgaris* and seed pod, *Myosotis cæspitosa* and *Phalaris arundinacea*, scattered in little flat masses; the largest number in any mass amounted to thirteen,

others ranged from three to five, six, seven, and eight, overlapping each other after the manner of *pandalis*, and like them presented a smooth and greasy appearance.

It was some time before I could detect on the *Glechoma* a mass of eggs of precisely the same colour as the under-side of the leaf where they adhered, and only when the mass presently in a slight degree began to swell above the surrounding surface could I feel sure it was composed of eggs, so perfect was the assimilation.

In the interval while the eggs were maturing, Mr. Jeffrey and I exchanged ideas with regard to the probable food-plant, so as to be provided in readiness for the young larvæ, and I found we were both in accord in having fixed on the cruciferous plant as the most likely among those above mentioned, to have induced the parent insects to have parted with their eggs so freely, as they had, both on it and the other leaves, probably from knowing the right food was present which their progeny would unerringly find; and we had good ground for assuming this to be the case, as we remembered the fact that our only two other British species of *Pionea*, viz.: *forficalis* and *margaritalis*, both feed on *Cruciferae*.

Accordingly, when the eggs hatched on 2nd, 3rd, and 4th of August, we were both prepared with *Barbarea vulgaris* for the young larvæ, whose liking for it became soon unmistakeably apparent, for though the other kinds of leaves were at first put with it, yet each little larva in turn found its way from them to the *Barbarea*, and crept down the upper-side of the leaf to near the stalk and there rested, and in course of an hour or two there became a numerous assemblage of the little creatures lying in rows side by side most contentedly, and where they afterwards began to feed, and to spread themselves in small companies over the surface, but showed no disposition to wander away from the leaf: thus they continued all through their subsequent stages, unto the very end of their career, to be of exceptionably amiable disposition, never interfering with one another when, as often happened, some would be laid up to moult while their companions were still by their side feeding, in such a sociable manner as to suggest the probability of their being in nature more or less gregarious.

Very soon I experimented with six individuals by placing them on leaves of *Sinapis arvensis*, and they contentedly throve on this food as long as it could be supplied, but after a time these plants seeded so rapidly that good leaves were difficult to obtain, and as they would not eat the seed pods of this or the other plant but only the leaves, I eventually, after they had moulted, returned them to their former

companions on the *Barbarea*: Mr. Jeffrey had also varied the food of some of his larvæ, by giving them *Cardamine amara*, and he found they took to it freely; the result of these experiments tended to the belief that though the *Barbarea* is at least one of their natural food-plants, yet that there are other plants liked by them quite as well to be found amongst the tribe of *Cruciferae*.

The larvæ moulted thrice, first from the 8th to 10th of August, a few rather later, the second moult happened with most of them on the 17th and 18th, and the third moult occurred with some on the 24th, and all had safely accomplished that operation by the 27th of the month.

By the 9th of September, all were full-fed and shut up in cocoons of earth, more or less in small companies partly clustered together, many attached to the leaves lying on the surface of the ground, in which none had gone to any great depth.

The perfect insects were bred, the first by Mr. Jeffrey, as early as June 29th, 1882, followed by a very great number in his cages, where they continued to appear at intervals, often three or four together, and occasionally six at a time, up to the 27th of July,—though with me the first appeared on July 14th, and then my anxiety was dispelled by a feeling of great satisfaction at the completion of data for this history.

The egg of *stramentalis* is ovate in shape, very flat at first, but swells gradually, and in about six days appears to be finely reticulated on the surface, and is then glistening and of a brownish-ochreous yellow colour, transparent enough to show through the shell the greenish embryo coiled round within, and surrounded with yellow granules; on the seventh day it is more filled out and rather prominent, and then becomes a little dingier in tint, and hatches on the day following.

The newly-hatched larva is green, and rather transparent, with a flattened black shining head and dark brown neck-plate, and on the body can just be discerned most minute black dots and hairs; after eating out little pits and channels from the cuticle, causing transparent blotches on the leaf for about five or six days and acquiring more colour, it becomes of a very pale watery-green as it lays up to moult.

After the first moult it eats holes quite through the leaf, and its ravages are very perceptible; its head is black, the back dark green, the belly pale watery-green, the sides of the shining neck-plate dark brown, while the middle of the plate is of the same green colour as that of the back, the wart-like spots are of the ground colour but have dark brown centres bearing single hairs, and a pale ring is at the base of each spot.

Soon after the second moult it is very dark on the back with a deep and subdued blackish olive-green colour, while the belly has a much lighter tint of the same, these are separated by a spiracular stripe of bright yellow, the head, the side margins of the neck-plate, and the warty spots on the upper surface are shining black, on each side of the back are two very fine and much interrupted series of white linear dots, less broken on the second segment to the end of the fourth than on the others, the warty spots on the ventral surface are of the ground-colour, having dark olive-brown centres.

Directly after the third moult and for a day or so the ground-colour of the larva appears perfectly black, which enhances the brilliancy of the broken white lines and the yellow spiracular stripes, but by degrees, after it settles down to feed again and grow, the black skin expands and the ground-colour of the back becomes more and more green until it is again of a blackish olivaceous-green, when the length ranges from 13 to 16 mm.

It now consumes a great quantity of food and the plump skin begins to shine a little; at the end of about ten days it attains full-growth, of an average length of 21 mm., and is thick in proportion, tapering a little at each end, the anal legs extended behind in a line with the body; the glossy black head has the upper lip light green, edged at the mouth with black, the papillæ colourless, the side margins of the plate on the second segment and the warty tubercles each with a hair are black and glossy, the upper series of broken linear white dots commence rather wide apart on the front margin of the second segment, and in their course down the back form a base to the upper-side of each first pair of tubercles, the lower series commence on the third segment and are still more interrupted, the spiracular stripe of very bright and deep yellow begins on the second segment and extends to the thirteenth, another narrower stripe begins on the fifth and follows almost close below, of either pale primrose-yellow or whitish, the circular spiracles are yellowish-brown with shining black centres, the belly is of a dingy drab-green, less dark than the back, the anterior legs are greenish, the ventral and anal legs almost colourless: after the ten days' feeding and while still eating at intervals it gradually contracts its length, and the dark back assumes a bright purplish-violet coloured ground more shining than before, when it is very beautiful, but in two more days' time it ceases to eat, and then the spiracular yellow stripes lose their brilliancy, while it lingers a few hours before spinning its cocoon on or just below the earth, wherein

it remains in the larval state and retains the purple-violet colour until spring of the year following, when it changes to a pupa.

The broad-oval cocoon is covered with particles of earth, and measures from 16 to 19 mm. in length and from 10 to 12 in breadth, the interior being very smoothly lined with pale drab-coloured silk; the pupa is of rather a dumpy figure, from 8 to 9 mm. long, the wing-covers longish, of a light yellowish-brown colour marked with dark brown and having the nervures in high relief, the eye-pieces and abdomen dark brown, the surface smooth and glossy, the last segment of the abdomen is a little prolonged and rounded off at the tip without any points of attachment, which probably would be in this instance superfluous, as the tail of the pupa is brought to rest closely packed against the side of the cast off larval skin, bristling with stiff hairs, which evidently afford sufficient support and resistance for the escape of the insect.

Emsworth: *September 11th*, 1882.

A NEW EUROPEAN *PANORPA*.

BY R. McLACHLAN, F.R.S., &c.

For some years I have had in my collection one ♂ *Panorpa*, taken by Baron von Nolcken in the island of Oesel, in the Baltic, that appeared to represent an undescribed species, in some respects intermediate between *P. communis* and *P. germanica*, but nearer the latter. Afterwards I saw a ♀ captured in Saxony by Herr Rostock, apparently of the same species. Quite recently a second ♂, from Finland, captured by Herr Appelberg, has come under my notice. As the MS. name under which I returned the Saxon specimen has recently found its way into print ("*P. hybrida*, McLach.," cf. Rostock in "Entomologische Nachrichten," vii, p. 224), it is desirable to describe the species.

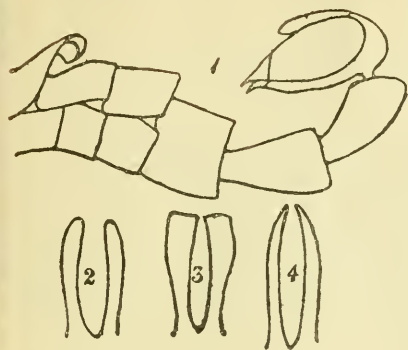
PANORPA HYBRIDA, n. sp.

♂. Head black above, yellowish posteriorly; rostrum yellowish or testaceous, with two longitudinal blackish or piecous streaks scarcely extending to the apex; palpi testaceous, terminal joint fuscous; antennæ fuscous, the basal joint yellow.

Thorax black above: pronotum yellow on its posterior margin; meso- and meta-nota with a yellow central line and yellow scutellum. Sides wholly yellow or testaceous.

Legs testaceous; terminal joint of tarsi fuscous; claws testaceous, with three teeth internally below the apex.

Abdomen blackish to end of 6th segment, with testaceous lateral longitudinal



lines; third dorsal segment narrowly testaceous on its posterior margin, which, in its middle, is produced into a very large, rounded, testaceous hump clothed with black hairs, and extending over a portion of the succeeding segment, in a cavity in which it fits; 7th to 9th segments wholly testaceous, formed as in *P. germanica*; appendages of the 9th (the cheliferous) segment elongate, band-shaped, not much dilated to the tips, which are regularly rounded (not truncate), the colour testaceous, with blackish hairs, which

are more numerous at the tips.

Wings broad, broadly-elliptical at the apex, vitreous with fuscous neuration; pterostigma pale yellowish. Marking apparently variable. In the ♂ from Finland the only markings are short fuscous transverse spots on the anterior margin (whereof two on the pterostigma are the most prominent), some apical spots, and a slight clouding on some of the transverse nervules. In the ♂ from Esel there is an abbreviated maculose transverse fascia towards the base, succeeded by a median elongate costal spot, which is followed by a sub-apical, angulose, narrow, complete fascia; there are also apical spots and some clouding of the nervules. (The ♀ is not now before me; according to memory the dark fasciæ were more distinct, and the apex had a band broken up by pale spots, which were enclosed in it).

Expanse, ♂, 29—31 mm.; ♀, 34 mm.

Island of Esel (*Nolcken*, 1 ♂); Finland (Carelia, *Appelberg*, 1 ♂, in the Helsingfors Museum); Saxony (Dretschen, *Rostock*, 1 ♀).

Equal to large typical specimens of *P. communis* (excluding *P. vulgaris*, Imh.) in size, but structurally allied to *P. germanica*, with which it agrees in the comparative length of the four modified terminal segments, and also, to some extent, in the nature of the wing-markings. It differs especially from *germanica* in the more produced hump on the posterior margin of the third dorsal segment, and in the form of the appendages on the cheliferous segment, which, in *germanica*, are shorter, more flattened, and with the apex truncate and more dilated. This latter character is conclusive (and there are also differences in the parts underlying these appendages, but not easily definable without dissection). The same characters will separate it from the South European *P. gibberosa*, but in this latter, the hump on the third dorsal segment approaches that seen in *hybrida*.

It is possible that *P. hybrida* is peculiar to Northern Europe, and

no doubt it has been hitherto generally overlooked, or considered as only a large form of *P. germanica*.

Fig. 1 represents the greater portion of the abdomen of *P. hybrida*, ♂, from side; fig. 2, appendages of the cheliferous segment of *P. hybrida*; fig. 3, same of *P. germanica*; fig. 4, same of *P. communis*.

N.B.—I wish it were as easy to define any structural differences between the large typical form of *P. communis* and the (usually) smaller, more marked form known as *P. vulgaris*, Imhoff (= *var. diffinis*, McLach., olim.). I still incline to consider them distinct; but in a series of nearly 100 examples before me, there are several that might apparently be placed in either *communis* or *vulgaris*, as defined only by size and markings.

Lewisham, London:

15th September, 1882.

P.S.—In my paper on the species of *Panorpa* occurring in Europe, in the Trans. Ent. Soc. Lond., 1869, I identified with *P. picta*, Hag., a ♀ specimen from South Russia, which is figured on pl. iv, fig. 11. Having since received many examples of the true *picta* from Asia Minor and Persia, I am now by no means certain that the South Russian insect is specifically identical, and it may be well to retain for it the name *nigrirostris*, under which it was received from Zeller. In the true *picta* the wings are in no way tinged with yellow, and the black bands and markings are broader and more distinct. Perhaps a smaller ♀ from Transcaucasia is identical with *nigrirostris*.—R. McL.

NOTES ON TENTHREDINIDÆ.

BY P. CAMERON.

(Continued from Vol. xviii, page 67).

Tenthredo coxalis, Smith, Journ. Linn. Soc. Zool., ii, p. 116, As there is nothing in the description of this species to show that it is not a true *Tenthredo*, I may state that it is a *Strongylogaster*, with pilose antennæ and truncated clypeus. The type I examined in the Hope Museum, Oxford.

Ancyloneura, Cameron, Trans. Ent. Soc., 1877, p. 91, = ♀ of *Cladomacra*, Smith, Ann. Nat. Hist. (3), vi, p. 256.

Lophyrus tropicus, Norton, and *L. cordoviensis*, Norton, belong to

the genus *Brachytoma* of Westwood. The genera belonging to the sub-family to which these species belong may be briefly characterized as follows:*

A. Antennæ 10- 11-jointed, labial palpi 1-jointed, maxillary 3-jointed...

Decameria, Lep.

B. Antennæ with more than 11 joints.

1. The antennæ with more than 13 joints, flabellate in the ♂, maxillary palpi 4-, labial 3-jointed; 2nd cubital cellule usually receiving both recurrent nervures, appendicular cellule in hind wings very small...

Type, *L. tropicus*, Norton.

Lophyroides, g. n.

2. The antennæ 13-jointed, maxillary palpi 2-, labial 1-jointed; 2nd cubital cellule usually receiving only one recurrent nervure, appendicular cellule in hind wings large *Perreyia*, Brullé.

The genus *Camptoprium*, Spinola, is no doubt identical with *Decameria*; but Spinola describes the palpi as long filiform and 6- and 4-jointed. I suspect, however, that this statement is erroneous.

Perreyia (?) *anomala*, Kirby, List of Hym., i, p. 90, pl. vi, fig. 14, is evidently identical with *Lophyroides tropicus*, Norton. What Mr. Kirby (*l. c.* pl. vi) figures as the ♂ of *Perreyia compta*, Norton, is, so far as I can make out from the figure, identical with a species I have described in the "Biologia Centrali-Americana" under the name of *Lophyroides ruficollis*. As Mr. Kirby appears (*l. c.* p. 90) to doubt if Norton had really males of *P. compta*, I may mention that all his specimens were males. I have examined them through the kindness of Dr. Henri de Saussure.

Cephalocera (?) *calcar*, Norton, Trans. Amer. Ent. Soc., i, p. 51, belongs to the genus *Loboceras*, Kirby.

Nematus betularius, Htg., Blattw., 192, 17, = *erythrogaster*, Thoms., nec Norton. Before I was aware of the identity of *erythrogaster* with *betularius*, I named it *crassiventris* (Ent. Mo. Mag., xiv, 267), and Mr. Kirby (List of Hymen., i, p. 132) has named it *luteogaster*.

Nematus conjugatus, Dbm., S. E. Z., 1848, p. 177; Thoms., Opus. Ent., 623, 19. This species is British; I have found the larvæ in Clydesdale.

Nematus consobrinus, Voll., Tijds. Ent., xvi, p. 236, pl. x (1871), = *N. umbrinus*, Br. & Zad., Schr. Ges. König., xvi, p. 84 (1876). The late Prof. Zaddach confirmed this determination a short time before his death.

Nematus varius, André, Species d. Hymen., i, 193, = *N. pallescens*, Htg., Cameron, Fauna of Scot., Hymen., pt. 1, p. 40.

* They will be more fully described in the "Biologia Centrali-Americana."—P. C.

Nematus monticola, Thoms., Hymen. Scand., i, 147, 77. I have taken this seemingly rare species in Clydesdale.

Nematus Marshalli, Cam., Ent. Mo. Mag., xii, p. 9. This species is most closely related to *N. myosotides*, Fab., but may be known from that common species by its body being shorter, and broader compared to its length, the antennæ are distinctly longer than the body, the abdomen is not much longer than the head and thorax and only black at the base, and the wings are much darker coloured.

Here is a puzzle for those interested in antiquarian Entomology. According to Thomson, *pappilosus*, Retz., is identical with *N. myosotides*, Fab., but that determination cannot be correct, for the latter feeds on clover, while *pappilosus* is a willow feeder of totally different habits and coloration. The description of the larva agrees very well with *N. pavidus*, Lep., *sec. Zad.*, but I cannot make the description of the imago fit very well with the latter, unless it is the ♂ that De Geer describes.

Nematus bellus, Br. & Zad., *l. c.*, pl. 6, fig. 13 (1876); André, Species d. Hymen., i, p. 155 (1880), = *N. baccarum*, Cam., Ent. Mo. Mag., xi, p. 189, January, 1876. Brischke and Zaddach only figured the larva and gall, and I was only made aware of the identity of the two when I received types this year from Herr Brischke. The imago was first described by André *l. c.*

I have, during the last year or two, been re-investigating the gall-making *Nemati*, and have come to the conclusion that there are only three good species which form round berry-shaped galls on willows, namely, *viminalis*, Lin., *sec. Vollenhoven*; *baccarum*, Cam., = *bellus*, Br. & Zad.; and *herbaceæ*, Cam. This determination only refers to the species of which the habits are known; for it is quite possible that some of the species described by Thomson, and whose habits are still unknown, may also form round galls on willows.

It is very much to be wished that the Revision so well commenced by Brischke and Zaddach of the Palearctic *Nemati* would be completed; but a revision, to be of any real value, would require to be based on collections from different parts of Europe, and especially on type specimens. These insects are so closely allied, that determinations made from many of the descriptions are pretty much guess work. Förster's species especially, notwithstanding the length of his descriptions, are very difficult to make out; and as most of them are founded on males alone, cannot be identified without an examination of his types.

Dolerus Chappelli, Cam. Mr. Kirby (List of Hymen., i, 219) sinks this name in favour of *geniculatus*, Lep., Mon., 122, 364. This, however, appears to me to be an exceedingly doubtful determination. To begin with, *geniculatus* has the knees testaceous, while with *Chappelli* the legs are entirely black; then, *geniculatus* is a ♂, and although the ♂ of *Chappelli* is still unknown, yet it may pretty safely be surmised, that its male will differ in the coloration of the abdomen from the ♀, like its close ally *anticus*. If the fact of its having the legs (like *Chappelli*) entirely black is a matter of no great importance, then *D. tremulæ*, Klug (known only as a ♂) might well be considered identical with *geniculatus*; but I believe myself the latter was founded on an extreme variety of *D. fulviventris*, the ♂ of which is very inconstant in the coloration of the abdomen.

Tenthredo chloros, Rudow, S. E. Z., xxxii, 387; Kirby, List of Hymen., i, p. 292, = *viridis*, L. (*scalaris*, Kl.).

Glasgow: October, 1882.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(continued from p. 59).

Ænectra Pilleriana, Schiff.—In May last I received from Mr. W. H. B. Fletcher, of Worthing, larvæ found by him feeding on *Statice limonium* on the South coast. They were variable, rather slender, cylindrical, or when full grown slightly flattened, active, very pale green, with a narrow darker green dorsal line, spots small, whitish, with delicate hairs, head and dorsal plate jet-black, anal plate yellowish or with the dorsal region grey, the ventral region greenish, the spots large and distinctly white, and the dorsal plate brown bordered with black on both sides.

They rolled together the leaves of *Statice limonium* from above, and devoured the upper surface, when full grown changing to dark brown pupæ in a slight cocoon, each in a rolled leaf. The moths emerged in July, and were all *Ænectra Pilleriana*, a result wholly unexpected to me, as I felt sure that those with large white spots would produce *Tortrix icterana*, and the others perhaps the salt-marsh form of *T. costana*.

The description of the larva of this species quoted by Hofmann from Audouin is as follows: "Green, yellow at the sides, with numerous dark raised dots (wartlets), head and dorsal plate black, the former with a triangular white marking. From autumn to May in rolled-up

vine leaves. In the south of France it is often very mischievous, hibernating under bark of vine branches." He further says it has also been found on *Stachys*, *Iris*, and *Salvia*.

Heinemann, however, says nothing about its feeding on vine, and does not describe the larva. He merely remarks that it feeds on *Stachys germanica*, and refers to Mr. Stainton as an authority for its feeding also in the seeds of *Iris foetidissima*.

If I remember rightly, it was Mr. Bond who reared it from the last named plant. Professor Zeller remarked to me that "he could readily believe this," intimating, as I understood, that it might feed on anything. He also confirmed the account of its being attached to the vine, otherwise it would have seemed probable that Audouin's larva with "dark wartlets" might be distinct from ours with white ones.

I have carefully compared the specimens now reared with types sent me by Professor Zeller, and find that they agree accurately, except that German specimens have the ground colour of the fore-wings in the males lighter and yellower, and that the hind-wings are also paler in both sexes.

Three specimens given me many years ago by my old friend Mr. Bond agree with those now reared.

Retinia duplana.—Through the kindness of friends from time to time, opportunity has been afforded me of examining authentic specimens of almost every known or reputed British *Tortrix*, with the exception of *Retinia duplana*. Reputed *dupleana* have been sent, of course, but they have proved generally to be small *turionella*, a species of which specimens from the south of England are far larger than those from Scotland; consequently, Mr. Threlfall's notice of the capture of the former species (*ante* p. 113) awakened eager interest and enquiry. Mr. Threlfall very kindly and promptly forwarded the specimen, with the remark, "that it had been compared and found to agree with a type in one of the larger northern collections." I am sorry to say that it is not correctly named; whence I deduce the conclusion that the type with which it was compared may be in the same predicament.

This seems to confirm a suspicion which I have long entertained, that we have *no British duplana*; certainly the insect described by Wilkinson under that name is more likely to be a small *turionella*, and I therefore venture to appeal to possessors of reputed *dupleana* for evidence. I shall be exceedingly thankful for the sight of any such specimens.

I may add, that the head of *dupleana* is *grey*, not ochreous, and that there is little or no ochreous suffusion of the fore-wings.

SYNTELIIDÆ: A FAMILY TO INCLUDE *SYNTELIA* & *SPHÆRITES*,
WITH A NOTE OF A NEW SPECIES OF THE FIRST GENUS.

BY GEORGE LEWIS.

During my recent tour in Japan, I continually met with a species of *Syntelia*; I took it first in the province of Yashiu, in June, 1880, and in the autumn of the same year in South Hokkaido, and last season I met with it in early spring on the banks of the Kumakawa, in Higo, and in August in Sado. These places give the species a range of over 800 miles of latitude. It hibernates under moist bark with *Hololepta* and other flat *Histeridæ*, and in summer it comes to exuding sap in company with *Velleius*, *Helota*, *Cladognathus*, and *Rhomborrhina*. On small oaks of 6 or 8 inches diameter, where the larvæ of a large *Hepialus* were feeding in summer after the manner of our *Cossus*, I have taken all these species together, and I was inclined at the time, by its habits, to consider *Syntelia* to be an aberrant Histerid. And there is no doubt that it is very closely allied to the *Histeridæ*, but the difficulty of uniting it to that family arises from the proximity of the anterior coxæ and the prominent mesosternum which widely separates the anterior from the middle legs. Lately I submitted for examination some specimens to Dr. Sharp, and he kindly pointed out its near ally in the genus *Sphærites*, and its relationship to that insect is now evident to me to be such as exists between *Hololepta* and *Saprinus*; one is an arboreal species, the other a convex stercoraceous feeder. The prominence of the mesosternum in front of the middle coxæ seems to indicate a relation to *Lucanus*, and the spines on the tibiæ and general outline are also somewhat like *Figulus*, but the form of *Syntelia* is only analogous to the *Lucanidæ* owing to similar habits, for the club of the antennæ consists of solid rings. In *Sphærites*, the mesosternum ends abruptly as in *Hister*, and the middle and anterior coxæ, therefore, almost touch, but the shape of the pygidium and the other sections of the abdomen, the form of the antennæ, legs, and eyes connect it with *Syntelia*, and it is doubtless, as Dr. Sharp says, of the same family. The eyes at first sight seem differently constructed in *Sphærites* to *Syntelia*, but this is only owing to the sculpture and shape of the head. *Synteliidæ*, therefore, may precede *Histeridæ* in catalogues and comprise at present the two genera mentioned, which may be distinguished *inter se* by the anterior coxal cavities being closed behind in *Syntelia* and open in *Sphærites*. *Syntelia*, as a genus, extends from Mexico through Japan to East India, and in so wide a range the finding of new species

is almost certain; perhaps even genera connecting it and *Sphærites* may be found, but, unfortunately, neither insects are of the class usually sent home by ordinary collectors.

SYNTELIA HISTEROIDES, *n. sp.*

Black, shining: head with a few large scattered punctures; thorax, disc smooth with some deep punctures at the sides, lateral edge and base emarginate, elytra smooth with six deep punctate striæ, four dorsal more or less broken, one outer and one sutural complete, the last continuous, running round both the apex and base of elytra and joining the outer elytral margin. The pygidium is evenly and coarsely punctured, convex in the middle, with lateral depressions deepening and ending before the base. Beneath, the segments of the abdomen are sparsely punctured in the middle, more thickly at the sides, mesosternum behind the middle coxæ smooth in the medial region, and in front of coxæ thickly and somewhat strigosely punctate.

This species differs much from *S. indica*, the chief points of variance being colour, punctuation of pygidium, the more convex and quadrate thorax, and the deep irregular elytral striæ. The spines on the tibiæ correspond in both species. The elongation of the thorax in Westwood's figure of *indica* is somewhat exaggerated.

Length $6\frac{1}{2}$ — $7\frac{1}{2}$ lines.

Distributed in Japan, but rather rare.

Wimbledon: 7th October, 1882.

Note on Eubria palustris.—During his recent visit from America, Dr. Horn called my attention to a note of his in the "Bulletin de la Société Entomologique de France" (1879, p. cxxxviii), respecting *Eubria palustris*, which is stated by European authors to have simple claws. He points out that the male of this species has the anterior claw to all the tarsi bifid at the apex; and he expresses his belief, from the relationship which this genus bears to the allied genera, that if Coleopterists would examine their specimens, the female would be found to have the claws simple. I at once examined all accessible specimens, but found them all males. Dr. Horn, however, found in Mr. Janson's collection an example which, from a slight difference in the form of the head, and rather less impressed striæ on the elytra, he thought might be a female, and brought it to me for examination. I am glad to say that his surmise was correct, the specimen, by its simple claws, proving itself to be a female. The female of this insect must be very rare; and it would be interesting if entomologists would examine their specimens and publish the results. Great care is required in examining the claws, as the division of the apex of the claw being lateral, it is only visible when viewed from above.—CHAS. O. WATERHOUSE, British Museum: October 11th, 1882.

Coleoptera at Hunstanton.—During a short stay at Hunstanton at the latter end of August last, I captured the following (amongst many other commoner) species of Coleoptera, viz.:—*Notiophilus substriatus, rufipes*; *Dyschirius thoracicus, politus, salinus*; *Amara bifrons*; *Harpalus punctatulus, tardus*; *Cillenus lateralis* (this species was extremely abundant, in two instances I found from 20 to 30 specimens feeding together on the dead bodies of sand-hoppers; *Bembidium Stephensii, concinnum*;

Cnemidotus impressus; *Hydroporus parallelogrammus*; *Falagria thoracica*; *Bolitochara bella*; *Myrmedonia humeralis* (under a stone in a ditch); *Encephalus complicans*; *Diglossa mersa* (under stones on the beach, from one to three specimens under a stone); *Heterothops binotata*; *Ocyopus compressus*; *Xantholinus tricolor*; *Bledius tricornis*, *unicornis* (both in abundance in the salt marshes); *Nossidium pilosellum* (in plenty on the surface of a decaying stump); *Carcinops minima*; *Saprinus immundus*; *Meligethes coracinus*; *Otiorhynchus scabrosus*, *ligneus*; *Sciaphilus muricatus*; *Poöphagus nasturtii* (in some numbers on water-cress); *Psylliodes chalcomera*, *chrysocephala* var. *nigricollis*, *marcida*; *Apteropeda graminis*, *globosa*, *splendida*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: October 16th, 1882.

Solenopsis fugax at Sandown, Isle of Wight, &c.—I occasionally take a few ants when I come across any that look strange. Last Easter, at Sandown, Isle of Wight, I found under a stone a colony of *Solenopsis fugax*; the insect struck me by its minute size, which is less even than that of the London ant, *Monomorium Pharaonis* (*domesticum*). Under a stone in the Landslip near Ventnor, I found, some time ago, *Tetramorium cespitum* and *Lasius umbratus* in company. Mr. E. Saunders kindly determined all the species for me; he did not possess the *Solenopsis fugax*, so I conclude that it must be one of our rarest species. If any Hymenopterist would like a specimen, I should be happy to send him one, as I have a few to spare.

Priocnemis hyalinatus near Lincoln.—Some time ago I found, on the edge of a pine plantation at Hykelham, near Lincoln, a specimen of *Priocnemis hyalinatus*, which, I think, is one of the rarest of the *Fossores*.—W. W. FOWLER, Lincoln: October 13th, 1882.

Actidium coarctatum near Gloucester.—A short while ago (*ante* p. 20) I recorded the capture of a single specimen of *Actidium coarctatum* in a hotbed at Barnwood, near Gloucester, and mentioned the fact as being interesting as corroborating Haliday's statement that he had found this river-bank species in such a locality. As my single specimen might have been the result of accident, I may perhaps mention the fact, that I have lately found several specimens (more than a dozen) in the same hotbed in company with a profusion of *Nephanes titan*, and a few *Millidium trisulcatum*, *Ptilium foveolatum*, *Monotoma longicollis*, *Atomaria apicalis*, &c. I did not see a single *Trichopteryx*, or even *Ptenidium apicale* in the hotbed. There was a considerable amount of sawdust mixed with the manure; this hint may, perhaps, prove a useful one, as it is quite possible that the rotting wood was a great attraction.—ID.

Ceraleptus lividus, Stein, &c., at the Camber Sand-hills.—Mr. H. G. Henry and myself had a long day at the above locality on October 3rd, chiefly working at the long moss which covers the eastern side of the sand-hills. This produced us sixteen specimens of *Ceraleptus*, which, I believe, has hitherto been recorded only from Deal. Eleven specimens fell to my lot and five to that of Mr. Henry. *Rhyparochromus chiragra*, Fab., and *sabulicola*, Thoms., also turned up. *Plinthisus brevipennis*, Latr., was very common and could have been had in any numbers. *Hyperaspis reppensis*, Hbst., was somewhat abundant.—E. P. COLLETT, St. Leonards-on-Sea: October 6th, 1882.

Hemiptera and Coleoptera at Chobham.—During the last week in August and the first in September, I had some collecting at Chobham. For such success as I met with, my thanks are very largely due to Mr. Edward Saunders, who very kindly gave me the benefit of his own experience, and showed me the localities for all the best things. Amongst the more noteworthy of my captures may be mentioned the following :—

Hemiptera.—*Corizus maculatus*, by sweeping in a damp place; *Alydus calcaratus*, running and flying in sandy places and very active in the hot sunshine; *Calyptonotus pini*, chiefly in the larval form amongst dead leaves in sandy and heathy places; *Lamproplax piceus*, plentiful amongst damp rubbish at roots of rushes, &c., at Gracious Pond; this is apparently a fragile species, for, notwithstanding that many of them had evidently only just assumed the imaginal form, it was rather difficult to find specimens that possessed the full complement of legs and antennal joints; *Rhyparochromus dilatatus*, common in sandy places, amongst dead leaves &c.; *Cymus melanocephalus*, abundant by sweeping at Gracious Pond; in this species I have noticed a malformation of the antennæ different from that which so frequently occurs in the *Lygæidæ*; in two specimens one of the antennæ is considerably shorter than the other, though the normal number of joints is present; one of these has the first three joints shortened, the second and third being also thickened and darkened, and the fourth of the usual form and size; the other has the first joint normal and the other three shortened, the second and third being also thickened and darkened. *Calocoris ticinensis*, a few as the result of much sweeping at Gracious Pond; I could not find it elsewhere; I was apparently rather late for this species, as most of them were more or less damaged. *Pæciloscytus unifasciatus*, by sweeping; *Chlamydatus caricis*, abundant, the ♀ chiefly by searching at roots of rushes, and the ♂, which was much more active than its partner and readily took to flight, chiefly by sweeping in the same places; *C. pygmaeus*, not uncommon at roots of rushes where there was the greatest accumulation of dead and decaying bits of the plants, these all came by searching in such spots, I could get none by sweeping. *Nabis flavomarginatus* and *lineatus*, at roots of rushes; *Coranus subapterus* and *Salda marginalis*, in bare places on the heath; *S. Cocksii* and *Hebrus ruficeps*, in wet Sphagnum.

Coleoptera.—Being chiefly occupied with the *Hemiptera*, I secured only a few beetles, the following being the best :—*Amara infima*, under stones in bare places on the heath; *Bembidium nigricorne*, in heathy places; *Anchomenus gracilis*, *Gymnusa brevicollis*, and *Philonthus nigrita*, in wet Sphagnum; and *Cryptocephalus lineola*, by sweeping. *Cicindela sylvatica* was still about in some numbers on one part of the heath, but had to be carefully “stalked.”—E. A. BUTLER, University Lower School, Hastings: October 17th, 1882.

Description of the larva of Catoptria expallidana.—In the autumn of 1880, I found two plump, fat-looking larvæ, apparently belonging to the genus *Catoptria*, feeding in the flower-heads of the corn sow-thistle (*Sonchus arvensis*). In due course they spun up, and, in the following July, I was surprised by the emergence of *C. expallidana*. When the autumn again returned, I once more examined the sow-thistles, and found the larvæ this time in some abundance. I collected about twenty specimens, sufficient, as I thought, for all purposes, yet not a single one pro-

duced the perfect insect this summer. Many Dipterous parasites appeared which accounted for some of them, whilst the cold weather in June and July, just at the critical time of the larva's change, when, probably, a certain degree of heat is absolutely necessary to enable it to go through the process, explained, perhaps, the failure of the rest. The larva is plump and fat, somewhat attenuated behind, and with deeply cut divisions. A furrow crosses each segment rather behind the centre. Colour, orange as far as spiracular region, whitish below, the line of separation being somewhat abrupt. Occasionally, a specimen occurs in which the whole surface is whitish. Head small, chestnut; mouth black. Thoracic plate large, pale brown; anal plate faintly amber-coloured, variegated with pale brown. Its resemblance to some of its allies is very close: I compared it on several occasions with *cana* and *Scopoliana*, and could see no broad, self-evident distinction, so far as form and markings went, but there was one point that served to distinguish them at once, and that was the difference in their manners.

Scopoliana and *cana* were the slow, sluggish creatures their forms suggested, whereas my larva belied its appearance, and was quick and active in its movements. It feeds concealed in August and September on the seeds of *Sonchus arvensis*, passing, when necessary, to a fresh flower, but not uniting them with silk. The cocoon is spun just beneath the surface of the soil, and the larva remains unchanged in it till the following summer, when the pupa-case is left protruding after the emergence of the moth. The larvæ showed no tendency to wander when they had done feeding, but burrowed at once, which made me hope I should breed the perfect insect in good numbers this summer, but the cold weather altogether beat me. Outside, as well as in my breeding bottles, the insect seems to have failed, for no larvæ could be found this autumn.

That a certain amount of heat is requisite before the pupal state can be assumed, especially in the case of those larvæ that remain for a long time unchanged in their cocoons and want, as it were, to be roused up, I think I had recently a striking proof in *Ephippiphora regiana*. Wanting a few specimens, I gathered at midsummer a dozen or more cocoons: one moth came out in July, the rest of the cocoons at the present moment still contain unchanged and living larvæ.—JOHN H. WOOD, Tarrington, Ledbury: 5th October, 1882.

The question of parasitism or non-parasitism in certain Eurytomides.—I see that at p. 48 of the present volume of the Ent. Mo. Mag., it is stated that Professor Westwood read a paper at the Meeting of the Entomological Society of London, May 3rd, 1882, on this question. Mr. Fitch's opinion is also given. I think the question is already sufficiently solved in an article of mine in the "Archives Néerlandaises des Sciences exactes." v, pp. 420—27, pl. xii (1870): "Sur la manière de vivre de l'*Eurytoma longipennis*, Walk." I have there given the description of the metamorphosis and habits, with figures of the different states, and of the swellings on *Psamma arenaria*, and the parasites. I also referred to an analogous observation on the non-parasitic habits of *Eurytoma flavipes*, Först., by an unknown Entomologist in the Proc. Ent. Soc. London, ser. 3, ii, p. 141.—H. WEYENBERGH, Cordova, Argentine Republic: August 22nd, 1882.

[Dr. Weyenbergh's article maintains that *Eurytoma* is *non-parasitic*. He will

find it alluded to by Prof. Westwood in his paper as printed in Trans. Ent. Soc. Lond., 1882, p. 320, but not in an extended manner. His other reference occurs in the President's Anniversary Address to the Ent. Soc. on January 22nd, 1866, who quotes from Dr. Asa Fitch's "Reports on the Noxious, &c., Insects of New York."—Ebs.]

Parasites on Homoptera.—In his "History of Glanville's Wootton" (1878), at page 304, Mr. C. W. Dale remarks, "I wish to call attention to a very curious black parasite, about the size of a mustard-seed, adhering to the side of various species of the *Homoptera*, where the elytra join the thorax. Through the microscope it looks like a little black bag. I think it must belong to the *Acari*. Not having seen any account of it, I propose to call it *Homopterophagus dorsettensis*."

I have no doubt these parasites are *Gonatopi* in the larval condition.

As an addition to my previous note at page 116, I may now state, that on the 28th of last month I took nine specimens of *Typhlocyba cratagi*, Doug., on a hawthorn bush, one ♂, eight ♀, and of the latter two had each an ovoid parasite attached near the base of the abdomen, not so large nor so black as usual, but yellowish, fuscous outwardly. I attribute the size and light colour to immaturity, for the foster-insects were but newly disclosed, and had not attained the coloration of maturity. Unless these *Typhlocybae* hibernate (which I never knew the species to do), the parasites had but a short time before winter to feed up, which they would have to do if the host died within a few weeks.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: October 10th, 1882.

Note on Ephestia passulella.—As supplementary to Mr. Buckler's notes on *Ephestia passulella* in this month's Ent. Mo. Mag. (ante p. 104), I may add that the species is evidently double-brooded. On the 21st of June last, I received alive from Mr. Davis, of Dover, three captured pairs of the moth, which deposited a considerable quantity of eggs, and from them I have, during the last few days, been breeding imagos. Some are still pupæ, and larvæ are yet daily spinning up and changing, but all apparently are about full-grown, and show no disposition to hibernate. No doubt this brood corresponds with the one from which Mr. Buckler's eggs were obtained; the moths sent me in June were rather late specimens, as Mr. Davis had been taking the species some time previously. My moths deposited their eggs on figs, on which the larvæ have fed throughout. Their glass jar has stood in a cold room facing the north.—GEO. T. PORRITT, Huddersfield: October 2nd, 1882.

Error as to occurrence of Retinia duplana.—Mr. Barrett informs me that my supposed *Retinia duplana* is a male of *Eriopsela quadrana*. The specimen was named from a "type" in Mr. Hodgkinson's collection, and the mistake is thus accounted for. I owe Mr. Barrett my thanks for thus putting the identity of the insect beyond a doubt.—I. H. THRELFALL, 4, East Cliff, Preston: October 14th, 1882.

Obituary.

Dr. G. H. K. Thwaites, F.R.S., F.L.S., died at Kandy, Ceylon, on September 11th, in his 72nd year. He was best known as the Director of the Botanic Garden

at Peradeniya, Ceylon, a position he had held since 1849 till his retirement a few years since, and his name will long be remembered in connection with the spread of *Cinchona* culture, &c., in the island. Before his departure for the east he had made a reputation as a cryptogamic botanist, but he also turned his attention to Entomology and published several short notes in the Proceedings of the Entomological Society, &c. During his long residence in Ceylon he constantly forwarded consignments of insects to his friend Professor Westwood, who has described many curious forms (especially in *Paussidæ*) from his collections. Only last year Professor Westwood described a singular larval form, sent by him, the ordinal position of which remains doubtful (*cf.* Trans. Ent. Soc., 1881, pp. 601—603, pl. xxii). He was a man of simple habits, and for many years a strict vegetarian. He was elected into the Entomological Society so long back as 1838, into the Linnean Society in 1854, and into the Royal Society in 1865.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Sept. 6th*, 1882: H. T. STANTON, Esq., F.R.S., &c., President, in the Chair.

Mr. J. Jenner Weir stated that he had recently observed an eel rise and take a caterpillar from off the edge of a leaf of *Nuphar lutea*; and he referred to a recent article in Chambers's Journal with regard to the proceedings of a pet trout, and its discrimination of caterpillars in respect to colour, &c.

Mr. McLachlan exhibited about 500 specimens of *Neuroptera* of various families, being part of a collection he had made in July, chiefly in Switzerland and in the Val Anzasca, North Italy. Amongst others were twelve species of *Rhyacophila*, including about forty examples of a new species from the Val Anzasca (and Val Cannobina), and several of *Rh. Meyeri*, McLach. (from the same localities), hitherto known from a single specimen. There were also many specimens of *Coniopterygida*, including a species in which the wings (at any rate, in one sex) were marked with grey blotches (from the Val d'Anniviers), and another with nearly black wings (from Val Levantina), both divergent from the ordinary unicolorous white condition. He also exhibited a large piece of the so-called "indusial limestone" of Auvergne, recently given to him by Mr. H. W. Jackson, M.R.C.S., F.G.S., who had obtained it from near Romagnat in Auvergne. In calling attention to the fact that this singular geological formation appeared to consist entirely of masses of shell-covered caddis-cases, he read an extract from Lyell's "Manual of Elementary Geology," in which a probable explanation of the circumstances tending to produce the formation is given. He also stated, that although these cases must have pertained to the *Limnophilidæ*, fossil remains of insects of that family of *Trichoptera* were almost unknown, whereas others, of other families, apparently less suited for preservation in a fossil state, were plentiful.

The Rev. H. S. Gorham asked why it was that recent cases of this kind were so frequently formed wholly of one kind of shell?

Mr. McLachlan said it was apparently owing to the conditions under which particular larvæ found themselves with regard to building materials.

Miss E. A. Ormerod exhibited a species of *Lina*, which was stated to be doing great damage to hazels and willows in Norway. She also made some remarks on "rape-seed cake," and its effects upon wire-worms. The Indian cake was manu-

factured from mustard, and wire-worms feeding upon it when in a putrescent condition soon died, whereas they thrive on the English cake, which was manufactured from rape.

Mr. Billups exhibited a large number of *Leptidia brevipennis*, Muls. (cf. ante p. 90), both living and dead, obtained in the Borough Market, London, from willow baskets imported from Cherbourg.

Mr. C. O. Waterhouse exhibited a pair of antelope horns from Durban, South Africa, greatly infested by the larvæ of *Tinea vastella*, the cases of which projected from them in all directions.*

Mr. Olliff exhibited specimens of *Synchita juglandis*, a rare British beetle, found under bark of beech at Tunbridge Wells.

Sir S. S. Saunders read a paper on two new species of fig insects, one of which had been sent from Calcutta, and fed upon *Ficus religiosa*; the other was from Queensland, and frequented *Ficus macrophylla*, locally known as "the Moreton Bay Fig."

4th October, 1882.—THE PRESIDENT in the Chair.

F. Swanzy, Esq., of Sevenoaks, was elected an ordinary Member, and Herr Gustav Weymer, of Elberfeld, a Foreign Member.

Mr. McLachlan exhibited nymph skins of *Haagenius brevistylas*, Selys, a dragon-fly of the sub-family *Gomphina*, remarkable for their very broad and depressed form. They had been collected in Texas by the late Jacob Boll. He called attention to L. Cabot's description and figure published in 1872.

Mr. C. O. Waterhouse stated that the beetle destructive to beer-casks in Rangoon, exhibited at the Meeting on August 2nd (cf. ante p. 120), was not *Tomicus* (*Xyleborus*) *Saxseni*, but identical with a species described by Wollaston from Madeira as *Tomicus perforatus*, and by Walker from Ceylon as *Bostrychus testaceus*, the former name taking priority. He had seen it from both the old and new worlds, but it was not a British species.

Mr. McLachlan said this information had an important bearing upon the question as to whether the greater portion of wood-boring *Coleoptera* attack healthy living trees, or only those in which decay from other causes had already commenced, for in this case the beetles must have attacked the wood of the casks after the latter had been exported. He expressed his firm belief that such insects are not the primary cause of decay and death in trees, but only precipitate the result.

Prof. Westwood stated that Audouin's experiments tended to prove that these insects attacked healthy trees.

The Rev. H. S. Gorham and Mr. Waterhouse were of opinion that they did not do so, and agreed entirely with Mr. McLachlan as to the conditions favouring the attacks.

Prof. Westwood read "Further descriptions of insects infesting figs," in which a number of new forms were described (with accompanying figures). He pointed out how very numerous these minute fig-frequenting *Hymenoptera* were gradually proving themselves, and their importance as connected with the process of caprification. In effect they appeared to exist wherever the genus *Ficus* existed in a natural state. He was now acquainted with a multitude of species.

Mr. G. Lewis read a paper in which he attempted to prove that colour in insects is solely due to the action of light; adducing a large number of instances in support of his theory. The reading of this paper caused considerable discussion.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(continued from p. 33).

19. CHORTOPHILA, Macq., Rond.

Anthomyia, p. Meig., Schin., Walk.*Aricia*, p. Zett.*Hylephila*, p. Rond.*Hammomyia*, p. Rond.

Gen. ch.—Eyes bare, contiguous, sub-contiguous, or sub-remote, in the males, approximate or remote in the females; arista pubescent or bare; face more or less prominent; abdomen mostly cylindrical in the males; alulets with small equal-sized scales; wings with the anal veins prolonged to the margin; legs black.

Sect. 1—*Forehead and face very prominent (buccate).*

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| 1. BUCCATA, Fall. | 3. ALBESCENS, Zett. |
| 2. UNILINEATA, Zett. | <i>albula</i> , Meig. |
| | 4. ARENOSA, Zett. |

Sect. 2—*Forehead and face but slightly prominent.*

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|-------------------------------|-------------------------|
| 5. IMPUDICA, Rond. | 8. CINERELLA, Fall. |
| <i>varicolor</i> , p. ? Meig. | <i>pusilla</i> ?, Meig. |
| 6. TRAPEZINA, Zett. | 9. SEPIA, Meig. |
| 7. CINEREA, Fall. | 10. BILLBERGI, Zett. |

All the species in the first Section appear to be parasitic upon wild bees, and are, therefore, generally found in the vicinity of their burrows or nests.

C. BUCCATA, Fall.

This, the typical species of the group, has the face very prominent, of a silky-white or yellowish colour. The eyes are sub-contiguous in both sexes, though slightly wider apart in the females than in the males. The antennæ are small and short, especially in the females; the third joint being but slightly longer than the second. The arista is thickened at its base, almost bare in the males, but pubescent in the females. The thorax is whitish-grey, with the sides almost white; it is indistinctly striped. The abdomen is whitish-grey with black reflections, and an interrupted longitudinal dorsal stripe; it is cylindrico-conical, with small inflexed pale grey anal segments in the male, and ovoid, with pointed apex, in the female. The wings have the external transverse veins oblique, and slightly sinuous. The legs have the posterior tibiæ almost bare on their inner sides.

This species is of local occurrence. I captured several in May, 1881, on a piece of rocky ground at Silverdale, in Lancashire, near the burrows of some wild bees. I caught two of the bees while entering their holes, and on submitting them to Mr. Bridgman, he kindly named them as *Andrena albicans* and *Andrena fulva*.

C. UNILINEATA, Zett.

This species closely resembles the last; it is usually, however, rather smaller and more slender. The eyes are rather more widely separated in the males and much further apart in the females than those of *A. buccata*; the space between them in the latter sex being equal to about one-fourth of the width of the head. The transverse veins of the wings are usually very sinuous, especially in the males; and the hind tibiae of the same sex are furnished with a tuft or series of soft hairs in the middle of their inner sides.

Not common. I captured both sexes in 1875, at Bowdon, in Cheshire, while on a visit to my friend, Mr. B. Cooke, and I have also received specimens from his own collection.

C. ALBESCENS, Zett.

This species resembles the two preceding ones in form and colour; it is, however, usually of a much smaller size, though it varies greatly in magnitude. There appear to be two distinct varieties, one as large again as the other; the former measuring 5 to 6 mm. ($2\frac{1}{2}$ to 3 lin.), and the latter only about 3 mm. The chief characteristic feature is the sub-plumose arista, on account of which Rondani placed it in a distinct genus (*Hammomyia*). The position of the eyes is much the same as in *C. unilineata*, but they are usually rather more widely separated in both sexes than in that species. The legs have the fore tibiae ciliated along their outer sides with short hairs, in the males of the larger variety; and the hind tibiae are also furnished with soft hairs on their inner and front sides.

Found in sandy places, but not common.

C. ARENOSA, Zett.

This well-marked little species is rather aberrant in its characters, for while it has the face very prominent, and resembles in its general features and habits the other species in this section, it differs from them all by having the abdomen depressed or flattened at the base, but thickened at the apex by the presence of large sub-anal male appendages. The eyes of the males are sub-contiguous, and those of the females widely separated. The hind tibiae of the former are armed along the whole length of their inner sides with rigid hairs or bristles of moderate and even length. The colour, especially on the thorax, is very pale, almost white.

Rare or rather local. It chiefly frequents marine sand-hills. The only specimens that I have seen were given to me by Mr. B. Cooke, and were taken by him at Southport, in Lancashire, where it is not uncommon.

C. IMPUDICA, Rond.

This species is characterized by the males having two large sub-ventral lobes on the penultimate segment of the abdomen, armed with minute black spines, and with a reddish spot at their base. The eyes are sub-contiguous in the males, and widely separated in the females. The thorax is bristly, of a darkish grey colour, with a central and two narrow irregular lateral black stripes; the sides are cinereous. The abdomen is hairy, light grey, with an interrupted longitudinal dorsal stripe; the portions of which are often dilated into triangular spots. The legs are furnished with many hairs and bristles, but the hind tibiae have few or none on their inner

sides. The females have the thorax and abdomen coloured and marked in a similar manner to those of the males, the latter part is conical with a pointed apex.

Generally distributed.

Size, from 6 to 7 mm. (about 3 lines).

I believe that this species has been confounded with *C. varicolor*, Meig., a British specimen of which I have not yet seen. The latter (of which I possess a typical example named by Rondani) has the abdomen laterally compressed, and destitute of the large sub-anal lobular appendages.

C. TRAPEZINA, Zett.

This bears a considerable resemblance to *C. impudica*, but is darker in colour than that species, less hairy, has the abdomen of the male more depressed (less cylindrical), with smaller ventral lobes without a red spot at their base, and is marked along the dorsum with a series of triangular or sub-quadrated black spots. The thorax has three black stripes, which are nearer together than those in *C. impudica*, and there are often two lateral ones in addition.

The hind tibiæ of the males are armed with three or four bristles in the middle of their inner surfaces.

The female is lighter in colour than the male, and often has both thorax and abdomen almost immaculate.

Not uncommon.

C. CINEREA, Fall.

This species is characterized by its grey colour and almost immaculate thorax. The face is rather prominent, that of the female being more so than that of the male. The abdomen in the latter sex is sub-cylindrical, somewhat flattened, clothed with numerous black hairs, and showing dark reflections when viewed in some directions; it has also a narrow sub-interrupted dorsal stripe, and tapers a little towards the apex, which is round, projecting, and of a grey colour, with two hairy lobular appendages on its under-surface. The legs are long and spinose; the hind tibiæ of the males being armed along their inner sides, for nearly their whole length, with a series of short stiff hairs, of sub-equal lengths.

The female has the thorax often marked on its front margin with two narrow brown stripes, placed near together. The abdomen is conical, pointed, mostly unstriped, and closely resembling in shape that of the female of *Hydrophora conica*.

The length of this species is usually from 7 to 8 mm. (3 to 4 lin.), the females being mostly the larger. It is not uncommon; the females are much more frequently seen than the males, and are often noticed on the flowers of *Chrysanthemum leucanthemum* (the ox eye).

C. CINERELLA, Fall.

This little species has the thorax and abdomen coated with grey dust-like scales (*cinereo-farinosus*); the former is indistinctly striped, except by four dorsal rows of small black bristles; and the latter, which is cylindrico-conical in the males, is marked by a central dorsal line of small triangular spots. The hind femora, as pointed out by Rondani, are destitute of bristles on the basal half of their under-surfaces, and the hind tibiæ are bare on their inner sides.*

* Rondani also observed that the epistome is very prominent.

I believe this species to be identical with the *A. pusilla* of Meigen and Schiner. It is not the same as the *A. cinerella* of Meigen, which belongs to the genus *Hylemyia*.

It is not common.

C. SEPIA, Meig.

This small dark fly is characterized by being rather short and thick, with shortish wings, which are nigrescent at the base. It is hairy, with the thorax dark grey, having a central black stripe, which is sometimes indistinct. The face is rather prominent, and the eyes of the males are sub-contiguous. The abdomen in the same sex is black, hairy, thick, and cylindrical, with the apex large and inflexed, having two projecting sub-anal hairy lamellæ. A wide interrupted dorsal band, formed by large sub-quadrate black spots, may be seen in certain lights. I have not seen the female.

This species is usually found in corn-fields, but is not very common; Rondani says that the larvæ live in the culms of wheat and other graminaceæ.

C. BILLBERGI, Zett.

This is an aberrant species, the generic position of which it is rather difficult to determine. Schiner places it along with its congener, *M. sylvestris*, Fall. (of which I have not seen a British example) in the genus *Eriphia* of Meigen. Another genus, of which it possesses many of the characters, is *Pogonomyia* of Rondani; it does not possess, however, the distinctive points assigned by the latter author to the species placed in either of the above genera, for it has the scales of the alulets very small and equal in size, and the anal veins prolonged to the margin of the wings. In the face of these difficulties I have thought it best to place it, at least provisionally, in the present genus.

It may be known by its black colour, its rather elongated form, the approximation of the eyes in both sexes, and the dilatation of the second and third joints of the fore tarsi in the females. The face and epistome are both rather prominent, and the latter is furnished with numerous bristles. The eyes are sub-contiguous in the males, and only slightly more separated in the females. The antennæ are rather short, with the second joint setose; the arista is bare and thickened at the base. The thorax is of a shining blackish-grey colour, with whitish shoulders and sides. The abdomen in the male is cylindrico-conical, hairy, cinereous, with a central dorsal longitudinal black stripe; it has the apex rounded, projecting, shining black, hairy beneath, and furnished with two moderate-sized sub-anal lamellæ. In the female the abdomen is black, shining, immaculate, rather depressed, and with a pointed apex. The legs of the female are peculiar in having the second and third joints of the fore tarsi somewhat dilated.

Zetterstedt appears to have confused the sexes together, for he says, "Abdomen in utroque sexu ovato-lanceolatum, sub-depressum apice acutum," which only applies to the female, and he has made the mistake of attributing the possession of the dilated tarsal joints to the male, an error into which Schiner has also fallen.

This is an Alpine species. I found several specimens of both sexes in May, 1875, in the woods upon the summit of one of the lofty hills surmounting the ruins of Bolton Abbey, in Craven, Yorkshire.

(To be continued).

NATURAL HISTORY OF *ENDOTRICHA FLAMMEALIS*.

BY WILLIAM BUCKLER.

While engaged in studying *flammealis* from the egg to the perfect insect, it has been my good fortune again to be associated with Mr. Wm. R. Jeffrey in the deeply interesting task, who not only at the beginning supplied me with ova, but subsequently with the most favoured and promising of his larvæ, on occasions, and at a very critical period when failure seemed almost inevitable, and for his kind and invaluable assistance my grateful thanks are here recorded.

I received the eggs on 28th of July, 1881, about a dozen of them being laid deep among the long hairs in the axils of the flower and stalk of *Lotus major*, fourteen on leaves of *Corylus avellana*, five on a spray of *Melampyrum pratense*, and one on a leaf of sallow.

The eggs hatched in the morning of 7th of August, and the young larvæ were supplied with leaves of all the above mentioned and a tender young leaf of oak in addition; at the end of three days the softest of the hazel leaves showed a decided preference had been given to them by the tiny larvæ, though the *Lotus* had also been eaten, but of the other leaves only the oak showed any trace of attack, and in so slight a manner that it was not tried again for some time.

At the end of a week many were laid up for their first moult, and this operation was not completed until the 17th, when the needful changing of food became a hazardous piece of work, and proved fatal to a few of the larvæ.

Two individuals more forward than the others got over their second moult on the 26th, while their companions lay waiting for their turn, and by the time they had completed their change of skin I became unpleasantly aware of having no more than eight larvæ in all remaining.

The third moult happened with one larva on the 8th of September, and to the remainder on the 11th to 13th, and while changing their food next day my long growing suspicion of cannibalism was verified—for, just as on previous occasions, another larva was missing, and on my scrutinizing what seemed a cast skin, it proved too surely to be the remains of a larva, in great part devoured, and I had no doubt of the culprit being that one which had moulted soonest, it having slain its victim while helplessly laid up.

Hitherto, while changing food, I had occasionally noticed a dead larva in a suspicious condition, but they were too few to account for the number of mysterious disappearances which began after the first

moulting and continued at intervals ; their propensity was now noticed by Mr. Jeffrey, who reported finding one of his larvæ badly bitten, and mine presently being reduced in number to six, I took the precaution henceforth, to keep each separate.

After this they continued to feed a little, as evidenced by ravages in the food and by small heaps of frass, at intervals ; although they always seemed to me to be sleeping away their time as though it was of no importance whatever, and their growth was most remarkably slow, though singularly enough, Mr. Jeffrey succeeded in bringing one of his brood—but only one—to full-growth by 5th of November, when he very kindly sent it to me to watch, to figure, and note, and on the 10th it spun up ; but as no other of his nor any of mine could be induced to follow this example, and as the proper time for any further moult had long expired without the occurrence, and cold weather coming, I unwillingly saw they intended to hibernate, and feed up in spring ; and this really proved to be the case, for, with the above-mentioned single exception, none became full-fed much before the end of May, 1882.

The perfect insects, male and female, eight in number were bred by Mr. Jeffery, and three also by myself, from June 29th to July 11th.

The egg of *flammealis* is a longish-oval in shape, rather large for the size of the insect, the shell, minutely pitted on the surface, is whitish and glistening ; it adheres to the substance whereon it is laid either on its side or standing on end, as well also to each other when laid in little clusters, and I found after six days it was very faintly tinged with greenish and in four more days it hatched.

The newly-hatched larva is very slender, translucent, and so slightly tinged with flesh-colour as to be almost white, with grey-brown head and narrow plate on the second segment ; on the third day after feeding on hazel the body is tinged internally with crimson, or if fed with the flower and leaves of *Lotus major* only, the internal vessel is tinted with bright green, and in either case the head and narrow plate are of a deep bright red ; it nibbles away little holes quite through the leaf at some time or other during the first twenty-four hours, from either the upper or under-surface, but is soon after to be found on the under-side where it has spun for itself a little web of such delicate gossamer as to be hardly visible on the hazel leaf, or in the flower and leaflets of the *Lotus*.

After the first moult it is still slender, the head and plate are dark reddish-brown, the skin of the body less translucent, though still tinged with red from the interior, and now, by help of a strong

lens, two rows of most minute brown dots can just be discerned on the back; the narrow silken somewhat tubular hammock is extremely thin and of pale brownish colour, wherein the occupant lies curled up motionless, and might be very easily overlooked without arresting notice as a larva.

After the second moult it is grown but little, and seems very much as before, except that the skin of the body generally is more opaque, and bears a faint tinge of bluish-green above and a paler tint of greenish-drab below, the dark red head is followed by the darker brownish red plate, and a very small dark plate appears on the anal flap, the brown tubercular dots are more noticeable; it seems always at rest in a close coil, either at one end or in the middle of its long transparent brownish web, and if turned out of its abode to examine is very timid, seldom uncoils, and for a long time is afraid to move; though not detected either by Mr. Jeffrey or myself in the act of feeding, yet, that it feeds well, probably at night, is shown by portions eaten out from leaves of hazel and *Lotus major*, and also, as Mr. Jeffrey advised me, from tender leaves of *Agrimonia eupatoria*, sallow, and hornbeam.

After the third moult the skin is quite opaque and of a dark chocolate-brown colour above, a very dingy pinkish beneath, the head rather widest in front near the mouth and a trifle flattened, is of brownish-red colour, the plate on the second segment is broad, blackish-brown, and for a time appears dorsally divided, the small anal plate is of the same dark colour, the tubercular dots are rough, blackish, and ranged on either side of the back longitudinally *in a straight line with each other*, each dot bearing a fine hair; a most remarkable addition occurs a little below these on either side nearly close to the beginning of each segment beyond the thoracic, in that of a small ocellated crater-shaped spot with dark brown centre bearing a hair, other rough dark dull dots, similar to those on the back, occupy the usual tubercular situations along the sides and ventral region, the fifth and sixth segments on the belly have a transverse series of these close together: the grey-brown web it spins for its dwelling amongst the leaves now arrests attention from its curious construction, as when seen while the twigs are in an upright position, the web is partitioned off into several cells or chambers, one above the other, by delicate diaphragms or floors, so to speak, varying in number, but often as many as from three to five, openly wrought and with fine connecting threads, the larva occupying sometimes one chamber sometimes another, almost always in its characteristic posture with the tail curled round

either across the second segment or over the head; if turned out it feigns death for a long time, but when once it recovers from its fright it nimbly advances or retreats backwards in efforts to escape.

By the 19th of September, it is 12 mm. long, and is in a state of transition from its previous habit of eating growing leaves, which, as autumn advances, gradually die, and it accustoms itself by degrees to feed on those leaves of sallow and hazel, or of hornbeam, that are getting more discoloured and softened with blotches of incipient decay before falling, thus it acquires the changed habit of feeding on decaying leaves, although it will yet, for a short time, occasionally vary its diet by eating a small portion from a green privet leaf, or even a small oak leaf if very tender, though at no time does it seem to really like either, and very soon it entirely rejects those leaves that may still linger in a comparatively green state.

The changed quality of its food seems to affect the colouring of the larva, for, by the end of September, it is of a dark purplish-brown more dingy than before, the previous dorsal division on the neck-plate has disappeared and the plate is now wholly black and shining, and it is altogether quite in harmony with its surroundings on the earth, where in a state of nature it would be, during winter, in the midst of fallen leaves of various kinds, and sure to find some with the requisite qualities of moisture and tenderness agreeable to its taste, and with these most probably it would not be very particular in its choice.

After hibernation and when full-grown the larva is from 16 to 18 mm. in length, its proportions are rather slender as far as the sixth segment thence gradually thickening towards the ninth, then as gently decreasing to the end of the eleventh, and more tapering to the end of the thirteenth, the head is a trifle narrower than the second segment, the third and fourth have deepish and sub-divided wrinkles, the remainder are well divided, and each is on the back sub-divided in the middle by *two deep wrinkles very close together*, a distinguishing character from a very early stage, the front sub-division of the thirteenth is long and the anal flap short, the ventral legs are small, the stouter anal pair extended backwards, the tubercular dots are as before but not a trace can be seen of the crater-shaped spots before mentioned, they are obsolete, the fine rugosity which had previously made the skin so dull is now much smoothed away, the general colouring too is rather less dark on the back and sides, the spiracles are round and black but so minute as only to be seen with help from a powerful lens, the head is rather darker than before, the papillæ pale and translucent, the collar plate blackish-brown, all the legs pale greyish-drab and rather

transparent, the anal plate is blackish on the front and side margins, brownish-grey behind, the belly has a brownish-ochreous tinge and somewhat of this modifies the darker chocolate-brown of the back, assimilating well with the few old decaying leaves in spring that can yet be found lingering on in the haunts of the insect.

The cocoon, formed by the larva that was prematurely full-fed, on withering leaves of sallow, on the 10th of November, was of a roundish oval figure, composed of greyish-drab coloured silk, spun on the under-side of one of the leaves and joined in part to another, the silken surface exposed to view became in course of the night following finished off with a number of small particles of greenish leaf sprinkled irregularly over it, and adhering, gave just the speckled aspect the under-side of the sallow leaf presented so often at that time, both leaf stalks were fastened to the twigs with thick moorings of silk, and one end of the cocoon being attached to the vessel wherein it was kept for observation, seemed suggestive of an innate habit under favouring circumstances of securing the cocoon to some fixed object; a day later it became needful for its removal to sever this attachment, causing a hole, exposing much of the larva to view and allowing me to note its already changing colour, but it was quite equal to the mishap, for within a few hours it spun a quantity of silk over the hole and prevented any further observation.

The above exceptional instance induces me to add that all the other larvæ of *flammealis* remaining alive in spring spun themselves up during the last few days in May, both with Mr. Jeffrey and myself, and that one of mine was in an oval cocoon of 13 by 6 mm. diameters, covered with particles of earth and of dead leaf, half sunk in the soil and attached to a dead leaf lying on the surface above with other leaves matted together; another cocoon had but little earth in its covering, and was chiefly composed of decayed leaf of hornbeam and hazel, situated partly within a curled-up leaf of the former kind to which and to a little moss it was fastened: another, was a most clever adaptation of the lower part of a dead sallow leaf with foot stalk remaining, the edges of the leaf having been drawn round to meet, and fastened with silk formed a hollow cone, which at the open end had been stopped with grey-brown silk and the interior smoothly lined with similar material; in this the old larval skin lay next the foot stalk at the pointed end, and the tail of the pupa next, altogether 15 mm. in length.

The pupa itself is $8\frac{1}{4}$ mm. long, its general figure very much of ordinary form, the head and eye-pieces moderately well developed, the

thorax well produced, with distinct sub-divisions, is slightly keeled, the hind margin on either side strongly prominent, and convexly sloping downward to the central point or end of the keel, the wing-covers slant off towards the ends of the antennæ and leg-cases which are long, the movable rings of the abdomen have a punctate surface, but are smoothly cut at the divisions, the spiracles rather prominent especially the largest on the twelfth, the abdominal tip is a little prolonged, rounded and furnished with two longish curly-topped bristles surrounded with four others of shorter lengths; its colour is very dark mahogany-brown approaching to blackish at the anal tip, and with a glossy surface.

Emsworth: *November 10th*, 1882.

[The mystery surrounding the transformations of *Endstricha flammealis* has been simultaneously dispelled by the independent observations of investigators of different nationality. At the meeting of the "Société Entomologique de Belgique," held on the 7th October, 1882, Dr. Heylaerts read a description of the larva and its habits, as observed by him in Holland; it is not so detailed as Mr. Buckler's, and there are certain small discrepancies between the two, but the results are practically the same.—EDS.]

ADDITION TO THE BRITISH FAUNA OF A NEW GENUS AND SPECIES OF *HEMIPTERA-HOMOPTERA*.

BY JOHN SCOTT.

In the beginning of August last, in company with my friend Mr. Bignell, I paid a visit to a little meadow near to a place called Cann-quarry, in the direction of Bickleigh Vale, where he had often been before, in search of parasites, and I, for the first time, in the hope of picking up some rare or new species of the spring-heeled *Psyllidæ*. The weather was all that could be desired, and our hopes of success were, on this account much heightened. But "the best laid schemes o' mice an' men, gang aft agley," and we found that the insects, at least the kinds we were in search of, seemed to have deserted the locality, as we worked on for a considerable time without any luck falling to us. At last Mr. Bignell called my attention to a Homopteron he had just swept into his net, but from what plant he was unable to say. It was speedily boxed, and we went on sweeping and beating for more. After a long interval he took a second specimen, and said he thought he had got it off the fern (*Pteris aquilina*) which grows abundantly there. So, setting to work to try and establish the fact, I soon pronounced for it by the capture of several individuals.

A day or two afterwards we paid a visit to Shaughbridge, a magnificent piece of mountain scenery in the same neighbourhood, and where the fern grows even more thickly than at the former place; but here we were doomed to utter disappointment, probably owing to the great quantity of the plant and the less open nature of the ground in consequence, for after beating and searching about for hours, we were not favoured with even a glimpse of the insect. There was now nothing left for us to do except again to visit the first locality. This we did in the course of a day or two, and I had the pleasure of taking a goodly number, principally females. Neither a *Psylla* nor a *Trioza* passed into my bottle, but I was equally gratified with the capture of the insect about to be described.

PLATYMETOPIUS, Burm.

Head: crown (without the eyes) pentagonal, apex acute, sides next the eyes shortest; anterior sides slightly convex, about as long as the length down the centre; posterior margin slightly concave; disc slightly concave or reflexed at the apex: *eyes* placed on the sides of the head; viewed from above spherical triangular; outer margin continued in the same curve with the anterior sides of the crown, and extending posteriorly for a short distance beyond the posterior margin: *face*, between the antennæ, at least one-fourth less than the length down the centre; sides slightly narrowing towards the base of the clypeus: *clypeus* obtusely angulate at the apex. *Antennæ* placed in a deep cavity above the middle of the eyes; 1st and 2nd joints stout.

These are the principal characters which seem to separate the present genus from that of *Deltocephalus*, to which it is very closely allied; Burmeister being the first to characterize the genera in his Gen. Ins. (1838).

PLATYMETOPIUS UNDATUS.

Cicada undata, Deg., Mém., iii, 119, 5, t. 11, fig. 24; Fall., Hem. Suec., ii, 29, 7; *Cicada vittata*, Fab., E. S., iv, 35, 33; S. R., 67, 23 (nec Linn.); *Jassus vittatus*, Germ., F. I. E., 7, 20; *Jassus* (*Platymetopius*) *undatus*, Flor, Rhyn. Livl., ii, 221; Kirschb., Cicad., 147, 127; *Platymetopius undatus*, Fieb., Verh. K. K. z.-b. Ges., xix, 202, T. 6, fig. 64; J. Sahlb., Cicad., 296, 1; *Jassus* (*Platymetopius*) *undulatus*, Thomson, Opusc. Ent., i, 46, 1.

Bright lemon or canary-coloured, shining. *Head*: crown chocolate-brown, more or less thickly and finely spotted with yellow; anterior sides narrowly yellow; extreme margin with a minute puncture near each eye: *frons*, *face*, *cheeks*, *clypeus*, and *rostrum*, yellow, apex of the last narrowly black. *Antennæ*: cavity black; three basal joints yellow; *setæ* brownish.

Thorax: *pronotum* chocolate-brown, very finely but irregularly spotted with

yellow; lateral margins yellow. *Scutellum* chocolate-brown, very finely but irregularly spotted with yellow; beyond the middle a narrow transverse channel curving round posteriorly near its extremities; apical portion cordate, finely wrinkled transversely. *Elytra* bright lemon or canary-coloured yellow, shining, with a broad, chocolate-brown, longitudinal streak next the suture, extending to the apex, its outer edge waved, or with two bays forming a \wedge -shaped character; *clavus* next the suture, with three minute, almost equidistant, white spots, generally bordered with black; *corium*: the three central ante-apical areas with a minute white spot in each near to their extremities, immediately opposite to which are three others in the apical areas. *Legs* pale yellow: *tibiae*, margins of the 3rd pair with long, spinose, yellow hairs, each set in a minute dark chocolate-brown puncture: *tarsi* pale yellow, apices of the joints very narrowly chocolate-brown: *claws* dark brown.

♂. *Abdomen*, above, black, side margins yellow; underneath bright yellow; base with a small, black trilobate patch in the middle; genitalia, above, black, underneath, yellow. Length, ♂, 2—2½ lines; ♀, 2½—3 lines (Paris).

In his "List of British Hemiptera, &c.," Walker gives *Deltocephalus vittatus*, Linn., citing Germar's figure of *Jassus vittatus*, which, as above indicated, represents *C. undata*, Deg., but there is no record of the capture of the latter in Britain until now, although the species is distributed throughout Europe. *C. vittata*, Linn., is our *Eupteryx vittatus*.

Lewisham: 5th November, 1882.

CONTRIBUTIONS TO A KNOWLEDGE OF THE RHYNCHOTAL FAUNA OF SUMATRA.

BY W. L. DISTANT.

The following descriptions refer to species which I have received during the last few years in collections made by Messrs. Forbes and Bock. The collection of *Rhynchota* is evidently a pursuit which is by no means a speciality of those gentlemen, as the small and obscure representatives of the Order are almost entirely unrepresented in their consignments, which have consequently added less, than might have been expected, to our knowledge of this little-known fauna. Our present information as to the *Rhynchota* of Sumatra is greatly due to Snellen van Vollenhoven, whose studies, however, did not extend to the *Coreidae* of this island; to Ellenrieder, who alone treated of the *Pentatomidæ*; to various descriptions by the late Dr. Stål; and the same, in a much less satisfactory sense, of the late Mr. Walker. It will be thus seen that, at present, our catalogues and collections of Sumatran *Rhynchota* are of the most meagre and superficial character, though we may reasonably hope that this comparative ignorance will soon be greatly modified by the publication of the Natural History

section of the late Dutch Expedition into Central Sumatra: one volume of this section, under the editorship of J. F. Snelleman, has already appeared at Leyden, and contains notices of the *Coleoptera*, *Diptera*, *Neuroptera*, &c.

HEMIPTERA-HETEROPTERA.

Fam. PENTATOMIDÆ.

Canthecona cognata, n. sp.

Very closely allied to *C. javana*, Dall., and in general appearance perfectly resembling that species, but differing in having the produced lateral angles of the pronotum almost straight, and not curved and directed forwardly, and with their apices obtusely and not long and acutely spinous as in the Javan species.

Length, 13 mm. Breadth of angles of pronotum, 8 mm.

Hab.: Sumatra (Forbes).

NEOSALICA, n. gen.

Antennæ five-jointed, third joint very small, the basal joint distinctly passing apex of head. Pronotum with the anterior angles rounded, the lateral margins carinate and sub-erect, the anterior portion rounded, sinuated about centre, the lateral angles produced in straight acute spines, the posterior margin amplified and produced over base of scutellum. Scutellum longer than broad, the apex rounded, and slightly passing base of membrane, and with a distinct central longitudinal carinate line. Corium with the apical margin very strongly sinuated. Abdomen with the connexivum extending beyond margins of corium, segmental basal angles produced and spinous. Rostrum extending a little beyond anterior coxæ. Metasternum with a central sub-triangular keel, of which the basal angles are sub-produced, and the apex narrowed and extending to intermediate coxæ. Mesosternum with a slightly raised, narrow, triangular keel, the apex of which is very narrow, and reaches anterior coxæ, and the base very prominently raised in a transverse ridge between the intermediate coxæ. Femora slightly thickened, the tibiæ sulcated.

Neosalica is allied to *Piezosternum*, especially to that form of the genus represented by *P. excellens*, Walker, for the reception of which that author proposed a new genus, "*Salica*." It is easily distinguished by the sternal keel not being produced beyond the intermediate coxæ.

Neosalica Forbesi, n. sp.

Obscure ochraceous; antennæ, lateral margins of the head with the inner margins of lateral lobes, lateral margins of pronotum, base and apical margin of scutellum, connexivum, and stigmata black; apical portion of fourth joint of

antennæ, a rounded callosity at each basal angle of scutellum, a small sub-quadrate spot on each segmental lateral margin both above and beneath, margins of stigmata, acetabula and apex of anal appendage, luteous; membrane bronzy, with the apical margins pale, the apices broadly so; body beneath pale castaneous, the disc of abdomen, longitudinally and faintly piceous; rostrum and legs dark castaneous; abdomen above green, the apex castaneous. Antennæ with the second and fourth joints sub-equal in length, first and fifth also sub-equal, and longer than third; posterior portion of pronotum and base of scutellum transversely wrinkled, the pronotum and scutellum with a distinct, central, carinate, longitudinal line; membrane with the veins very prominent. Length, 20 mm. Breadth of angles of pronotum, 11 mm.

Hab.: Sumatra (Forbes).

Fam. PYRRHOCORIDÆ.

Lohita grandis, Gray, *var. sumatrana*.

This variety differs from typical specimens of Gray's species in having the apices of the intermediate and posterior femora unicolorous and not distinctly red, the discs of both anterior and posterior pronotal lobes black; clavus, excepting base and apex, black; scutellum wholly black; the discal spot on corium, and the coxal spots on sternum, very much larger, and the general colour reddish-ochreous, and not sanguineous.

Hab.: Sumatra (Forbes).

This appears to be a very distinct race, and at first I was inclined to consider it as another species, from the relative lengths of the antennæ and rostrum. I, however, fortunately possess a long series of both sexes of Gray's species from N. E. India, and, to my surprise, find that the lengths of both the antennæ and rostrum are of a very variable nature.

Fam. REDUVIIDÆ.

Panthous cocalus, *n. sp.*

Pale sanguineous, shining; head, rostrum, antennæ, apical angle of corium, apex of abdomen, a spot at middle of intermediate femora, an annulated fascia near middle, and apex of posterior femora, tibiæ, excepting basal third, tarsi, some irregular spots on connexivum (both above and beneath) and membrane, black; disc of posterior lobe of pronotum, about basal third of corium, and disc of abdomen, fuscous; basal joint of antennæ with two pale ochreous annulations, apex of membrane pale fuscous hyaline. The basal joint of antennæ is about half as long again as head, anterior lobe of pronotum sub-prominently tuberculated, posterior lobe with the lateral angles prominently and sub-acutely produced; femora and tibiæ distinctly pilose and nodulated; membrane extending considerably beyond the abdomen.

Length, 29 mm. Breadth of angles of pronotum, 9½ mm.

Hab.: Sumatra (Forbes).

This species is allied to *P. Dædalus*, Stål, and *P. nigriceps*, Rent. It agrees with the first in size, but differs by the colour of the corium,

the annulated posterior femora and the strongly nodulated legs ; it agrees with *P. nigriceps* in the general markings of the corium, but is considerably larger in size, and also differs from that species by the different coloration beneath, the apices of the femora not “*pallidius lurido-flaventibus*,” &c.

Panthous talus, n. sp.

Dull, dark reddish-ochraceous ; connexivum, abdomen beneath, apical thirds of intermediate and posterior femora, intermediate and posterior tibiæ, and apices of anterior tibiæ, tarsi and antennæ, black ; apex of abdomen, apex, and four small rounded spots on margin of connexivum, membrane, and two annulations to basal joint of antennæ, pale ochraceous. The anterior lobe of the pronotum is tuberculated, two tubercles on each side of base being very prominent, posterior pronotal lobe very coarsely rugose, the lateral angles sub-prominent ; legs strongly nodulated and pilose. Length, 20 mm. Breadth of angles of pronotum, $7\frac{1}{2}$ mm.

Hab. : Sumatra (Forbes).

This species is allied to *P. Icarus*, Stål, from which it differs by the colour of the legs, the considerably greater width of the pronotum, the more robust and strongly nodulated legs, &c.

HEMIPTERA-HOMOPTERA.

Fam. CICADIDÆ.

Dundubia Bocki, n. sp.

♂. Head and thorax, above, dull ochraceous or olivaceous ; abdomen, above and beneath, castaneous. Head, with the area of the ocelli, black ; eyes castaneous, speckled with ochraceous. Pronotum with two small black spots at centre of anterior margin, the lateral and posterior margins somewhat paler, the last inwardly and outwardly narrowly bordered with black. Mesonotum with two central, contiguous, obconical spots, their bases situate on anterior margin, the outer margins very pale and bordered outwardly (at base) and inwardly (broadest at apex) with black ; four sub-basal black spots, situate one on each side of the anterior angles of the cruciform elevation, which is somewhat paler. Tympana ochraceous. Head beneath, rostrum, sternum, legs, and opercula ochraceous ; apex of rostrum black ; anterior tibiæ, bases, apices, and a sub-apical annulation to intermediate and posterior tibiæ, fuscous. Tegmina and wings pale hyaline ; tegmina with the veins and costal membrane dull ochraceous, and the claval area inwardly margined with dark fuscous ; wings with most of the veins dull ochraceous, a few being fuscous. The body is elongate ; the head, including eyes, a little narrower than base of pronotum ; the face is prominent and globose, transversely wrinkled, and with a deep and broad longitudinal sulcation on disc ; the rostrum reaches the middle of the posterior coxæ ; the opercula are long, reaching the fifth abdominal segment, they are sinuated and narrowed on each side near base, and at the region of the tympana, and are then widened and rounded on each side, the apex being broad and rounded.

Length, 44 mm. Expanse, 123 mm.

Hab. : Sumatra (Bock).

This species is allied to *D. radha*, Dist., from which it is structurally differentiated by the very much shorter abdomen, and by the broadly rounded apices of the opercula.

Fam. CERCOPIDÆ.

Cosmoscarta Juno, n. sp.

Black, shining; abdomen above, rostrum, legs, a few scattered spots on abdomen beneath, and anal appendage, red; apex of rostrum and femora, excepting bases and apices, piceous; ocelli large and bright shining yellow; eyes dull ochraceous; reticulations on apical third of tegmina distinctly pale and shining brownish. Wings smoky-hyaline. Pronotum thickly and finely punctate, the lateral angles broadly and sub-acutely amplified, the lateral margin broadly amplified and reflexed, the posterior margin truncated at base of scutellum. Tegmina very finely and thickly punctate, the costal margin at base, suddenly and broadly dilated, rounded, and sub-erect, the apical reticulations strongly defined. Legs setose; posterior tibiæ with a strong sub-apical spine on outer margins.

Length, 17 mm. Exp., 50 mm. Exp. of angles of pronotum, 10 mm.

Hab.: Sumatra (Forbes).

This species is allied to *C. viridans*, Guér., from which it differs by the more strongly dilated pronotum, the tegmina with the costal margin suddenly amplified, arched and sub-erect at base, the reticulations of the tegmina not concolorous, the different colour of the abdomen, &c. The tegmina, though shining, are less brilliantly so than in Guérin's species.

East Dulwich: November, 1882.

Coleoptera, &c., at Ventnor.—During a short stay at Ventnor at the end of last April and the beginning of May, I found a few insects: the season was rather further advanced than it has been for some years, but the bad weather prevented much work from being done, besides spoiling the localities for the few fine days that intervened. One fine warm morning I found the large stones on the beach on the west of the town, under and above high water mark, covered with beetles that had come up from the rotting seaweed underneath. *Homalota plumbea* was most abundant, accompanied by *Ptenidium punctatum*, *Phytosus spinifer* and others; unfortunately a cold wind sprung up, and in a few minutes all were gone. On the beach I found two specimens of *Homalota princeps*, a single specimen of *Bledius atricapillus* (which also occurred at Luccombe Chine), and *Bryaxis Waterhousei*, besides other species I have before recorded from the locality. *Lithocharis maritima*, which I generally find in some numbers, was extremely scarce, and *Trechus lapidosus* was represented by a single specimen.

On and about the cliffs, at the roots of plants, several good insects were to be found; the most noticeable of these was *Ceuthorhynchideus Dawsoni*, this was attached entirely to *Plantago coronopus*, and literally swarmed, some plants having 20 or 30 specimens at least on them: they drop immediately the plant is touched and lie motionless; owing to their minute size and the exact resemblance they bear

to the ground underneath, they are very easily passed over entirely, even where most abundant; at roots of *Anthyllis*, *Daucus*, and other plants I also found *Otiorrhynchus scabrosus*, *Orthochaetes setiger*, *Tychius lineatulus*, *Corticaria curta*, *Corylophus cassidioides*, &c. A single specimen of *Baris laticollis* turned up on a wall in the town.

On and about the undercliff *Aphthona venustula* was plentiful on *Euphorbia*, and *Batophila ærata* swarmed on every hawthorn bush. I also took *Thyamis dorsalis*, *Phyllotreta nodicornis*, and other *Halticidæ*, *Pogonochærus dentatus*, *Adimonia sanguinea*, *Sitones ononidis*, *Atomaria fumata*, and others, but nothing like what one might have expected from the locality and time of year.

At Sandown the cliffs had been thoroughly washed by heavy rain, but underneath grass and *débris* at their foot I found a single specimen of *Cathormiocerus socius*, some common *Trachypylæi*, *Oxytelus insecatus*, *Dermestes undulatus* and other species. At roots of *Anthyllis*, a little way up the cliff, I found a single specimen of *Otiorrhynchus ligustici* (thanks to Mr. Blatch, who told me the exact locality). Among *Hemiptera* I found *Coreus scapha* in abundance and two specimens of *Podops inunctus* occurred in an ants' nest: besides *Solenopsis fugax* (recorded *ante* p. 139), the only Hymenopterous insect I noticed, of any consequence, was *Andrena pilipes*.

In a marshy hollow surrounded by willows not far from Brading which I worked for a few minutes, I found several good things, such as *Hypera suspiciosa*, *Plectroscelis subcærulea*, and *Thyamis Waterhousei*. *Cercus pedicularius* was in great abundance: this place looked to me one of the best localities in the island, it is on the left of the road leading from the Roman Villa to Newchurch, about a mile from the former.

Carabidæ were very scarce, all common species, and these occurred sparingly. *Harpalus rubripes*, which is generally a pest, was found with difficulty, and *H. caspius*, *azureus*, and *serripes* occurred almost singly. The *Stenolophi* were represented by one specimen of *S. meridianus*, and the *Dromii* by *Blechrus maurus*: the better undercliff species seemed entirely absent.—W. W. FOWLER, Lincoln: November 15th, 1882.

Coleoptera at Mablethorpe.—The sand-hills which line the Lincolnshire coast at Mablethorpe are, at certain seasons, very prolific in *Coleoptera*. While visiting in that neighbourhood in June, and again in October last, I spent a few days along the coast, and took, among many others, the following *Coleoptera*:—*Hydnobius punctatissimus*, ♂ ♀, this insect is of rare occurrence; *Corticaria Wollastoni* and *crenulata*, *Choleva sericea*, *Stenus subæneus*, *Tachyusa flavitarsis*, *Thyamis suturalis*, *Othius melanocephalus*, *Scaphidema æneum*, *Trechus obtusus*, *Dromius melanocephalus*, *Saprinus metallicus*, *Anomala Frischii*; also one of the rarer *Anisotomæ*, and others not as yet determined.—H. BEDFORD PIM, 2, Crown Office Row, Temple: November, 1882.

Anthicus bimaculatus, Ill., near Liverpool.—It may interest some of the readers of the Ent. Mo. Mag. to know, that I had the good fortune to capture a specimen of the above rare beetle on April 29th last, on the Crosby Sandhills, where it was crawling on the bare sand in a hollow, sheltered from the gale which was blowing a

the time. I was undecided as to its being this species, until it was returned to me as such by the Rev. W. W. Fowler. This species has occurred very rarely at Wallasey, but, as far as I am aware, this is the first record of its capture on the Lancashire side of the Mersey.—JOHN W. ELLIS, 101, Everton Road, Liverpool : November 9th, 1882.

Halictus cylindricus carnivorosus.—The following observations on this apparently abnormal habit of the male of the above species may probably prove interesting to Hymenopterists, as neither Mr. Saunders nor Mr. Bridgman has seen or heard of such before, and I myself, after about forty years' collecting and observing, have never before met with anything of the kind, and can find no record or observation to the effect that *Halictus* or any of the *Anthophila* are carnivorous. At the same time there is nothing, so far as I am aware, in their structure to prevent their catching and mastieating insects, or if not exactly the latter, tearing them to pieces with their formidable pincer-like jaws and sucking their juices, indeed, their oral apparatus would seem more adapted to this mode of living than that of feeding on the pollen and nectar of flowers; be this as it may, so far as I am able to hear, they appear to have confined themselves to the latter kind of food, still it would scarcely seem extraordinary if they did indulge occasionally in some more substantial kind of food, seeing that on both sides of them (according to our arrangements) we have carnivorous groups, whose habits agree in almost every particular, except the choice of food. Carnivorous habits in one of these nectar and pollen eating insects would seem to be abnormal to the group to which it belongs; but are we sufficiently acquainted with the habits of these insects to pronounce that they are really abnormal? All we can say is, that we have not detected them before; and if habits are to go for anything, this fact would seem to connect the aculeate groups more strongly than has hitherto been done. The following are the circumstances which brought the subject of this communication under my notice:

On August 7th of this year, a botanical friend and myself were out for the day on our respective branches of study and collection, on the cliffs and adjoining fields at Scaton, not far from the well-known landslip. We halted for a few minutes on the side of a hill, where there were numbers of flowers, some new to my friend, and there were also numbers of small insects. I was specially on the look-out for *Hymenoptera*. While standing still, net in hand, I caught several *Halicti*, and I may say, that with the exception of a few *Bombi* about the heads of flowers of the large and conspicuous nodding thistle, *Cnicus nutans*, the insects were all *Halieti* and *Diptera*. I did not, to my surprise, see a fossor the whole day. While standing there in the blazing sun, I caught sight of an insect approaching me with something in its mouth; I struck at it and caught it, and, to my surprise and astonishment, I saw it was a male *Halictus*. I did not then stop to make a critical examination, but put him and his mouthful into a pill box; and, not to mix him with the rest of my captures, I put him into a side pocket, that there should be no mistake. The next morning when I came to examine him, I found that I had captured a male *Halictus cylindricus*, with a fly (*Scatophaga*, not described by Walker in his British *Diptera*), a larva of *Acocephalus* (apparently *agrestis*), and three or four *Aphides*. The head of the fly had been mutilated, but the rest of the body was intact; the larva and *Aphides* have dried up, so that I have not kept them, but the fly I have preserved.

Perhaps this notice may elicit, either from our English collectors of this group of insects, or from some Foreign Entomologist, some corroboration of this, so far as I am aware, single instance of one of this section of the Aculeata being carnivorous.

While on the subject of abnormal (?) peculiarities of bees, I may mention that I have made special observations on *Anthophora acervorum*. A pair, or at most, so far as my observations go, two pairs, had taken up their abode in a cob-wall at the end of my garden. I began to notice them in 1863, and have noted the time of their appearance in our meteorological register each year since that time to the present, with the exception of one year (1878), when I did not see them at all for the whole season. The next year, however, a pair took up their abode in the same place, and have continued since. With the one break mentioned above, the male has always put in an appearance about a week before the female; thus, for 19 years, this law has held good, but this year it was broken, for the female preceded the male by a week—she appeared on March 9th, and the male came out on the 15th.—EDWARD PARFITT, Exeter: November 6th, 1882.

Hoplisis bicinctus, Rossi, near Plymouth.—On the 1st August last, between Bickleigh Bridge and the Railway Station, I had the pleasure of taking two females of this rare Hymenopterous insect. It differs, however, from Mr. Smith's description, in having the fuscous portion of the flagellum extended on to the last apical joint; in having on the scutellum a yellow line, instead of two spots; on the first segment of the abdomen two egg-shaped spots broadly united and covering the upper-surface and nearly the whole of the sides (in fact, it would be better described as a band), instead of two triangular spots; the broad yellow band on the second segment is continued across the venter, the narrow band on the third is not continued across the venter, but is represented by a dot on each side and two in the centre, in one specimen, in the other the central dots are wanting. Mr. E. Saunders describes this insect with two spots on the first segment, and length 11 mm., these are respectively 9 and 9½ mm.—G. C. BIGNELL, Stonehouse, Plymouth: 14th November, 1882.

Error as to fig-insect from Ficus religiosa.—As accuracy is always desirable, even in minor matters, I beg to point out that in the Report of the Proceedings of the Entomological Society of September 6th, which appeared in the last part of the Ent. Mo. Mag. (p. 144), the fig-insect from Calcutta, referred to as described by me on that occasion, was obtained from the *Ficus indica*, and not from the *F. religiosa*, as stated in that report. Both sexes were forwarded to me, with the figs, by Mr. J. Wood Mason, to whom I have dedicated the species under the name of *Eupristina Masoni*. The female is very remarkable, having a duplex serrate appendage attached to the base of each of the mandibles and exarticulate therewith, the one series furnished with nine teeth, and the other with seven, side by side with each other and connected together at their base. The wings are also entirely different from any allied species. The Australian species from *Ficus macrophylla* has a very long serrate process attached in like manner, consisting of thirty teeth in a single series, closely resembling a carpenter's hand-saw, the large hooked mandible representing

the handle. I have named this curious species *Pleistodontes imperialis*. The same species has since been obtained from an evergreen *Ficus*, said to be the *F. australis*.—SIDNEY S. SAUNDERS, Gatestone, Upper Norwood: November 14th, 1882.

Notes on the Lepidoptera of Heligoland.—The little British island of Heligoland, in the North Sea, has of late acquired more notoriety from scientific than from political considerations. It has proved to be a sort of half-way house at which the migrations, &c., of European birds can be studied with advantage, and from this cause it has been visited by many of the most noted European Ornithologists; moreover, it has a resident Naturalist in the person of Herr Gätke, who has done much, by his industrious observations, to draw attention to the peculiar ornithological conditions of the islet. Its fame in this induced Baron de Selys-Longchamps to visit it in September, 1880, and being also an Entomologist, he naturally sought and obtained such entomological information as was available. The ornithological results of his visit have been published in the Bulletin de la Société Zoologique de France, vol. vii (1882). To this paper he appends his entomological notes (*Lepidoptera*), and as these are likely to be overlooked by Entomologists, in consequence of the medium of publication, we think it well to call attention to them here. Butterflies (as well as birds) are often migratory, and who knows but that some “undoubtedly British” examples—say of *Vanessa Antiopa*—may have called in at Heligoland *en passant*! The extent of our small possession may be realized by Baron de Selys’ own words. He says: “J’ai fait le tour complet de l’île en une heure environ;” and he adds, “Je ne vis que fort peu d’insectes (il est vrai que la saison était trop avancée), seulement quelques *Vanessa urticae*, *Pieris rapæ*, et les *Libellula vulgata* et *scotica*. Je me demande où vivent les larves aquatiques des Odonates, car il n’y a ni marécages, ni ruisseaux, et l’on n’a d’autre eau dans l’île que celle des citernes et d’un puits.”

But Herr Gätke possesses a collection of the *Lepidoptera* of the island, and in it Baron de Selys noticed the following:

**Papilio Machaon* and *Podalirius*; *Aporia crataegi*; *Pieris* **rapæ*, **napi*, and **brassicae*; *Leucophasia sinapis*; *Colias Palæno*, *Hyale*, and *Edusa*; **Gonopteryx rhamni*; *Polyommatus phlæas* and *Hippothoë*; *Lycæna Acis*, *Arion*, and *Alexis*; *Apatura Iris*; *Limenitis Sibylla*; *Vanessa polychloros*, **urticae*, **Io*, *Antiopa* **c-album*, **Atalanta*, and **cardui*; *Argynnis Dia*, *Lathonia*, *Aglaia*, and *Paphia*; *Melitæa Didyma*; **Satyrus Semele*; *Melanargia Galatea*; *Pararge Mæra*, *Megæra*, and *Ægeria*; *Cæonympha Pamphilus*, *Davus*, and *Iphis*?; *Epinephile Janira*, *Tithonus*, and *hyperanthus*; *Hesperia comma*.

Those species to which an asterisk is attached are found nearly every year; the others are only found occasionally (“très accidentellement”).

The following *Sphingidæ* were also noticed, viz.: *Sphinx ligustri*, *convolvuli*, and *pinastri*; *Deilephila galii*, *euphorbiæ*, *Elpenor*, *porcellus*, and *celerio*; *Smerinthus ocellatus*, *populi*, and *tiliæ*; *Macroglossa stellatarum*; *Zygæna Minos*.

Amongst the *Bombyces* was observed the variety of *Spilosoma lubricipeda* known in British Collections as *radiata*, which appears to have become nearly extinct in England.

On two occasions Herr Gätke has taken *Margarodes unionalis* in his garden, reminding one of its occasional sporadic occurrence in England.

Many other *Lepidoptera* must occur (some, indeed, have been recorded in other publications), but the list of Butterflies and *Sphingidæ* is probably tolerably complete. And it is suggestive, inasmuch as many of the species must, of necessity, be migrants. *Zygæna Minos* in Heligoland appears almost incredible, and we might say the same as regards *Colias Palæno*.—EDITORS.

New food-plant for Bombyx quercus.—In the middle of May, observing a small Portugal laurel to be much eaten I looked for the cause, and found a half-grown larva of *Bombyx quercus* on one of its branches. I conveyed it to the house and supplied it with leaves of the same plant. I, after that, introduced it into its feeding cage daily, together with sprigs of whitethorn; but on every occasion have found the laurel eaten in preference to the other plant. Latterly I supplied it with nothing else and it continued healthy and grew well until the 22nd of June, when it became full-fed, spun a cocoon, and changed to the chrysalis state. Thus it remained until the 17th of August, when a fine male imago emerged.—OWEN S. WILSON, Carmarthen: November, 1882.

Notes on the season in West Norfolk.—Like many others, I, too, complain of the scarcity of *Lepidoptera*, and especially of *Macro-Lepidoptera*, this season. Several species failed to put in an appearance at all, and others were not observed in their usual numbers. From the very first this scarcity of *Lepidoptera* began to manifest itself. Even the generally common *Hibernia rupicaprararia* was quite a rarity, and sallow-bloom seemed almost to have lost its attractive powers, so few were the insects observed at it. As the summer advanced, more species were necessarily met with, but many of them in very limited numbers; the *Eupitheciæ* being especially scarce, and generally late in their appearance. *Eup. pygmæata* I did not see at all, and amongst the few Macros which have been as abundant as usual I note *Coremia quadri-fasciaria*, which species seemed to be well distributed and moderately common on tree-trunks in and near woods; *Melanippe unangulata* and *Macaria liturata* have been commoner than I have ever before observed them; *Larentia didymata* was everywhere a pest, and, in some places, *L. pectinitaria* was nearly as plentiful. Sugar, although repeatedly tried, proved of little use; even common *Noctuæ*, such as *Noctua triangulum* and *N. brunnea*, were only represented during the season by single specimens, notwithstanding the abundance of larvæ of these species in the spring. A day on the coast in July resulted in my boxing three specimens only of *Anerastia Farrella*, but, perhaps, I ought not to complain much of this, as the weather was anything but favourable for coast work. *Stathmopoda pedella* turned up in plenty among some old alders, but it was excessively local, being confined to a few trees only. Of *Tortrix Lafauriana* I again secured a fine series, with some curious varieties. Two specimens have the costal blotches united, so as to form one long blotch on the costa. I also succeeded in breeding the species from larvæ feeding between united leaves and shoots of *Myrica gale* (bog myrtle). Two specimens of *Retinia turionana* were dislodged from Scotch fir, and eventually boxed, also a solitary specimen of *Phleodes Demarniana* flying out of a birch tree met with a similar fate. This specimen occurred some three or four miles from where the last specimen was taken, so that I hope yet to find a spot in which it can be taken more

plentifully. A fine series each of *Phoxopteryx uncana*, *P. siculana*, *P. biarcuana*, *P. inornatana*, and *Phlaeodes immundana* were obtained, with a few specimens of *P. diminutana* and *P. Mitterpacheriana*, but only a single specimen of *Catoptria juliana*. *Crambus hamellus* and *C. latistrius* turned up in plenty, and *Ephestia pasulella* swarmed on the premises of the King's Lynn Dock Company. Larvæ of *Geometra papilionaria* were found on the young shoots of birch in the spring, and a larva, also from birch, produced a fine specimen of *Phycis betulella*.

In conclusion, although I was fortunate enough to take a few good species in considerable numbers this season, the fact still remains that many species which, as a rule, are of annual occurrence here, have been either absent or comparatively scarce. —EDWARD A. ATMORE, 8, Union Street, King's Lynn: October, 1882.

Notes on the larva of Lemmatophila phryganella.—While searching for *Tortrix* larvæ in Canaston Wood last July, I found larvæ of *Lemmatophila phryganella* rather commonly, and as the notices of this species in our books are rather brief, I think that details may be interesting.

It seems to prefer woods, though often found in the open country, and I found that the larvæ were principally confined to oak bushes situated *under oak trees* in the woods, so that they had plenty of shade.

The larva, when full grown, is about the size of that of *Peronea hastiana*, and not unlike it, moderately active, nearly cylindrical, but with the second segment smaller than the head. Colour semi-transparent yellowish-white, with a delicate powdery-looking efflorescence. This shows more especially at each division of the segments where there is a fold of the skin. Head chestnut or dark brown, with the margin and jaws darker, dorsal plate freckled with brown, anal plate hardly visible, spots invisible, but hairs rather long and delicate. Anterior-legs whitish, the third pair having each a very singular, shining, semi-transparent tubercle on the outer side, which gives the larva the appearance of having two long bladdery legs. Professor Zeller (Isis, 1846) says that this peculiarity is confined to *male* larvæ. It may be so, but I certainly did not notice its absence in any of my larvæ.

Feeding between leaves of oak united flatly together, eating the inner surface of each leaf in patches, deserting its habitation without apparent cause, and joining together other leaves, and partially gnawing them in the same manner, causing the disfigured leaves to be very conspicuous. When full-fed, it lines a portion of the space between two leaves with shining whitish silk, making a tolerably commodious habitation or cocoon, and there becomes a chestnut-brown pupa, at about the end of July.

My first (a male) appeared on September 30th, the rest (both sexes) from time to time through October. Before November, all had emerged; as the latter is the month in which this species principally flies, I presume that they were slightly *forced*, not, of course, by *heat*—since the species waits for *cool* weather—but by the indoor protection from wet and wind.

I see that Professor Zeller also gives October as the time of emergence. He also describes the ♂ larvæ as having the head and dorsal plate *black*, the ♀ *brown*. This distinction must have been, I presume, in young larvæ. I did not observe it. —CHAS. G. BARRETT, Pembroke: 16th November, 1882.

NOTES ON NEW BRITISH COLEOPTERA SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(continued from p. 126.)

[Owing to a mistake, the words "flown across the channel" were applied, on p. 122, to *C. auratus*, instead of to *Calosoma sycophanta*, a few lines down; I am sorry that so obvious an inversion escaped notice.]

HYDROPHILIDÆ.

PHILHYDRUS SUTURALIS, Sharp.

This species is allied to *P. marginellus*, Thoms., but is larger, with yellow palpi; the clypeus has a yellow spot on each side in front of the eye, and the elytra are dull testaceous, with the suture black. It appears to be very common both in England and Scotland, and collectors will probably find that most of their *P. marginellus* belong to this species, if they examine them; in *P. marginellus*, Thoms., the elytra are of a browner colour, the thorax is darker, the head black and unspotted, and the last joint of the palpi black (Ent. Mo. Mag., ix, 153; Ent. Ann., 1873, 22). There is very great confusion with regard to the synonymy of *P. marginellus*.

Helochares punctatus, Sharp.

This species can hardly be separated from *H. lividus*, Forst.

Anacæna variabilis, Sharp.

This appears to be considered on the continent a variety of *A. limbata*; it is, however, a very good species, and may be distinguished at once by its long oval shape, which is entirely different from that of *A. limbata*. I have taken it in numbers in the New Forest, unaccompanied by the latter species.

HELOPHORUS TUBERCULATUS, Gyll.

This insect may be easily distinguished by its deep black colour, and by the polished tubercular elevations on the second, fourth, and sixth interstices of its uneven elytra. Taken in the Manchester district by Mr. Clappell, and in Yorkshire by Mr. T. Wilkinson (Ent. Mo. Mag., xi, 135, 235).

HELOPHORUS ÆQUALIS, Thoms.

Allied to *H. aquaticus*, but smaller, with the sides of the thorax less rounded, and its surface less closely granulose; there are also other differences, but it would seem very difficult to separate the species from *H. aquaticus*, of which it appears to be a small variety. It appears to be common, and to occur with this latter species. I have taken it at Repton, and near Lincoln (Ent. Mo. Mag., xi, 39).

HELOPHORUS BREVICOLLIS, Thoms.

Said to be allied to *H. granularis*, but distinguished by the sulci of the thorax, and by the elytra being narrower and more pointed at the apex, and having the sides more parallel; the punctures in the striae on the elytra are finer and closer, and the interstices between the striae are much narrower and more elevated. Taken at Killarney by Rev. T. Blackburn (Ent. Mo. Mag., xi, 39). I have a Scotch specimen named as *H. brevicollis* for me by M. Brisout, which appears to be very close to *æneipennis*.

HELOPHORUS PLANICOLLIS, Thoms.

Allied to *H. æneipennis*, but rather narrower, with the sides more parallel, and the thorax (as its name implies) flatter; the punctures in the striæ on the elytra are finer and closer, and the interstices are flatter, and a little narrower. Taken in the mountainous districts of Scotland and Ireland, and also in the Shetland Isles (Ent. Mo. Mag., xi, 39).

HELOPHORUS LATICOLLIS, Thoms.

Also belonging to the *æneipennis* group, but distinguished by its broad thorax, which is as wide as the elytra, by its elytra being not dilated behind the middle, but thence narrowed towards the apex, with very strong, almost crenate, striæ, with narrow interstices, and by the long, and sometimes entirely black, apical joint of its maxillary palpi. This very distinct species has been taken in some numbers at Woking, by Dr. Power (Ent. Mo. Mag., xi, 40).

HELOPHORUS STRIGIFRONS, Thoms.

A well-marked species, incapable of being confused with any other except *H. æneipennis* and *H. planicollis*, from both of which it differs in being a little larger, in having the sides of the thorax more regularly rounded, in the broad reflexed margin of the elytra, and in having the longitudinal fovea on the base of the head uniformly narrow. It is probably common (Ent. Mo. Mag., xi, 40).

Sphæridium marginatum, F.

The characters assigned to this species hardly suffice to separate it from *S. bipustulatum*, F., of which it appears to be a variety.

STAPHYLINIDÆ.**LEPTUSA TESTACEA**, Bris.

This species rests as British on a single example taken by Mr. Champion out of sea-weed at Whitstable, Kent. It is described as being long, linear, flattened, testaceous in colour, with dark abdomen, very short elytra, and long antennæ. When alive, it has much the general appearance of *Phytosus balticus* (Ent. Mo. Mag., ix, 5).

ALEOCHARA VILLOSA, Mann.

This insect very much resembles *A. grisea*, Kraatz, in general appearance; it appears, however, to come nearer to *A. lanuginosa*, Gr., than to this last mentioned species: it differs in having the 2nd and 3rd joints of the antennæ equal in length; in being flatter, more parallel, and much less shining; and also in the punctuation of the abdomen. Taken in several localities, Newcastle, Braemar, &c. (Ent. Mo. Mag., vii, 275).

ALEOCHARA HIBERNICA, Rye.

This species rests entirely on a single specimen found by Mr. Champion on the top of Slieve Donard (a mountain 2800 feet high, in Co. Down, Ireland). It is of the size and somewhat of the build of *Homalota cambrica*, Woll., but darker, more convex, elongate, and shining, less closely punctured, with shorter antennæ, &c. Its general appearance is not that of an *Aleochara* at all, but it has its anterior tarsi 5-jointed (Ent. Mo. Mag., xii, 175).

Homalota egregia, Rye.

This species, which was introduced on a single specimen taken by Mr. Champion at Caterham, has apparently been since abandoned, as being synonymous with *H. rufo-testacea*.

HOMALOTA DIFFICILIS, Bris.

Near *H. vilis*, Er., but smaller, with shorter thorax and paler antennæ. Taken by Mr. Champion at Staines, Lee, and Arundel, and by Mr. Rye near London (Ent. Mo. Mag., viii, 247; Ent. Ann., 1873, 23).

Homalota æneicollis, Sharp.

This insect can hardly be separated as a species from *H. xanthoptera*, Steph.

HOMALOTA HUMERALIS, Kraatz.

This insect is described by Dr. Sharp as being very near *H. sodalis*, Er., but smaller, with paler elytra and antennæ, and different ♂ characters. Taken by Professor McNab, at Cirencester (Ent. Mo. Mag., viii, 247).

HOMALOTA ATRATA, Mann.

Most nearly allied to *H. gagatina*, Band. (*variabilis*, W. C.), but rather smaller, shorter, and broader, with the abdomen thickly and finely punctured all over the upper surface. Five specimens taken by Mr. Champion in a marshy place near Lee (Ent. Mo. Mag., viii, 247).

HOMALOTA FIMORUM, Bris.

Very near *H. cinnamoptera*, Thoms., but smaller, darker, rather more sparingly punctured, and with shorter antennæ. Taken by Mr. Crotch, according to Dr. Sharp's belief, in Norfolk (Ent. Mo. Mag., viii, 247).

Mr. Matthews has lately been revising the genus *Myllæna*, and three or four species will have to be added to the British list: the descriptions will appear in his essay on the genus.

Mycetoporus longulus, Mann., and *Mycetoporus lepidus*, Gr.

These species are apparently again united by some continental authorities, and are classed as synonymous with *Mycetoporus brunneus*, Marsh. They seem, however, to have sufficient characters to separate them as species.

Mycetoporus longicornis, Kraatz.

It seems very doubtful whether the characters assigned to this species are sufficient to separate it entirely from *Mycetoporus splendidus*, Grav. It is the var. 2 of this latter insect mentioned by Erichson (Gen. et Spec. Staphylinorum, p. 287).

Quedius fulgidus, Grav.

This species is divided by Thomson into five distinct species, which will be found fully discussed by Mr. Rye in Ent. Ann., 1869, 27. They are as follows:—

Quedius 4-punctatus, Thoms.—Distinguished from the others by having two oblique

punctures on each side of the disc of the thorax, by its elytra not being longer than the thorax, and by the 6th ventral segment of its abdomen having four setigerous punctures on each side before the apex. Mr. Rye considers this a good species.

Quedius temporalis, Thoms.—This is the most common form: it is very variable in colour, but never exhibits the deep black body and bright red elytra of the preceding species (in fact, these two species in this point bear a strong analogy to *Mycetoporus longulus* and *lepidus*); its thorax is shorter, with its disc unpunctured on each side; its elytra are longer than the thorax, and the 6th ventral segment has only three setæ on each side.

Quedius fageti, Thoms.—This form is deep black with pitchy-red tarsi, and is distinguished from *Q. temporalis* by its shorter antennæ and elytra, and by other minor differences. It appears to be the smallest of the forms. I have taken several specimens under bark of a decayed oak near Ulting, Essex, in company with *Q. scitus*, and they all seem to exactly resemble each other, although I cannot but think that they are merely a variety of the ordinary form.

Quedius brevicornis, Thoms.—This form appears to be the most distinct, and to have the best claim to rank as a species; the very transverse sub-apical joints of its antennæ, the non-punctured sides of the thorax, and the very prominent temples of its sub-globose head, which are not punctulated, seem to give it more value than a mere variety.

Quedius puncticollis, Thoms.—This insect resembles *Q. brevicornis* in colour, being shining black, with bright red elytra; it appears to be closely allied to this species, from which it chiefly differs in the punctures of the head. I have taken the species in Sherwood Forest by sweeping.

It is very difficult to know what to do with these five forms, whether to class them as separate species, or to reckon them all as varieties of *Q. fulgidus*. To add to the confusion, some continental authorities have revived the *Q. mesomelinus*, of Marsham, of which they make *Q. temporalis* a synonym. The punctuation of the thorax, too, does not always appear to be constant, and specimens seem occasionally to be found with one elytron red and the other black. What is to be done with these insects is, of course, more or less a matter of opinion. At all events, *Q. brevicornis* seems to have specific value.

Quedius rufipes, Er., = *Quedius semiobscurus*, Marsh.

QUEDIUS SEMIÆNEUS, Steph.

This species, however, which was accidentally omitted by Dr. Sharp from his catalogue, is the same as *Q. semiobscurus*, Er. It is a very well marked species, distinguished from *Q. attenuatus*, Gyll., which it much resembles, by the four longitudinal interrupted bands of ashy pubescence on the abdomen (Ent. Ann., 1863, 80).

XANTHOLINUS GLABER, Nordm.

This species, which was also accidentally omitted by Dr. Sharp, ought to be inserted after *X. glabratus*, Grav.

Scopæus Ryei, Wollaston.

This species was found by Mr. Wollaston at Slapton Ley, Devonshire, under stones near the sea, in 1869 and 1872. It differs from *S. minutus*, Er., in being smaller and narrower; its colour is paler, or more reddish-brown, and its surface more opaque; its legs are thinner, and its abdominal segments less strongly divided. In Mr. Mason's notes before referred to, I find one to the effect that *S. Ryei*, Woll., = *S. subcylindricus*, Scrib. Mr. Rye (Ent. Ann., 1874, 82) says that these two species are not synonymous.

LITHOCHARIS PICEA, Kraatz.

This insect is easily distinguished from all our other species by its dark pitchy colour (with elytra rather lighter), and ferruginous legs and antennæ. It must be placed after *L. brunnea* in our list). Taken by Mr. Champion in Bexley Wood, Kent, 1872 (Ent. Mo. Mag., ix, 156).

Lithocharis tricolor, Marsh.

Was, by a misprint, placed as a separate species in Dr. Sharp's catalogue, as he points out in Ent. Mo. Mag., viii, 84; it is synonymous with *L. propinqua*, Bris.

COMPSOCHILUS PALPALIS, Er.

This genus comes very near *Acrognathus*; *C. palpalis* may, however, be very easily distinguished from *Acrognathus mandibularis* by its much smaller size (Ent. Mo. Mag., viii, 37; Ent. Ann., 1872, 59).

Deleaster dichrous, var. *LEACHII*, Curt. (= *adustus*, Bielz).

This variety has the elytra strongly infusate at the apex: it seems confined to the northern part of England, and to Scotland. The southern specimens appear all to belong to the type form (Ent. Mo. Mag., viii, 15).

Acidota cruentata, Mann., var. *FERRUGINEA*, Er.

This variety differs from the type in being smaller, narrower, with very markedly shorter elytra, of which the punctuation seems more confused. Taken by Mr. Lawson near Scarborough (Ent. Mo. Mag., ix, 190). This variety certainly looks like a good species, and if it is to be kept as a variety, there are several other species that might be sunk with quite as good reason.

Olophrum consimile, Er. (*Omalium consimile*, Gyll.).

Distinguished from our other two species by its narrower build, its thorax being sinuate at the sides behind the middle, and its longer elytra. Taken by Dr. Buchanan White at Braemar, 1871 (Ent. Mo. Mag., viii, 73; Ent. Ann., 1872, 60).

Eudectus Whitei, Sharp.

The genus *Eudectus*, new to our list, comes very near *Coryphium*: the strongly angulated sides of *E. Whitei* will, however, serve at once to distinguish it from

Coryphium angusticolle, which is the only British species that it resembles. It seems very probable that *E. Whitei* is only a dark northern form of *E. Giraudi*, Redt. A single specimen was taken by Dr. Sharp on the summit of Ben-a-Bhuird, Braemar, in June, 1871 (Ent. Mo. Mag., viii, 73; Ent. Ann., 1872, 61).

Homalium brevicorne, Er.

This species (introduced as British by Rev. A. Matthews, Zool., 8650 [1863]) has given rise to considerable discussion: it appears to be regarded by some continental entomologists as a variety of *H. vile*, Er. Mr. Matthews, however, considers it a thoroughly good species, and says that it is readily distinguished by its shorter and more robust antennæ, of which the second joint is largely incrassated, its shorter and more rounded thorax, and more distinctly striated elytra.

HOMALIUM TESTACEUM, Er.

This insect comes close to *H. vile*, Er., in our list: it differs, however, from this species in its more remote punctuation, and in its pale rufous colour: it also has a short, smooth, shining ridge on the hinder part of the disc of the thorax. Taken by Mr. Matthews near Gumley, Leicestershire (Ent. Ann., 1864, 62). This insect has been omitted from the British list, but is, I think, certainly a good species.

(To be continued).

HINTS AS TO THE BEST MEANS OF REARING LARVÆ OF
TORTRICIDÆ.

BY CHAS. G. BARRETT.

For some years I have occupied myself, as far as circumstances would permit, in working out the life-histories and describing the larvæ of our British Tortrices, and, thanks to the kind help of friends in different parts of the country, have had opportunities of examining a great many species, some of them of extreme interest. In many cases these larvæ have been by no means easy to rear, from peculiarities in their habits or dispositions, and I, therefore, think that a few remarks on the peculiarities of Tortrix larvæ and the best modes of rearing them may be interesting.

There is no great difficulty in rearing the leaf-rolling species of the genera *Tortrix*, *Loxotænia*, and part of *Pæcilochroma* (of Wilkinson's "Tortrices" and Stainton's "Manual"), nor those which draw together leaves either flatly or by folding or spinning several together, such as *Peronea* and its allies, *Phlæodes*, *Pædisca*, *Coccyx*, &c., because they mostly feed on the comparatively dry and firm leaves of trees or bushes, and are in consequence but little subject to the annoyance of mouldy food. All that is necessary is to put the rolled, twisted, or joined leaves containing the larvæ into large tins or gallipots, closely tied down and covered with glass, and to open them daily for ventila-

tion, supplying fresh food when necessary. Particular care, however, must be taken never to introduce any food in a damp state, from either dew or rain, or mould will be the immediate result. These species will spin up among their food-plant and emerge in many cases in a fortnight, in all cases within the same season. The few species in these groups, such as *Tortrix icterana* and *viburnana* and *Ænectra Pilleriana*, which generally feed on succulent low-growing plants, should have plenty of air, not being covered with glass unless the food begins to wither, such plants becoming very quickly rotten if covered closely down. This is also the case with the curious balls of young bramble leaves twisted up by the larva of *Notocelia Udmanniana*.

In the case of the very numerous species which feed in the shoots of shrubs and low plants eating out the young leaves, such as the larger species of *Antithesia*, *Hypermezia*, *Brachytania*, *Pardia*, *Spilonota*, *Hedya*, *Steganoptycha*, parts of *Paramesia*, *Semasia*, and *Pæcilochroma*, much judgment must be used. Where the shoots are of hard-leaved bushes and plants and the larva does not pack its domicile with frass, tins or gallipots may be used and covered with glass, or wholly or partially uncovered as seems necessary from the state of the weather or the condition of the food, but shoots of soft-leaved low-growing plants, and those which, as in the case of *Steg. nævana*, are apt to be full of frass, should be put into ordinary rough flower-pots and tied tightly down with calico, old lining, or any close-textured material that comes to hand. These pots allow a good deal of evaporation, and if dry moss is introduced it will also absorb some of the superfluous moisture, so that glass may be laid either completely or partially over these also to keep the food from withering, but it must be frequently removed and the food stirred up and examined and prevented from becoming mouldy or rotten. The same should be done with larvæ of *Sericoris*, some of which feed in flower-spikes as well as young shoots, and are, therefore, still more liable to injury from mould or decay. But of all the low-plant feeders the most difficult by far to rear are the *Sciaphilæ*. It is hardly possible to keep the solid composite flowers in which *perterana* and *ictericana* feed from becoming mouldy, and the larvæ do not willingly move to fresh flowers. Perhaps the best plan is to tie up the infested flowers with others in close bunches, so that air can get round them and then tie them down in flower-pots. The shoots and curved leaves in which *virgaureana* and other species feed can only be treated as before described. But the difficulty of keeping the food in good condition is as nothing compared to the difficulty of keeping the larvæ in any sort of confinement. They seem beyond

measure impatient of imprisonment, and as soon as they discover the least closeness in the air or change of condition in the food, begin to wander round the vessel, and try by every possible means to escape. If it is not very tightly tied down they force their way under the string, perfectly indifferent to a squeezing that while in operation completely flattens them, and if the string is too tight they will force their way between the covering and the pot or into the smallest fold and there die after reducing themselves to the thickness of brown paper. To frustrate their efforts the covering must be of strong calico or cloth, and must be tied down with *thin* string which must be wound five or six times round the pot and *strained tight at each round*, and the covering material then pulled tight. No larva can then force its way under the string and they cannot easily get between the calico and the pot, but to completely prevent this the best plan appears to be to rub a little lard or other form of grease round the edge of the pot. This they detest and will not willingly touch, and it *does* seem to circumvent them. If by these devices the larvæ can be compelled to remain in the pot, they will spin up among the food-plant or in the moss, but so much sulkiness remains in their disposition that the moths, on emerging, will often remain among the rubbish at the bottom until spoiled. The best plan is to examine the food and pick out the pupæ, which do well if placed on soft material in a chip or card box. If, however, when full-fed the larvæ are allowed to force their way with difficulty out of the pot they appear quite satisfied, and will spin up in the first available place; so that I have obtained numerous pupæ by simply laying a squeezed-up piece of gauze or leno, or even some dry moss, loosely on the top of the pot.

There are a very few leaf-feeders such as *Stigmonota Weirana* and *nitidana*, which hibernate in a cocoon between the leaves on which they have fed. These give little trouble and only require to be kept cool.

The species of the genus *Retinia*, which feed in fir-shoots, are tolerably easy to rear if the shoots are not allowed to get too dry, as they do not readily become mouldy, and the larvæ will move freely to fresh shoots. A common flower-pot covered with glass is the best for them.

Some of the species of *Anchylopera*, which feed on the leaves of shrubs and make themselves domiciles in which to pass the winter, are rather difficult to rear, and must have winter exposure, but those which feed in early spring on clover, &c., are easily managed.

Except the *Sciaphila*, no *Tortrix* larvæ are so hard to rear as the

various groups of seed-feeders. There certainly are exceptions, such as *Antithesia gentianana* and *marginana*, *Asthenia strobilella*, and *Eupæcilia roseana*, which obligingly remain in their respective seed-heads all the winter, requiring only to be kept cool and not too dry, and not even needing to be wintered out of doors. The feeders on Papilionaceous seeds, such as *Stigmonota orobana* and *dorsana*, after leaving the seed-pods will spin their tough cocoons on rotten wood or calico, and may also be wintered indoors. But it is quite otherwise with the genera *Catoptria*, *Endopisa*, *Carpocapsa*, and parts of *Grapholitha*, *Semasia*, *Eupæcilia*, &c. Most of these feed up with very great rapidity, becoming full-fed almost before the parent moths have ceased to fly—say, within a month or six weeks of the time of the egg being laid—and remain for nine or ten months in cocoon in the larva state, in most cases leaving their food and spinning up among *débris*, or under stones, or other suitable places. Having to arrange for so long a repose it is natural that they should wish to choose a suitable and comfortable spot, but some seem unnecessarily fastidious. All that I have recorded of the restless, obstinate, and suicidal tendencies of *Sciaphila* larvæ applies equally to these. They must be tied down in flower-pots tightly and the covering material strained as already suggested—not omitting to grease the edge—and when they find that they cannot really escape they may generally be tempted to spin up by the introduction of pieces of rotten wood, cork, hollow sticks, folded paper or rag, or the stems of their food plants. Sometimes nothing will give satisfaction, and the larvæ, after sulking for weeks, will actually dry up and die without any material alteration in their appearance. I have known dozens of larvæ of *Catoptria æmulana* to die in this way after leaving their food—the seeds of the golden-rod. On the approach of winter the pots containing larvæ of any of these groups must—the hole in the bottom being first stopped so as to exclude insect foes, but allow drainage—be placed in the open air, exposed to the influences of any weather that may come. It is well to look at them occasionally lest the covering gets rotten and broken, or the pot is rolled over by some active cat, but, making allowance for accidents, larvæ kept in this manner out of doors until the end of April or even into May, will generally produce a fair proportion of moths.

The internal, stem- and root-feeding species require very various treatment. The succulent stems in which the *Halonotæ* principally feed, require to be kept alive in moist earth until the larvæ are full-fed, and care must afterwards be taken that the stems do not ferment

from lying too close together, or dry up before the moths emerge. The species, such as *Grapholitha pupillana* and the *Dicroramphæ*, which feed in the stems of harder plants, also thrive better if the roots are kept in moist earth, and this precaution must of course be taken with the root-feeding *Euchromiæ*, *Orthotæniæ*, and *Xanthosetiæ*. Most of these species are best collected in the spring as the larvæ are slow feeders, and not easily discoverable until tolerably well grown. Most of them turn to pupa in the stems, though *G. pupillana* follows the custom of its allies in wandering away and spinning up elsewhere.

The larvæ of *Antithesia fuligana*, *E. nigricostana*, and several of the *Eupæciliæ* and *Argyrolepiæ*, which feed in the soft stems of low-growing plants, must be collected in the autumn before the dead stems are broken and scattered by the winter storms. The stems must be kept fresh in moist earth until they naturally die down, by which time the larvæ have generally spun up, and the stems may then be kept in pots, jars, or even bottles, care being taken that they do not get either mouldy or too dry, and will do as well in a cool room as out of doors.

Of the larvæ of the few bark, rotten wood, and gall-feeders, I know scarcely anything. They are difficult to find and, I should think, very hard to feed up in confinement, though, if collected when full-fed or in pupa they emerge well enough. I once reared *Asthenia coniferana* from fir bark, but did not see the larva. One larva I did find in the same bark, but am extremely doubtful of its species, and quite sure that *it* was not reared.

Having now made public property of my own small stock of knowledge on this subject, I earnestly appeal to those who may find (known or supposed) larvæ of interesting local or undescribed species, either to communicate to me a description with particulars of their habits, or allow me the opportunity of making it myself.

Pembroke: 17th November, 1882.

ON A SMALL SERIES OF LEPIDOPTERA FROM THE HAWAIIAN ISLANDS.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The present consignment was received last January, but until now I have been so much engaged in working out the large collection of *Lepidoptera* made by Mr. Edmonds, in Chili, and with other almost equally important collections, that I have been unable to examine it.

The first species is rightly indicated with doubt as a *Boarmia*;

for, although congeneric with two Hawaiian species, which I (misled by the appearance of their females) erroneously referred to *Scotosia*, it, nevertheless, belongs to the group of genera confounded under the name of *Boarmia*: under this designation there must be at least three or four good and characteristic genera.

In a collection received from Mr. Blackburn, in 1880, were males of my "*Scotosia*" *rara*, which ought perhaps to have opened my eyes to the fact that this species and *S. corticea* had no business in that genus, but I suppose that, having a name for the species, I failed to examine it critically, and thus perpetuated my error.

These three species, then, will fall into a new genus of *Boarmiidae* which I shall term:—

SCOTORYTHRA, *gen. nov.*

Wings entire; primaries triangular, with straight costal and inner margins and slightly convex outer margin; first and second sub-costal branches emitted close together near the end of the cell; the third, fourth, and fifth branches emitted from below the second at some distance beyond the cell, the third and fourth forming a long fork to apex, the fifth being nearer the cell and, therefore, emitted sooner than the two preceding branches; radials normal, the upper radial being emitted from the anterior angle of the cell, and the lower from the middle of the discocellulars which are transverse and not angulated; the second and third median branches emitted almost from the same point at the posterior angle of the cell; secondaries sub-pyriform, decidedly narrower than in typical *Boarmia*, with slightly undulated outer margin; costal and sub-costal veins lying close together towards the base, so that, to the naked eye, the former appears to be emitted from the latter; the sub-costal simple, passing away from the cell before its extremity, the discoidal area being confined by the continuation of the radial into the sub-costal; discocellular slightly oblique, divided by a strongly defined longitudinal fold; median branches exactly as in the primaries: body rather slender, especially the abdomen of the male, which extends considerably beyond the posterior wings; palpi rather large, coarsely scaled, projecting (as in *Scotosia*) for some distance in front of the head, the terminal joint depressed; forehead conical between but a little below the antennæ; the latter organs very long, especially in the male, plumose from about the basal fifth to the external two-sevenths; thorax rounded, abdomen with well-defined anal tuft; legs long and slender with the exception of the tibiæ of the hind pair which are broad and compressed; tibiæ of second pair terminating in two unequal well-marked spurs.

1. *Scotorythra arboricolens*, *sp. n.*

♂. Allied to *S. corticea*: dark smoky-grey; wings transversely striated with creamy-whitish, but less strongly towards the outer margins, thus leaving a well-defined external border; two central slightly angulated blackish parallel stripes; antennæ white with greyish pectinations; back of thorax and abdomen dark sericeous grey; posterior edges of abdominal segments white; anal tuft testaceous:

under-surface sericeous whitey-brown; wings washed with grey to beyond the middle, where there is a paler discal band followed by a darker external border; the whole surface indistinctly striated with grey; diffused blackish discocellular spots.

Expanse of wings, 39 mm.

"Occurs on tree-trunks at an elevation of about 2000 feet, on Lanai; very hard to catch, as it flies wildly before one can approach near enough to its resting-place, and the ground is almost too rough to attempt pursuit: September."—T. B.

But for its different ground-colour and distinctly striated upper surface, I should have supposed this to be the male of *S. corticea*.

PYRALES.

2. *Scopula litorea*, sp. n.

Sericeous creamy-whitish; palpi very long, curved and deflexed; primaries irrorated with ferruginous, crossed at basal third by an irregularly sinuated black-spotted greyish line; two parallel discal series of black spots forming a wide arch to the first median branch, where they turn outwards at an acute angle and then again transversely to inner margin; discoidal spots ferruginous, ill-defined; secondaries with a spot at the end of the cell and an arched denticulated discal line, dark grey; a second paler grey line nearer to the outer margin; all the wings with a marginal series of minute blackish points, which in the primaries are continued along the costa to the end of the cell; wings below slightly sordid; primaries with the markings indicated in grey; the reniform spot outlined in grey; secondaries with all the markings represented by black dots; otherwise much as above.

Expanse of wings, 14—18 mm.

"Occurs on the sandy sea-shore at a place called Mauna Lea (Lanai), flying over flowers: September."—T. B.

ORTHOMECYNA, gen. nov.

Allied to *Mecyna*, from which it differs in its less prominent eyes, less pointed and loosely scaled palpi; the shorter costal margins to the wings, the less oblique and straighter outer margin of the primaries and smaller secondaries. Type "*Mecyna*" *exigua*.

A second species, having similar structural characters to those of *M. exigua*, being now sent (with additional examples of that species), I feel satisfied that the difference between them and typical *Mecyna* warrant their separation from that genus.

3. *Orthomecyna albicaudata*, sp. n.

Primaries above golden-cupreous; sometimes with an abbreviated irregular blotch representing the central band over the end of the cell from costal margin to median vein, below which it is indicated only by one or two small isolated spots, sometimes wholly wanting; a more or less defined angular blackish lunule on the discocellulars; external area washed with brown, which, however, only becomes dis-

tinged upon the border, which is limited by a sub-marginal series of black-edged dots of the ground-colour; secondaries dark brown, broadly blackish on the outer border and traversed by two divergent longitudinal bright ochreous stripes from the base to the third fourth of the wing; costal and abdominal borders pale, the abdominal area clothed and fringed with long fine hairs; body golden-buff, with white anal segment; legs pearly-white, the anterior pair sordid, above grey, banded with whitish; wings below golden; body below pearly-white.

Expanse of wings, 20—21 mm.

"Occurs on the same ground as 172 (*Scotorythra arboricolens*): apparently rarer, but not difficult to capture. In my small series one specimen has an intense black mark on each wing, representing the indistinct dark blotch on the costa of the front wing of the smaller specimens sent, and I notice some variety in the extent to which the hind wing is suffused with yellow."—T. B.

4. *Orthomecyna exigua*, var. *cupreipennis*.

The primaries sometimes of the usual character, divided into irregular grey areas edged with black and white, with sub-marginal and marginal series of black spots; sometimes uniformly sericeous grey with a marginal series of black spots alone; secondaries pale cupreous with diffused dark greyish external border.

Expanse of wings, 18—20 mm.

"Taken on Lanai, in September."—T. B.

This form, if it be constant to locality, might well be separated specifically from *O. exigua*; for although the pattern and coloration of the primaries is almost identical in some examples, that of the secondaries is wonderfully dissimilar.

MELANOMECYNA, gen. nov.

To this genus I propose to refer my *Mecyna ennychioides* and *M. nigrescens*; they differ from typical *Mecyna*, of which *M. virescens* is the Hawaiian representative in their long-scaled truncated palpi, their sooty-black coloration, and small size, which characters give them the general aspect of *Boreophila*: they, however, differ widely from the latter genus in their narrower and more pointed wings: in neuration they correspond with *Mecyna*.

5. *Melanomecyna stellata*, sp. n.

♂ ♀. General appearance and coloration above of *M. ennychioides* but the wings rather shorter, the inner black stripe of the central belt on primaries edged near the inner margin with ochraceous; the reniform spot represented by a black 3-shaped character; outer black stripe dotted along its outer edge with minute snow-white dashes; marginal black spots separated by minute white points; fringe long, more broadly white-edged than in *M. ennychioides*; eyes much darker; under-surface altogether more uniformly coloured; the discal blackish spots less distinct, not relieved by pale edges; fringe silvery-grey.

Expanse of wings, ♂, 18 mm., ♀, 16 mm.

"Occurs on the mountains of Oahu in October."—T. B.

The receipt of this species in both sexes is satisfactory, since it renders the distinctness of *M. ennychioides* from *Aporodes? micacea* more probable.

GESNERIA, Hübner.

To this genus Hübner referred the broad-winged species with long palpi, usually placed under *Scoparia*: he gave no characters; his description being merely—"The wings marked with an indistinct central spot." The type is *G. centurionalis*.

6. *Gesneria floricolens*, sp. n.

Aspect of *G. mercurella*, Linn., but in coloration nearer to *Hellula undalis*: primaries grey, varied with pale creamy-buff, crossed by three white stripes edged externally with blackish dots; the two outer stripes (representing the limits of the central belt) sigmoidal, enclosing the reniform spot, which is cream-coloured with two black dots upon it; the base and central belt are a little paler than the rest of the wing, the disc being slightly the darkest area; a sub-marginal series of black dots from which small white dashes run outwards to the margin, interrupting a black marginal line; fringe white; secondaries sericeous creamy-white, greyish at apex; fringe snow-white, traversed by a grey line: body sordid cream-colour; head greyish, antennæ brownish; under surface silvery-white; anterior tarsi banded above with grey.

Expanse of wings, 14 mm.

"Two specimens from Lanai: on the sandy sea-shore at Mauna Lea, flying over flowers: September."—T. B.

TINEINA.

7. *Depressaria* sp. — ?

Two examples of a grey species with whitish secondaries; both of them unfortunately destitute of palpi, on which account it appears to me that it is wiser to abstain from naming this insect: it is doubtful whether it really is a *Depressaria*.

"Not rare in September among parched vegetation on the sandy plains of Maui; but most specimens were in poor condition."—T. B.

8. *Azinis hilarella*.

Azinis hilarella, Walker, Cat. Lep. Het., xviii, p. 542 (1863). "I have twice taken this insect, though at long intervals: each time it was apparently attracted by light, but seemed very sluggish, and apparently satisfied to sit and look at the light from a distance."—T. B.

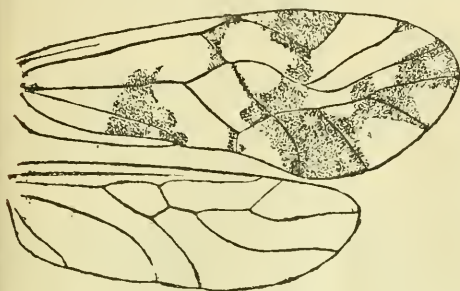
The example sent agrees with three specimens collected by Mr. Hobson, in Formosa: it is, therefore, evident that this species has a very wide range.

REMARKS ON CERTAIN *PSOCIDÆ*, CHIEFLY BRITISH.

BY R. McLACHLAN, F.R.S., &c.

PSOCUS (*NEOPSOCUS*) *RHENANUS*, Kolbe.

On the 30th July, 1882, the Rev. A. E. Eaton was in the Apennino Pistoiese, Central Italy, and was staying at the Villa Marghareta, near San Marcello. In the grounds of the hotel he turned over a large slightly embedded stone in search of Isopods. Under this stone was



a nest of a small ant (*Myrmica* sp.), and in company with the ants were a number of a pretty little *Psocus*, mostly fully winged, but also others (that he did not capture) with undeveloped wings, which prove identical with a spe-

cies recently described (Entomol. Nachrichten, viii, p. 207, August, 1882) by Kolbe under the name *Neopsocus rhenanus*, found by Dr. Bertkau under a stone (apparently *not* in company with ants) in Rhenish Prussia.

The main characters of *Neopsocus*, as distinguished from *Psocus* (restricted), are:—♀ sub-apterous, ♂ with fully developed wings; body clothed with microscopic, thickened, truncate, erect glandular hairs (most numerous in the ♀). In the anterior wings the lower angle of the pterostigma is produced into a very short thickened spur-vein* (to be seen in a greatly exaggerated form in the Indian *Amphipsocus*, McLach.).

The species is an exceedingly pretty little insect, about $6\frac{1}{2}$ mm. in expanse, with hyaline wings, on the anterior of which are fuliginous spots and bands arranged as in the figure; the pterostigma whitish (or yellowish) at its commencement; the neurulation black, partly milk-white.

The Italian individuals have the markings of the wings rather darker than in the only example I have seen from Prussia.

It is probable that *Neopsocus* may be really entitled to generic rank (especially on account of the nearly apterous ♀). In the eight Italian examples before me the neurulation is extremely unstable in minute details (all possess the spur-vein). As to the condition of the discoidal cell, most of them would (on this character) fall

* In the figure here given this is not sufficiently indicated.

into *Psocus* as restricted by Kolbe, others would fall into *Amphigerontia*, Kolbe (one even presenting the condition seen in *A. bifasciata*, Latr.) ; and the form of the posterior marginal cellule is also very variable.

Psocus bipunctatus, L., was once found by Meyer-Dür in numbers under a stone in Switzerland, not in company with ants. It is possible there may be no real connection between the ants and *N. rhenanus* ; but, at any rate, the latter were not molested by the former. Stone-turning will probably become a practice with Entomologists in search of rare and new forms of *Psocidæ*.

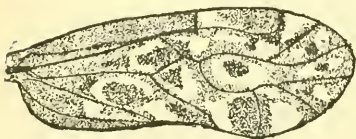
PERIPSOCUS ALBOGUTTATUS, Dalman, & P. PUPILLATUS (Dale), Walker.

Two perfectly distinct European (and even British) species are confused under these names, the names themselves, in their original signification, representing one and the same species.

Some time ago I felt certain we had two species in England, and communicated the materials to Herr Kolbe, who agreed with me. Latterly, in the "Entomologische Nachrichten," viii, pp. 211—212, he separated them as *P. alboguttatus* and *pupillatus*, but in error, and his *alboguttatus* stands in need of a new name. I briefly characterize the two species, with notes, &c.

1. P. ALBOGUTTATUS, Dalman (*pupillatus* [Dale], Walker ; Hagen ; Kolbe: *alboguttatus*, McLach., *olim*, *part.* ; Spångberg: *striatulus*, Steph., *part.*, *sec. collect.*, *nec* Fab.).

Much smaller than the succeeding species, the anterior wings only expanding to



5—5½ mm. The head and thorax darker brown (nearly black in life). Anterior wings very dark grey (nearly black in life) ; in nearly all the cellules and areas the dark ground is represented by a pupillate spot

surrounded by white ; a double sub-apical series of white spots.

Has been taken in England by the late Mr. Dale and by myself ; I found it commonly on the 4th July, 1873, near Weybridge, by beating bushes of *Calluna* that overhung a high bank. Switzerland : I found an example in the Forêt de Pfyn, Canton Valais, on the 10th July, 1882, amongst *Pinus sylvestris*. Rhenish Prussia. Sweden ; according to Dalman and Spångberg. Madeira ; Wollaston.

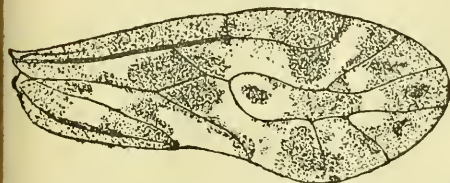
This is undoubtedly Dalman's *alboguttatus*, as is proved by the following words in his diagnosis : "alæ nigræ, maculis discalibus majoribus albis 6, puncto nigro inscriptis, vel sub-ocellatis ; intra marginem apicalem puncta 10 minora alba, duplici serie ordinata." It is also *pupillatus* (Dale), Walker, as represented by the single specimen

from which Walker's diagnosis was taken ; but Mr. Dale subsequently distributed it and the following species under this name, and specimens from him, thus confused, are in the British Museum and in my own collection. In my Monograph in the Ent. Mo. Mag., vol. iii, the two species are apparently confused in the description, but the figure (pl. ii, fig. 8) represents that now under consideration. This species is probably widely distributed, but before any trustworthy ideas on this point can be arrived at, students of *Psocidæ* must re-examine their collections and state the results.*

2. *P. SUBPUPILLATUS* (*alboguttatus*, McLach., *olim*, *part.* ; Meyer-Dür ; Rostock ; Kolbe ; *nec* Dalman : *4-maculatus*, Steph., *part.*, *sec. collect.*, *nec* Latr.).

Larger than the preceding species, the anterior wings expanding to 6—6½ mm.

The head and thorax paler brown. Anterior wings pale grey (often extremely pale) ; a large pupillate spot in the area at the base of the forked vein, but otherwise the cellules and areas are not pupillate ; a single series of large



white spots at the base of the apical cellules and areas ; there is a faintly indicated sub-apical series of darker spots, but they are not enclosed in white spots, and hence are not pupillate.

This is commonly known in collections as *alboguttatus*, and is probably spread over nearly the whole of Europe. It is partial to *Pinus sylvestris*, but may be beaten from almost any tree.

CÆCILIVS OBSOLETUS, Steph.

Kolbe recognises three species as confused under this name, all of which occur in Britain. Below I give a translation of his tabular diagnoses from Ent. Nachr., viii, p. 211.

- a. Body greyish-yellow. Wings yellowish ; posterior marginal cellule moderately large, broad, depressed *obsoletus*, Steph.
 Body brownish-yellow. Wings brownish ; posterior marginal cellule small, broad, scarcely depressed *Burmeisteri*, Brauer.
 b. Body bright pale yellow to reddish-yellow ; posterior marginal cellule very small, elliptical *perlatus*, Kolbe.

I possess all three in my British collection, determined by Kolbe. All are closely allied, yet I think he may be justified in separating them ; but they require to be studied in connection with their habits. There is some difficulty in deciding as to whether Stephens' single type

* The rudimentary sub-costa is incorrectly delineated in the figure here given.

of *obsoletus* belongs to the species indicated by Kolbe under this name, or to *Burmeisteri*. I am not quite satisfied. *Perlatus* is the most distinct-looking of the three. These species frequent *Pinus*, *Taxus*, and *Juniperus*, especially the latter; they should be collected in numbers, and be carefully labelled with regard to locality, &c. Herr Kolbe is an enthusiastic young student of *Psocidæ*, and has done remarkably good work, but some of his deductions will prove ill-based in consequence of too minute subdivision.

ELIPSOCUS UNIPUNCTATUS, Müller.

British Entomologists should examine their specimens of this insect. Kolbe has separated it from *Elipsocus* under the generic term *Mesopsocus*, on certain small characters, the chief of which is that the "forked vein" is sessile at the base of the fork. But *Elipsocus* as defined by him is headed by a species he terms *E. laticeps*, excessively close to *M. unipunctatus*, and differing chiefly in the "forked vein" being shortly petiolate at its base. Since Kolbe's monograph appeared in 1880 I have diligently collected *unipunctatus*, hoping to discover *laticeps* amongst them, but have not succeeded in so doing, although I note considerable variation in the neuration, the smallest exaggeration of which, in some examples, would produce *laticeps* (as defined by neuration only). The fact that the latter apparently does not occur in Britain is in favour of its distinctness; even if it prove to be distinct, there was small necessity for the genus *Mesopsocus*.

CLOTHILLA ANNULATA, Hagen.

This little "book-louse" was described by Hagen in the Ent. Mo. Mag., vol. ii, p. 122 (1865), from specimens found in boxes of "European insects." It has since been found in several parts of Europe, and has been recorded from England in several continental publications, on my authority. But I do not think it has ever been formally noticed as British in a British publication. Seven or eight years ago I noticed three or four examples amongst the mass of small boxes, &c., &c., that adorns (?) the mantelshelf in my study here at Lewisham, but have not observed it since; and of its actual origin I know nothing. It is just one of those insects to which no native country can be assigned. Hagen has seen it in North America, and figures it in the Stettiner ent. Zeitung, 1882, pl. ii, fig. 7.

N.B.—Kolbe considers *Clothilla*, Westwood, only a synonym of *Atropos*, Leach, whereas, according to him, *Atropos* of authors of the present day should take the name *Troctes*, Burmeister. Leach's

characters for his Family *Atropida* (Edinburgh Encyc., vol. ix) were simply "tarsi three-jointed," and the type of his genus *Atropos* is "*lignaria*," with the citations "*Termes pulsatorium*, L.," and "*Termes lignarium*, De Geer." On this evidence I am inclined to think Kolbe may be justified in the view he has taken, but such a change is exceedingly inconvenient. The insect described by De Geer and Linné is certainly that which we now term "*Clothilla pulsatoria*." *Troctes* of Burmeister is also certainly identical with what we term *Atropos*. I believe Kolbe's views will have to be adopted.

Lewisham, London :

December, 1882.

Notes on certain captures during the past season in the Forest of Dean.—Out of fifteen successive seasons I cannot recall one in which the months of May, June and July yielded so small a harvest to the working Lepidopterist. And this is the more surprising, because, in the preceding year, examples of the commoner species that frequent this district were easily obtainable, and most of them abundant. But although larvæ were then so numerous here, observations made at the time led me not to expect more than a normal number of imagoes from the devouring host, for destroyers of one kind or other were as ubiquitous as their victims, and the traces of their handiwork quite as apparent. Nevertheless, certain early spring moths proved to be plentiful, so that, when noticing frequently on the oak trunks during February, March, and the first fortnight of April, *N. hispidaria*, *P. pilosaria*, *H. progemmaria*, *H. leucophæaria*, I little thought that, at the close of 1882, my list of captured *Lepidoptera* would turn out to be such a small one. This, however, is the case. Since mid-April the dearth of butterflies and moths has been, at least, as marked in this part as in those other portions of our islands from which complaints on the subject have found their way into the Magazine, so that there has been little or no inducement to carry the usual paraphernalia of a Lepidopterist during one's rambles in the woodland. To be sure, just before and after that date, *A. prodromaria* and *C. ridens* were now and then met with, after, in each case, a most diligent search; but, then, these captures are miserably insignificant if placed side by side with those made at corresponding dates in 1881, when one evening, after two hours' work, a collector returned home with thirty picked specimens of *A. prodromaria*, and, for want of space, left quite double that number on the moss, where they had just attained their full development. In fact, I have not used the net throughout the season, and this not through inability or indisposition, but because the weather was felt to be of such a kind, as to make it exceedingly probable that no adequate return would be gained by that method of collecting. To take the insects mentioned above a few pill boxes sufficed. From the 1st May onwards my total captures in the order do not amount to double figures, as it is little use (if any) to take of the commonest species more than enough for one's own series. Scanty as this number is, it includes an insect whose occurrence may be worth recording, namely, a very fine example of *A. alni* on the afternoon of

20th June. This insect is a conspicuous object when at rest, owing to the sharp contrast presented by the two principal hues of its coloration when viewed with a moss-grown trunk as the background, and to this peculiarity the present capture is doubtless due, and perhaps the rarity of the insect, as birds would not be likely to pass over so conspicuous a delicacy. Two facts bearing upon the *Lepidoptera*, and I shall have finished with the Order, as far as these notes are concerned. The first relates to the supposed complete absence of wings in the female *P. pilosaria*. On comparing series of the female *N. hispidaria* and *P. pilosaria*, it will be found that the stumps of wings are as well developed in the latter as in the former in (at any rate) most cases, and in all that I have examined (a good number) wing-scales could be plainly detected on the rudimentary appendages by the aid of a good lens.

As these spider-like insects possess so much in common, the coloration even being very similar in some instances, a difficulty might occasionally occur in their separation. The difference in the clothing of the tibiæ, however, as pointed out in "The Manual," being of constant character is conclusive, and shows at once to which of the two insects any one specimen must be referred. It seems strange that error should have crept in with respect to so generally distributed a species as *P. pilosaria*, and it at any rate fosters the suspicion that some other accepted facts in Natural History, which have been ably used to support theories, which go quite against the grain with the majority, may be found, on closer examination, to be fictitious.

The second fact which this season has helped to establish is the ability of *N. chaonia* to remain for two years in the pupa stage. Two males of this insect appeared in the breeding cage, one on the 21st March, and the other on the 8th April, from larvæ which spun up in 1880.

Turning now from that Order of insects which engrosses the attention of the majority of Entomologists to one equally, if not more, deserving of study, and certainly far more interesting from an anatomical or structural point of view—the *Coleoptera*, most of the species previously recorded from here have again occurred, and that too pretty freely, those that were taken in the greatest quantity being *Homalium planum*, *Silpha 4-punctata*, *Aphodius conspurcatus*, and *A. fatidus*. One evening in May *Calosoma inquisitor* was to be counted in scores ascending the trunks, and, on standing still in the forest solitude, a busy rustling was audible, caused (as fancy suggests) by a multitude of these beetles crawling over the fallen and decaying leaves of the past autumn, as the mature specimens sped on their way from the pupa chamber to a neighbouring tree. On the following day, at the same time, there were but one or two to be seen so engaged, from which it may be taken as almost certain that the emergence of the bulk of this species took place in a few hours, whereas, usually it may extend over several days. Such a number of examples were secured in the preceding season that not more than two dozen were taken, although, from the arboreal habits of the insect, it is but fair to conclude, that on any bright day in June hundreds might easily have been bottled by jarring the boughs and catching the results in an inverted umbrella, at all events, in that portion of the forest, for the insect is one of local habit. As hitherto unobserved in the district, I have to record the occurrence of *Coryphium angusticolle* under fir bark, *Lathrobium longulum* by stone-turning, *Molorechus umbellatarum* on a window curtain, *Chrysomela didymata* (hitherto scarce here) freely on *Hypericum* in September,

not far from the spot where *Chrysomela menthastri* may be picked off the heads of *Mentha*, and *Bledius subterraneus* extracted from the sandy soil beneath, if one has any eyes left for insects when surrounded by the enchanting scenery of the banks of the Wye between Monmouth and Symond's Yat.—A. E. HODGSON, Coleford: December 4th, 1882.

Captures at Deal.—In the early part of August last I had two or three days' collecting at the above mentioned watering place. Among the insects taken may be enumerated *Licinus depressus* and *L. silphoides*, *Xantholinus tricolor*, *Syncalypta hirsuta*, *Hypera fasciculata*, and a fair number of *Dianthæciæ* larvæ from *Silene maritima* and *S. inflata*. Along the cliffs between Walmer and St. Margaret's *Lycæna Corydon* made good show, being the only butterfly that one could not fail to notice and admire.—ID.

Description of the larva of Pterophorus pentadactylus.—On the 4th of July of last year, I received eggs of this species from Mr. W. H. B. Fletcher, deposited by a moth he had taken at Worthing. Five days later they hatched, and the newly-emerged larvæ were white, and clothed with long white hairs. They fed for a short time on convolvulus, but hibernated early, when still very small. In April, they recommenced feeding, but by the 15th, were only a little over a quarter of an inch in length. From that time they grew rapidly, and, by the 5th of May, the largest was nearly full-grown.

Length, nearly three quarters of an inch, and of average build. Head polished, it has the lobes rounded, and is a little narrower than the second segment. Body cylindrical, and fairly uniform, tapering only a very little towards the extremities. Segmental divisions clearly defined, the tubercles prominent, and from each of them springs a tuft of moderately stiff hairs: in the tuft of hairs from the tubercles on segments 2, 3, 4, 12, and 13, is a single hair, much longer than the rest, which stands out very conspicuously. Skin soft and smooth, but only very slightly glossy. Ground-colour of a median shade of dark green, exactly the colour, indeed, of the convolvulus leaf, on which it feeds. On the dorsal area, however, the ground-colour only appears as a large lozenge-shaped mark on each segment, except the ninth, the remaining space on each segment, and the whole of the ninth segment, being filled with bright lemon-yellow. The darker green alimentary canal shews through as the dorsal line; there are no perceptible dorsal lines, but there are long and continuous whitish streaks along the posterior half of the spiracular region. Head bright yellowish-brown, the mandibles reddish-brown, and the ocelli black and distinct. Tubercles intensely black, the hairs greyish. The imago from this larva was out on the 31st of May.—GEO. T. PORRITT, Huddersfield: December 9th, 1882.

Note on Crambus furcatellus.—About the middle of June we went to one of our old resorts in the Highlands. The first ten days rain, rain, then came a fine day and I ascended a hill nearly 2000 feet high. On the way I looked in on the *Scopula decrepitalis* haunt, and took three, and one *Asthena luteata*, they were almost the only insects to be seen in the place, every thing being in a great state of soak. Higher up I took one *Antithesia Staintonianiana*, the utter absence of insect life on most promising ground being quite remarkable. About 1000 feet up and flying over a beautiful

stretch of brown peat-bog were one or two *Amphisa Gerningana*, and on the slope above this *Mixodia Schulziana* appeared in great numbers, but no other species along with them, and as the distant mountain peaks were beginning to disappear in the clouds I hurried on, as the lovely day was evidently to be of short duration.

When close to the hill-top I found a *Crambus* flying, one that I had never seen before. It was entirely confined to the summit of the hill, and to the ground sloping down, perhaps twenty-five or thirty feet from the top. There were several rocky points, and immediately below and surrounding those rocky points, dry, springy turf, very short grass, and patches of mountain blackberry, and another plant the name of which I forget. The moth took quick short flights and invariably settled *on the ground*, never once on the grass: most likely the habit of alighting on the ground is for the purpose of concealment. At rest on the brown peaty soil with little fragments of the dry whitened herbage of the past season scattered about, *C. furcatellus* was almost invisible, had it rested on a blade of grass or other green thing, it must in the bright sunshine and clear mountain air have formed a conspicuous object, and be more liable to the attacks of birds. A pair of meadow Pipits (*Anthus pratensis*) nesting a little bit down from the hill-top and who had that wondrous tameness and fearlessness that most wild creatures seem to possess who choose for their summer homes those lonely solitudes where man rarely intrudes, most probably took measures to prevent *C. furcatellus* becoming too abundant.

It was not inclined to rise often on the wing unless disturbed, so I trudged up and down for two hours and secured some, and then saw that heavy clouds were drifting towards the place, and as I had a stretch of hill-bog to cross where landmarks were sadly wanting, I made a start for home and just reached the glen in time to escape a deluge.—JANE FRASER, 18, Moray Place, Edinburgh: November 27th, 1882.

Sericomyia borealis.—Some of your readers will remember a note of mine in this Magazine for December, 1881, on *Sericomyia borealis* "singing" while at rest. This note elicited interesting letters from Mr. Swinton, of Guildford, and Mr. Hellins, of Exeter. Curiously enough, Mr. Hellins' letter answers, at least in part, a question which was asked nearly thirty years ago, but has apparently hitherto received no answer.

In the Naturalist, for 1852, page 177, Mr. J. C. Dale gives an extract from a letter sent by Mr. Paris, the son of Dr. Paris, to Mr. Curtis; it is as follows: "I also wanted to ask you the name of an insect which bothered me occasionally when I wanted to be quiet and enjoy a fine view, but, unfortunately, I neglected to procure a specimen, and, unless you happen to have visited the spot they haunt, my description will not be sufficient. On the summits of the Dartmoor tors, not only on the highest rock, I was always assailed by a multitude of flies, bearing a resemblance to the bee (but not what we used at school to call "darting flies"), which came by two or three, increasing in number every moment, flying and buzzing in my face, until I was forced to a precipitate retreat. When they settled on the rock they began a very harmonious piping, to which I could willingly have listened, had the rest of the band desisted from their persecution. I defy any person to stand quiet for five minutes on the top of one of these tors. If you have visited Dartmoor, I am sure you must have noticed them."

Mr. Dale then mentions that he has shown this letter to Mr. Haliday, and spoken of it to Mr. Spence, but neither could make it out; and, he adds: "Can any of your correspondents suggest what insect this is?"

After giving extracts from Ray (page 273) and Mouffet (page 61), as probably referring to the same insect, he makes a guess, and asks whether this fly might be a *Tabanus*, *Asilus*, or, perhaps, less probably, *Estrus* or *Sericomyia*.

I think we are now in a position to say that Mr. Paris' piping fly was probably *Sericomyia borealis*. Mr. Hellins, in answer to my enquiry, informs me that the flies certainly never drove him away from the top of the Dartmoor tors; but when he was a boy their behaviour seemed to him to be rather threatening—he had not observed this in subsequent visits.

In conclusion, let me ask, can any one corroborate Mr. Swinton's suggestion, that *Sericomyia* oviposits in decaying stumps?—E. N. BLOOMFIELD, Guestling Rectory: December 15th, 1882.

Notes on British Hemiptera.—In the September number of this Magazine, page 87, I made some remarks on *Globiceps salicicola*, Reut., and I there said that I would send the examples which I had taken at Deal, and which I thought were referable to that species, to Dr. Reuter for confirmation.

I have just received these back, and am able now to state, on Dr. Reuter's authority, that they are not *salicicola*, but only our ordinary species, which, he informs me, frequently occurs on willows; he, at the same time, says that the specimen which he took in Scotland and recorded as *salicicola*, in vol. xvii, p. 13, of this Magazine, is also only our ordinary species, so that *salicicola*, Reut., will have to be expunged from our list. Dr. Reuter has very kindly sent me a ♂ and ♀ of this species, which is apparently quite distinct from either of our four-spotted species, as pointed out by him (*loc. cit.*). As the species occurs in Sweden, one may hope to be able some day to re-admit it into our list.

What I have here termed our ordinary species, *i. e.*, that called by Messrs. Douglas and Scott, in their monograph, *flavomaculatus*, Fab., by myself, in my synopsis, *fulvipes*, Scop., and by Dr. Reuter (*loc. cit.*), *flavomaculatus*, Fab., will now have to stand under the name *cruciatus*, Reut., as Dr. Reuter says that he has examined the Fabrician types of *flavomaculatus*, and finds that they belong to *selectus*, Doug. and Scott.

The synonymy, therefore, of these species will stand thus:—*flavomaculatus*, Fab., Fall., F. Sahlb., E. Saund. (*nec* Fieb., *nec* Doug. and Scott), = *selectus*, Fieb., Doug. and Scott; *cruciatus*, Reut., = *flavomaculatus*, Fieb., Doug. and Scott, Reut., *olim*, = *fulvipes*, E. Saund. (*nec* Scop.).—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 8th December, 1882.

Note on Aphalara subpunctata, Först. (*A. pallida*, Leth.).—M. Lethierry informs me that he takes this species abundantly, in the perfect state, in June and July, upon *Epilobium angustifolium*. As it has not been recorded as British, but might possibly be found here, perhaps some careful observer would look out for it during the coming season. I certainly saw no trace of it when at Boxhill searching for *A. nebulosa*, Zett., but then, my observations did not extend into the latter month. The life-history of this insect is also still buried in obscurity, and the dis-

covery of the parents might lead to that of the young, examples of which I shall be very glad to receive for the purpose of figuring. The plant occurs very sparingly in South Devon, but all my investigations were barren of results.—JOHN SCOTT, Devonport: 29th November, 1882.

Eumicrus rufus, Müll., at Hurst Green, Sussex.—Through the kindness of Mr. E. A. Butler, of Hastings, who presented me with the specimen, I have the pleasure of recording the occurrence of *Eumicrus rufus* at Hurst Green, a small village, one and a half miles from Etchingham Station on the S. E. railway, and about three miles from Hawkhurst. Mr. Butler took the insect on his little girl's dress, after she had been playing about for some time in a field, so that it evidently came out of the grass, and might probably be obtained by sweeping in the same locality. Its capture is interesting, as corroborating Mr. Champion's specimen, which he took in Richmond Park, and which has, I believe, up to this time, been the only recorded British specimen. The species is easily recognised by its rather short oval elytra, and almost globose thorax, neither of which are foveolate; the most curious point about it is its long metasternum, which makes the hind legs appear as if they came off the extremity of the body.—W. W. FOWLER, Lincoln: December 9th, 1882.

Myrmecoxenus vaporariorum at Birmingham.—In October last, I found this rare and interesting little beetle in some plenty in a hot-bed near here. It is somewhat remarkable that although I have examined hot-beds on the same spot year after year, I have never found *Myrmecoxenus* before, and that now it should turn up in numbers. The lesson seems to be that the more we work our old hunting-grounds the more productive they become.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: December 15th, 1882.

Review.

CATALOGUE OF THE TORTRICIDÆ OF NORTH AMERICA NORTH OF MEXICO: by PROFESSOR C. H. FERNALD (published in the Transactions of the American Entomological Society, Philadelphia, 1882). This is a valuable addition to the Lepidopterological literature of the United States, and cannot fail to afford great assistance to the rapidly increasing number of collectors and "scientists" who are giving attention to this interesting family. It has been carefully compiled by the author, after several years of patient and conscientious labour, during which he has made it his object to become personally acquainted with the types of all species described up to the date of publication. He has not spared himself the trouble of a journey to Europe for this purpose, and has, moreover, enjoyed exceptional opportunities of studying those types which have remained in various American collections.

The result of Professor Fernald's labours, so far as it has at present been given to the public, takes the form of a complete list of species, with full references to all synonyms, taken "in part from the valuable catalogue by Messrs. Staudinger and Wocke, but the greater part verified by reference to original works." To these are added, in all cases, the dates at which the different names were originally published.

We are promised, at some future time, a generic revision, based upon an arrangement of the material which the author has brought together from various parts of the world. Such a revision is undoubtedly much called for; the premature death

of Monsieur Henri de Peyerimhoff having deprived us of the completion of his extensive studies, of which the preliminary results, published in the *Annales de la Société Entomologique de France*, in 1876, had encouraged the hope that a systematic arrangement of the *Tortricidæ*, which should exhibit some improvement upon the valuable, but not wholly satisfactory, lines laid down by Heinemann (*Schmetterlinge Deutschlands und der Schweiz*), was not at that time remotely distant. All Lepidopterists will wish Professor Fernald success in this undertaking. In the catalogue now under consideration, he divides the *Tortricidæ* into three sub-families: *Tortricinæ*, *Conchylinæ*, and *Grapholithinæ*, in which he accords to Heinemann's sub-genera the rank of genera. The first of these sub-families containing *Teras*, *Cacæcia*, *Loxotania*, *Ptycholoma*, *Pandemis*, *Lophoderus*, *Sciaphila*, *Tortrix*, *Amorbia* (into which the genus *Hendecastema*, Wlsm., is properly sunk), *Synnoma*, *Enectra*, *Cenopis*, *Dichelia*, *Amphisa*, *Capua*, and *Platynota*. The second consisting of the two genera, *Idiographis*, Lederer, and *Conchylis*, Treitschke. These genera will probably be admitted to form a well-defined sub-family, on account of the degree in which their neuration differs from that of other *Tortricidæ*—the second vein of the anterior-wings taking its rise on the outer third of the discoidal cell—whereas, in all other genera at present characterized, it arises as far back, at least, as the middle third. The remaining genera are grouped together in the sub-family *Grapholithinæ*, and these are, for the most part, the same which, in Heinemann's classification, are regarded as sub-genera of *Grapholitha*. The proposal to erect sub-families seems worthy of adoption, in preference to that of Heinemann's, as not open to the objections raised by those who advocate a scrupulous adherence to the strictly binominal system of nomenclature.

It is difficult to understand why the author has hesitated to adopt the practice in general use of making the terminations of the generic and specific names invariably agree with each other. His habit of employing a feminine termination for all the specific names, without regard to the genders indicated by the terminations of the generic names to which they are attached, is obviously incorrect and inadmissible, even although it may be as he claims in his preface, "the course adopted in nearly every list or catalogue of these insects which I have seen from Linneus down."

On the other hand, he scrupulously corrects Stephens' spelling of his genus *Loxotania* to *Loxotænia*, although Stephens' error has been copied in Wocke's catalogue, and, almost without exception, in other works. He also adopts the correct spelling, *Conchylis*, in lieu of Treitschke's *Cochylis*, which has been frequently repeated by later authors.

I cannot entirely concur with Prof. Fernald in his extension of the genus *Proteopteryx*, Wlsm. The type of this genus, *P. emarginana*, has certainly a slight indication of a costal fold in the male sex, which should have been noticed in the original description, but this is not closely appressed, nor is it wide and conspicuous as in the genus *Pædisca*. The indentation of the middle of the apical margin of the anterior-wings is the chief character by which it may be distinguished. This indentation occurs in a limited degree (not to the same extent as in the typical species) in *Semasia? oregonana*, Wlsm., and *Pædisca resumptana*, Walk. (sp. ?), both of which our author includes in *Proteopteryx*; but the former of these two species has no costal fold, and the latter has the closely appressed wide costal fold of a *Pædisca*. *Anchylopera costomaculana*, Clem., also placed in the genus *Proteopteryx* by Prof.

Fernald, has the strongly indented margin of this genus, but, so far as I am aware, it has no costal fold whatever. Some revision will ultimately be required here unless the genus *Proteopteryx* should be recharacterized. A valuable addition has been made to this list in giving the names of the food plants of such species as have been observed in their larval stages. The very beautiful unpublished drawings, by Abbot, now in the British Museum, would afford some further information upon this branch of the subject.

With these few remarks, I commend this most useful catalogue of the *Tortricidæ* to the notice of all who are interested in the subject which it illustrates. It cannot fail materially to advance the study of the North American representatives of this family of the *Micro-Lepidoptera*. The results of the author's labours have already been widely circulated, not only in the Transactions of the American Entomological Society, but through the medium of Mr. A. R. Grote's check list of North American *Lepidoptera* (published about the same time in New York*), a work which is itself indispensable to all collectors.—WALSINGHAM, Merton Hall, Thetford: December 8th, 1882.

Obituary.

Archdeacon Hey.—On Wednesday, November 22nd, in his 72nd year, the Venerable Archdeacon Hey died suddenly at The Residence, York, of angina pectoris: although he had occasionally felt oppression in the chest, the ailment never assumed a serious form before the fatal attack, and in half an hour all was over. He was an enthusiastic Coleopterist; one of that diminishing band who form a connecting link with the old days of Curtis and Stephens, and in spite of his ever-increasing work, he always found some time to give to his favourite study.

He was fond of pointing out how his life might be divided into decades. In 1824 he was sent to school, in 1834 he took his degree, in 1844 he was made Head Master of St. Peter's School, York, in 1854 he was appointed an Honorary Canon of York and Vicar of St. Helen's, in 1864 he became Canon Residentiary, and in 1874 Archdeacon of Cleveland.

The *Hydradephaga* were his special study, and he thoroughly worked all the waters around York for this group: by far his best and most favourite locality was Askham Bog, from which he was perpetually sending good species to various collectors in different parts of the kingdom: not long since the writer of this notice had a day's work with him at Askham, when he went to work with his net (designed by himself and peculiarly suitable for working the bog) with an energy that many a man of half his years might have envied: he paid his last visit to this his favourite collecting ground, only last July, and had the satisfaction of once more taking specimens of the rarity he was always on the look out for, *Hydroporus Scalesianus*.† In his collection of insects he used to point with special pride to the original *Lissodema Heyanum*, bearing a label in Curtis' handwriting.

He took the greatest interest in the York Museum, and also in the meetings of the British Association.

His kindness and generosity to all who were in any way interested in his favourite pursuit will cause him to be long remembered and regretted by all Entomologists who had the pleasure of knowing him.

His son, the Rev. W. C. Hey, inherits his father's collections, and also his taste for *Coleoptera*.—W. W. F.

* To be had of Mr. Henry Edwards, Secretary of the New York Entomological Club.

† A list of his chief Askham Bog beetles will be found in Ent. Mo. Mag., Vol. xviii, p. 7.

ON A NEW SPECIES OF *MOUHOTIA* (SCARITIDÆ).

BY GEORGE LEWIS.

In the January number of this Magazine, 1879, I noticed a new species of *Mouhotia* from Burma, and I am now able to bring forward another, the third in the genus, discovered by Dr. Hamand on the banks of the River Mekong. If I rightly understand the habits of those insects, they live much as *Craspedonotus* does in China on the banks of the Yang-tze; they burrow into the banks of rivers which run through large alluvial plains and then sit watching for prey at the orifices of their holes. To find *Craspedonotus* in China, you must follow up the Yang-tze for 500 or 600 miles when the soil becomes light and sandy. Near Shanghai all is mud, and it is the same on all large rivers near the mouth. The Cambodia river as far as Saigon is too muddy for large *Scaritidæ*. I visited the last place in 1880, and left some drawings of *M. gloriosa* with a resident in the hope of obtaining something like it, but hitherto there has been no result.

MOUHOTIA CONVEXA, sp. n.

Nigra, prothoracis margine laterali basaliq̃ue necnon elytrorum marginibus lateralibus late cupreis; elytris convexis, striis bilineatim punctatis, interstitiis planis, marginibus angustis. Prothoracis lined medianâ longitudinali nullâ vel obsoletâ.

Long. (cum mandibulis) 20 lin.

This species is the size of *M. Batesi*, but the difference of outline between the two species is very considerable. The head, thorax and the elytra especially are more convex; the thorax is much less constricted behind, and at the base measures 5 lines in breadth, while *M. Batesi* attains barely 4 lines there. The convexity of the elytra gives them a much narrower margin than in *M. Batesi*, and each stria (there are 9 or 10 in all) consists merely of a double line of punctures; the interstices are quite smooth and level. The elytral striæ are strongest at the sides and at the apex. In the region of the scutellum the striæ or points run gradually into single rows, and near the base of the wing-case they are almost obsolete. The thoracic medial line, which is very clearly defined in *M. Batesi*, has almost disappeared in *M. convexa*.

I am much indebted to the kindness of M. Blanchard, the well-known *savant* of Paris, for my example of this species, which is one of a fair series from Laos through which the river mentioned runs.

Mr. C. O. Waterhouse gives a figure of *M. Batesi* in his "Aid to the identification of Insects" for January, and has kindly promised to figure the present species in the part forthcoming in April. Of the two species here noticed, *M. gloriosa* comes nearest to *M. Batesi*.

NOTES ON THE *TRICHOPTERA* OF UPPER CLYDESDALE.

BY KENNETH J. MORTON.

The following notes may be interesting, as giving some idea of the species of *Trichoptera* occurring in a district, the insect fauna of which is very imperfectly known. Limited spare time has restricted my collecting operations to the immediate vicinity of Carluke; all the species referred to below having, with the exception of one or two from Lanark Loch, been taken within a radius of three miles around this place.

The physical conditions of the area just indicated, are almost as diversified as could be expected within such narrow bounds, elevations ranging from about 200 ft. at the level of the Clyde, to over 1000 ft. in one part of a high-lying moorland tract. The Clyde, near here, is a moderately swift river (interrupted here and there with more slowly-running reaches), running through a warm and sheltered valley: in the two miles or so of its course, which I have worked, I have taken no fewer than forty species of *Trichoptera*. Several of its tributary burns intersect the district, and these are also tolerably rich; but their productiveness is evidently impaired in some parts by the water pumped from mines being discharged into them. But ponds and marshes are not very frequent, they almost all occur in the higher-lying parts, and are of small extent: there is a fair representation of the species affecting water in such conditions, but the dearth of individuals is marked. Lanark Loch, distant about six miles from here, doubtless produces a number of lacustrine species, but I have only been able to visit it on two or three occasions. It may be mentioned that limestone (the presence of which, as Mr. McLachlan has pointed out has a favourable influence on aquatic insect-life) is abundant in the Carluke district.

The *Phryganeidæ* are represented by three species: *Neuronia ruficrus*, Scop., one specimen; *Phryganea striata*, L., frequent at one pond; and *Ph. obsoleta*, McLach., common at most standing waters: the specimens larger and darker than others from the North of Scotland, which I possess.

Colpotaulius incisus, Curt., occurs in suitable places, but I have taken but few specimens.

Limnophilus rhombicus, L., rare. *L. marmoratus*, Curt., one specimen. *L. stigma*, Curt., rare. *L. lunatus*, Curt., *centralis*, Curt., and *vittatus*, F., are common. *L. auricula*, Curt., common in the fir woods around Lanark Loch; also taken in a wood near Carluke. *L. griseus*, L., one specimen, several years ago, but the species has not been seen since. *L. extricatus*, McLach., frequent, flies at dusk. *L. luridus*, Curt., one specimen. *L. sparsus*, Curt., frequent. *L. fuscicornis*, Ramb., two specimens, one on the Clyde, the other at a deep pond.

Anobolia nervosa, Curt., common on the Clyde and elsewhere. At a pond near here, during the afternoon of a fine day at the beginning of September of this year, I noticed several males taking short flights; numerous examples were resting on the tops of rushes quite exposed, several pairs being *in copulâ*.

Asynarchus cænosus, Curt., two specimens, in August, at a moor-pool.

Stenophylax infumatus, McLach., several specimens on the Clyde, and one at a burn, in June. On the Clyde the species appears to be restricted to one spot where the water runs rather slowly; it is very difficult to dislodge from the hollowed-out banks where it conceals itself. To give a better idea of the nature of the locality, I may mention several insects that occur at the same place, viz.: *Goëra pilosa*, *Sericostoma personatum*, *Lype phæopa* and *Limno. fuscicornis*, the last-named appearing very much to resemble *infumatus* in its retiring habits. *S. rotundipennis*, Brauer, a pair (♂ ♀) on a burn near Carluke, in August, 1881, but I did not succeed in finding it this season. *S. stellatus*, Curt., swarms on the Clyde and elsewhere, appearing as early as 1st of June, and continuing to the end of September. *S. vibex*, Curt., one ♀ on the Clyde, 1st of June.

Micropterna sequax, McLach., and *lateralis*, Steph., are both apparently rare.

Halesus radiatus, Curt.—About the end of August last, this species literally swarmed at dusk, at two different burns; also occurs on the Clyde. *H. digitatus*, Schrk., a few specimens on the Clyde in October. *H. auricollis*, Pict., frequent on the Clyde in September and October; the examples are larger than any I have seen from the North of Scotland.

Drusus annulatus, Steph., a common insect at every stream; the only ♀ I possess was taken about the middle of May; I have seen males at the end of September.

Ecdisoptyx guttulata, Pict., very common at most streams.

Chatopteryx villosa, F., frequent on the Clyde in October.

Sericostoma personatum, Spence, not uncommon on the Clyde and elsewhere.

Goëra pilosa, F., common on the Clyde; it also occurs frequently at most of the other streams.

Silo pallipes, F., abundant at every stream.

Brachycentrus subnubilus, Curt., abundant on the Clyde, in some years appearing in myriads.

Lepidostoma hirtum, F., common on the Clyde.

Beræa pullata, Curt., and *B. maurus*, Curt., frequent at swampy spots on the banks of different burns.

Beræodes minuta, L., is rather common on a small burn at a place where there is little or no current, and where the margins are boggy and rush-covered.

Odontocerum albicorne, Scop., common on the Clyde.

Leptocerus annulicornis, Steph., frequent on the Clyde. *L. aterrimus*, Steph., very abundant; the var. *perfuscus* much the commoner form. *L. cinereus*, Curt., common. *L. albifrons*, L., abundant on the Clyde. *L. commutatus*, McLach., frequent on the Clyde; apparently partial to places where the water does not run very quickly. *L. bilineatus*, L., tolerably common on several streams.

Mystacides nigra, L., apparently rare on the Clyde. *M. azurea*, L., common. *M. longicornis*, L., in abundance at Lanark Loch, and very variable.

Æcetis ochracea, Curt., in profusion at Lanark Loch; also occurs rarely at some ponds near Carluke. (*Æ. lacustris*, Pict., not before recorded from the West of Scotland, occurs in Bute.)

Four species of the genus *Hydropsyche* occur on the Clyde. *H. pellucidula*, Curt., and *H. instabilis*, Curt., are frequent, the latter also occurring on two or three other streams; the males of these species are much given to wandering, and I have taken specimens of both flying wildly over hedgerows, in the evening, at long distances from running water. *H. guttata*, Pict., dances in swarms over the tops of the bushes in the afternoon sunshine and in the evening; the specimens are of large size and dark. *H. lepida*, Pict., is sometimes common, but irregular in its appearance.

Wormaldia occipitalis, Pict., one specimen at a small burn. *W. subnigra*, McLach., frequent at a small waterfall on one of the burns (a ♀ from the Clyde is referred to this species with doubt).

Plectrocnemia conspersa, Curt., a very common insect, and *P. geniculata*, McLach., occurs along with it frequently at one burn.

Polycentropus flavomaculatus, Pict., the most ubiquitous Trichopteron in the district. Of *P. multiguttatus*, Curt., I have taken a single ♂ on the Clyde.

Cyrnus trimaculatus, Curt., not very common.

Tinodes wæneri, L., common at two burns.

Lype phæopa, Steph., frequent at one place on the Clyde.

Psychomyia pusilla, F., abundant on the Clyde.

Rhyacophila dorsalis, Curt., is as annoyingly common in this district, as it appears to be elsewhere. *Rh. septentrionis*, McLach., very common at one burn about the end of May and during June. *Rh. obliterata*, McLach., common on most of the streams from the end of August to the end of October. The occurrence of three of the four recorded British species of this genus on the same burn (but, of course, at different times) is noteworthy.

Glossosoma vernale, Pict., common on the Clyde from April to October.

Agapetus fuscipes, Curt., common on one burn. *A. comatus*, Pict., very common on the Clyde.

The *Hydroptilidæ* find no place in my list; I cannot doubt that some minute representatives of this family do occur, but have, as yet, been overlooked.

The list, even for this immediate neighbourhood, cannot be considered nearly complete, and any one working over a wider area, and with more time at his disposal than I have, could very largely augment it; but, I think, the sixty-nine species enumerated above, justify me in coming to the conclusion that the southern part of the district, drained by the Clyde, is possessed of a very rich Trichopterous fauna.

Mr. McLachlan has very kindly confirmed for me such species as I had any doubt about, and Mr. J. J. King, of Glasgow, has assisted me in many ways.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(continued from p. 172.)

PSELAPHIDÆ and SCYDMÆNIDÆ.

BRYAXIS COTUS, Sharp.

The insects taken near Thornhill by Dr. Sharp, and distributed by him under the name of *B. Lefebvrei*, belong to a new species, and must stand in our list under the name of *B. cotus* (Ent. Mo. Mag., xii, 225).

EUPLECTUS DUPONTI, Aubé.

This French species was first taken in England by Mr. Lawson, near Scarborough: it is rather a flat insect, with the head broad at the sides; the male is more shining than the female, and has its head punctured only on the sides, and the thorax and clytra almost impunctate, whereas the female is not very shiny, and has the head rather thickly and plainly, and the thorax and elytra moderately thickly, punctured; the characters of the abdomen in the male also serve to distinguish it; Aubé (Monographia Pselaphiorum, p. 57) says that it is very like allied species, but is distinguished by the front fovea of the head being wider, and by its longer and more slender antennæ.

Euplectus piceus, Mots.

This species, recorded as new in Ent. Mo. Mag., xii, 225, is apparently synonymous with *Euplectus nigricans*, Chaud. *E. sulcatulus*, De Sauley, is also synonymous with the same insect, as also is *E. Dennyi*, Wat. Reitter (Bestimmungs Tabellen der Europäischen Coleopteren, Part v, 1881, p. 525), gives the right synonymy.

Euplectus Abeillei.

Dr. Sharp records this insect (Ent. Mo. Mag., xii, 225) on the authority of M. De Sauley: it is not, however, in Stein and Weise's catalogue, nor is it mentioned by Reitter (*l. c.*) among the numerous species of which he gives descriptions.

Euplectus Kirbyi, Denny.

This species has been considered as synonymous with *E. nanus*, Reich.; it was, however, again separated by Mr. Waterhouse as distinct (Ent. Mo. Mag., xvi, 123), on the ground that the furrows in the forehead are parallel in *E. nanus*, and converge strongly in *E. Kirbyi*. Reitter (*l. c.*, p. 525) refuses to admit *E. Kirbyi* as a separate species, unless Mr. Waterhouse can point out the specific differences of the male. I have type specimens of both insects, and they show a very marked difference in the sculpture of the head, which is generally considered to be a most important point in the *Euplecti*. Dr. Sharp, in his catalogue, considers *E. nanus*, Reich. (see Ent. Mo. Mag., viii, 84), and *E. Kirbyi* to be synonymous. Both Aubé and Denny make *E. nanus*, Reich., and *E. Reichenbachii*, Leach., synonymous, but

consider *E. Kirbyi* a distinct species. Denny's figures of the two species (*E. Kirbyi* and *E. Reichenbachii*) are very distinct; Aubé's bear a close resemblance, but neither his figures nor his descriptions are always to be depended on.

EUPLECTUS MINUTISSIMUS, Aubé.

This very distinct species was taken in numbers by myself and the late Mr. Garneys in flood rubbish, near Repton, in June, 1879. Its very small size, linear shape, and spine at the apex of the abdomen of the male, will at once distinguish it from all our other British species. It differs so much from Aubé's description and figure (Psel. Mon., p. 59), that, considering it a new species, I gave it the provisional name of *E. Garneysi* (Ent. Mo. Mag., xvi, 158). M. Brisout, however, kindly compared it for me with Aubé's types, and, although admitting the discrepancies and the need of a fresh description, expressed his opinion that it was *E. minutissimus*, which opinion is endorsed by M. Reitter (*l. c.*, p. 90). It appears to be a rare insect on the continent, and has not been taken either before or since June, 1879, in Britain, and only in the locality mentioned.

Trimium brevipenne

Is the female of *T. brevicorne*, and cannot, therefore, stand as a species.

EUMICRUS RUFUS, Müll.

Two specimens of this species have occurred in Britain, one taken by Mr. Champion in Richmond Park (Ent. Mo. Mag., vii, 273), and one by Mr. Butler recently (Ent. Mo. Mag., xix, 190) in Sussex. It is a shining rufo-testaceous insect, with scarcely any pubescence, with no perceptible foreæ at the base of the thorax or elytra, and no punctuation, except very sparsely on the elytra. Its legs are long, and the long metasternum makes the hind pair appear to start almost from the apex of the body. I have compared Mr. Butler's specimen, which he very kindly gave me, with a type sent by M. Aubé to Mr. Matthews.

Scydænus Sharpi, De Sauley, and *Sc. glyptocephalus*, De Sauley.

These two species—recorded by Dr. Sharp (on De Sauley's authority), Ent. Mo. Mag., xii, 225, the former as allied to *S. rubicundus*, and the latter as really representing the *S. carinatus* of our list—are not included in the European catalogue, nor does M. Reitter, who is the latest authority, mention either of them, either as species or as synonyms.

SCYDMÆNUS PRÆTERITUS, Rye.

This species is allied to *S. Sparshalli*, Denny, but is easily distinguished by its darker colour, longer and less convex shape, &c.; it has the facies of a small *S. elongatulus* (Ent. Mo. Mag., ix, 6).

Scydænus pumilio, Schaum.

This species appears to be identical with *S. minutus*, Chaud. Mr. Rye (Ent. Mo. Mag., ix, 18) strikes this species out, as the few supposed British exponents that he has seen are small *S. Sparshalli*. The synonymy of *S. Sparshalli* and its allied species (*S. helvolus*, Schaum, *S. præteritus*, Rye, and others) is most confused, and requires careful working out.

TRICHOPTERYGIDÆ.

Ptinella Proteus, Matth.

This species is identical with *P. testacea*, Heer. The latter name has the priority, and must be inserted instead of the former.

Ptinella pallida, Er.

It is very probable that this insect, which is generally regarded as a variety of *P. aptera*, Guer., will eventually prove to be a distinct species.

Trichopteryx convexa, Matth.

The name of this species must be altered to *T. convexiuscula*, Mots., which has priority.

TRICHOPTERYX FRATERCULA, Matth.

Easily distinguished from other species by the enlarged and peculiarly curved posterior angles of the thorax (resembling the bill of the puffin, *Fratercula arctica*), and also by the superficial sculpture of the same part. In the British list it comes just before *T. grandicollis*. Taken by Mr. Matthews near Gumley (Ent. Mo. Mag., xv, 65).

TRICHOPTERYX CANTIANA, Matth.

Differs from *T. lata* in its thorax being much less dilated at the sides, its shorter, more robust, and entirely black antennæ, its deep black colour, and very short pubescence. Taken by Mr. and Mrs. Wollaston near Tonbridge, and by myself near Repton (Ent. Mo. Mag., viii, 153).

TRICHOPTERYX LÆTITIA, Matth.

Allied to *T. fascicularis*, Herbst., but differs from that species in its smaller and more depressed thorax, shorter and pitchy-black antennæ, and in its conspicuously smaller size. Taken in Belgium, near Spa, by Miss L. Matthews, and described as a new species in Ent. Mo. Mag., ix, 189. First recorded as British by myself, in Ent. Mo. Mag., xvi, 160. Mr. Billups and several other collectors have taken the species, which is probably common.

TRICHOPTERYX CHAMPIONIS, Matth.

A very distinct species, distinguished by its narrow form and castaneous tint: it must be placed between *T. fascicularis* and *T. seminitens*. Taken in Wicken Fen; given to Mr. Champion by Mr. Harris, of Burton-on-Trent, who received them from a man living in the Fen district (Ent. Mo. Mag., xv, 64).

TRICHOPTERYX SEMINITENS, Matth.

Allied to *T. fascicularis*, but distinguished by the greater convexity of its form, the shining surface and remote sculpture of the thorax, and shorter piceous antennæ; allied also to *T. attenuata*, from which it differs in its larger size, much greater convexity, shorter antennæ, and in the sculpture of the thorax (Ent. Mo. Mag., xiv, 36).

TRICHOPTERYX VOLANS, Mots.

This species must be placed immediately after *T. sericans*, from which it differs in its larger size, much shorter pubescence, sculpture of thorax, and longer elytra. Taken by Mr. Champion in Scotland. (Ent. Mo. Mag., xv, 64.)

TRICHOPTERYX LONGICORNIS, Mann.

An old species, accidentally omitted. Distinguished by its long antennæ, and general sculpture.

TRICHOPTERYX EDITHIA, Matth.

Distinguished by its griseous brown colour and long pubescence, the peculiar form of the thorax, which is sub-quadrate, with the sides much rounded, and the long, slender, bright yellow legs and antennæ. Taken by Mrs. Wollaston, near Tonbridge. (Ent. Mo. Mag., viii, 152.)

TRICHOPTERYX LONGULA, Matth.

Differs from the allied species, *T. picicornis*, in its elongate oval form, its shorter and narrower thorax, longer and more slender antennæ, and closer and finer sculpture (Ent. Mo. Mag., viii, 152). Only four specimens of this species were known when it was introduced. It is certainly rare, but probably less so than is generally supposed, for I have taken it myself at Repton, at Lincoln, and at Gumley, always in a hot-bed.

TRICHOPTERYX CARBONARIA, Matth.

This species rests on a single specimen taken by Mr. Matthews in Thoresby Park, Nottinghamshire. It is allied to *T. picicornis*, but differs from that species in its paler and more slender antennæ, of which the eighth joint is linear and not incrassate, and also in the totally different sculpture of its thorax and elytra. (Ent. Mo. Mag., ix, 179.)

TRICHOPTERYX RIVULARIS, Allib.

Very near *T. Montandonii*, but distinguished by its more elongate form, and longer thorax, and by the sculpture of the latter. It is not an uncommon species. I have taken it in Lincoln, and it has occurred in other places. (Ent. Mo. Mag., viii, 152.)

TRICHOPTERYX FUSCULA, Matth.

A very distinct species, apparently very rare: it is easily distinguished by its short quadrate form, and the long brown hairs with which it is covered. Taken by Mr. Matthews near Gumley. (Ent. Mo. Mag., viii, 152.)

PTILIUM MARGINATUM, Aubé.

This species is allied to *P. Spencei*, from which it may be distinguished by its usually greater size, the greater width and closer sculpture of the thorax, which is widest at the base, and has the basal margin evidently reflexed. Taken by Mr. Matthews and Mr. Crotch, in the Cambridgeshire Fens, 1868. (Ent. Mo. Mag., xiv, 36.)

PTILIUM CALEDONICUM, Sharp.

Also allied to *P. Spencei*, but very distinct: its thorax is rather narrower than the elytra, much broader than long, with the sides rounded in front and much narrowed behind, without any channel. It is fusco-testaceous in colour. Taken by Dr. Sharp and Dr. Buchanan White, under bark of a dead Scotch fir at Braemar. (Ent. Mo. Mag., viii, 73.)

PTILIUM CÆSUM, Er.

A fine distinct species, easily distinguished by its wide form, large head, and the convergence towards the front of the lateral lines of the thorax: it is dark testaceous in colour. Taken by Mr. Crotch in 1870, in the Cambridgeshire Fens. (Ent. Mo. Mag., ix, 179).

PTENIDIUM ATOMAROIDES, Mots.

Easily distinguished from *Pt. evanescens*, Marsh. (*apicale*, Er.), by the smaller size of its head and thorax, and much longer and broader elytra. Taken by Mr. Crotch, probably near Brandon, in Suffolk. (Ent. Mo. Mag., viii, 152.)

PTENIDIUM KRAATZII, Matth.

This very distinct ant's-nest species is probably commoner than is supposed, and is very likely often confounded with *Pt. formicetorum*, Kr. It is, like that species, reddish in colour, but much darker, and has its elytra strongly punctured with large punctures, whereas the elytra of *Pt. formicetorum* are almost glabrous. Two specimens only (taken by Mr. Foxcroft, in Scotland) were known when the species was described (Ent. Mo. Mag., viii, 152). I now record it for the first time as English, having taken several specimens from ant's-nest rubbish from Buddon Wood, Leicestershire, where it is probably common.

Ptenidium Wankowiczii, Matth.

This species has been considered too close to *Pt. apicale* to be separated: it is, however, quite distinct, being much narrower, especially in the thorax, the four basal foveæ of which are distinct; in *Pt. apicale* they are obsolete.

Ptenidium turgidum, Thoms.

Of this very rare and very distinct species hardly any British specimens were known: some time ago, I found an example among some of Mr. Wilkinson's *Trichopterygidæ*, in the possession of Mr. Mason, and Mr. Matthews subsequently detected several others.

CLAMBIDÆ.*Clambus punctulum*, Gyll.

This species must be omitted, the specimens on which Mr. Crotch introduced it being apparently small *C. minutus*. (Ent. Mo. Mag., ix, 8.)

(To be continued).

CIMEX OR ACANTHIA.

BY J. W. DOUGLAS.

“Under which king, Bezonian?”—*King Henry iv.*

In the “Wiener entomologische Zeitung” for December (vol. i, page 301), Dr. O. M. Reuter has an elaborate article on the controverted subject of the employment of the generic names *Cimex* and *Acanthia*, in which he refers to what has been written thereon in the “Annals and Magazine of Natural History,” 1868, in the “Zoological Record,” 1869, and in this Magazine xi, 186, and xvi, 172. He says truly that Linné had no idea of a generic type, as appears from the very general characters given to his genera, and yet, that although he divided his genus *Cimex* into sections, it may, nevertheless, be possible that he particularly (“gerade”) intended the name for *lectularius*. This is Dr. Reuter’s idea, but Linné could not logically have done so when he fenced *lectularius* with special discordant characters. Dr. Reuter, however, claims to retain the generic name *Cimex* for *lectularius*, not only on the ground of his idea, but because Latreille (having ignored or not having rightly comprehended the Fabrician type of *Acanthia*, which as Fabricius afterwards showed he intended to be *C. lectularius*, Linn), had intermediately instituted a genus *Cimex* for *lectularius* only;—and this is called obtaining priority! At most, however, the genus is *Cimex*, Latr., *nec* Linn.;—a chaotic anomaly. As followers of Latreille are cited Laporte, Herrich-Schäffer, Spinola and Stål (to whom Westwood and Pascoe might have been added); and as followers of Fabricius, Fallén, Burmeister, Flor and Fieber (to whom might have been added Anton Dohrn, J. Sahlberg and others).

Dr. Reuter now contents himself with saying “Wenn eine Gattung in mehrere zerlegt wird, so ist der ursprüngliche Gattungsname für eine der Tochter-Gattungen beizubehalten, und zwar für diejenigen Arten, welche der erste Demembrator mit diesem Namen bezeichnet hat.” On a former occasion he went somewhat further and said “I think the author *first* making such a division of a genus should have the privilege to employ the name formerly belonging to the entire complex for such of the new genera as he pleases” (Ent. Mo. Mag. xvi, 173). I have already said I do not admit such procedure is equitable, neither has it scientific accuracy: moreover, *Cimex* of Linné, being a genus of such proportion as to include all the *Gymnocerata*, the name is now applicable only as a great divisional appellation and cannot be justly appropriated to any of the separated

genera; if so used it is not, at any rate, *Cimex*. of Linné, but is a misappropriation and misleading. I apprehend this is not the only misapplication of an old generic name.

The question of *Acanthia* versus *Salda*, which similarly has adherents for or against respectively, as cited by Reuter, turns in some aspects partly upon the solution of the previous question *Cimex* or *Acanthia*.

While I still differ from my respected friend Reuter, I can yet agree with him in saying "Wir stehen ja noch nicht am Ende der Wissenschaft." Names are only appliances and outworks that Science uses in erecting her temple, yet it is rationally important for progressive stability that revision, restoration, and addition should be made on just principles. What constitutes a genus is still a matter of individual opinion: the rage is to magnify specific differences to generic proportions, in which process there is a race for priority, and thus new names are created to-day only to be abolished to-morrow—sometimes by the author himself. So far from being at the end of science we are yet but at the beginning. There is no finality in science. Doubters of current doctrine may have a wider and truer basis of faith than the absolute believer of the period; the scepticism of one generation becomes the orthodoxy of another, and this, again, the starting-point for the acquisition of new insight.

8, Beaufort Gardens, Lewisham :

26th December, 1882.

DESCRIPTION OF THE LARVA OF *DICYCLA* *OO*.

BY WILLIAM BUCKLER.

The furious salt gale of the 29th of last April damaged the trees in most localities to such an extent, that it was a hopeless task to go beating for the larvæ usually taken by that process in May; but, of course, there were some trees so situated as to be guarded by high ground from the stroke of the blast, and from one such oak tree my friend, Mr. Hellins, was fortunate enough to obtain the larva of the above named species.

As far as we know, neither the larva nor the imago had been taken in Devonshire before, so it is an addition to the local fauna of that county.

When first taken, 19th of May, it was not come to full growth, being less than an inch in length, and was preparing for a moult, so that its appearance puzzled Mr. Hellins, who sent it to me as perhaps

the young stage of some *Tæniocampa*, which he had forgotten, and in this, without closely examining more than the first two segments protruding from some leaves and portending a moult, I acquiesced; however, an examination of the larva after the completion of its moult, and further correspondence, soon convinced me it was no *Tæniocampa*, and reference to a copy which I had by me of Hübner's figure of *D. oo*, showed me at once that I had at last obtained an example of that desideratum.

The moult took place during night or early in the morning of May 22nd, and in course of that morning I saw the larva feeding well as it lay quite openly exposed to view, though afterwards it kept itself more secluded, both by day and night, amongst the leaves of the oak spray provided for it, but, so far as I could see, without spinning them together, and it became full grown by the 27th, and went to earth on 29th; and the imago, a male, appeared on the 8th of July.

Very soon after the moult it was nearly an inch long, and when full-grown and stretched out 1 inch $4\frac{1}{2}$ lines in length, very cylindrical, the head being only a trifle less than the second segment, and the thirteenth very little tapered, the head full and rounded, jet-black and glossy, the ground-colouring of the body was also jet-black above as far as the anal flap which was brown, and dark brown on the belly; the plate on the second segment quite as glossy as the head; the rest of the smooth skin had but a very slight gloss; a pure white dorsal stripe began rather narrow on the plate and thoracic segments, and from thence much broader on all the others, but on each of them was contracted in the middle and divided so as to form a series of long elliptical marks, the very thin sub-dorsal line of pure white began with two isolated spots on the side margin of the neck plate, and thence ran uninterrupted to the end of the anal flap; the broad spiracular stripe of rather yellowish-white was on the third and fourth segments interrupted deeply on its upper margin, and from them passed along of uniform breadth as far as the anal legs, and having a thin line of dark grey running through the middle, on which were the spiracles of red-brown finely outlined with black; the very small tubercular dots of pure white ranged in threes on either side of the back and singly above and below the spiracular region on each segment; the anterior legs were black, the ventral and anal legs brownish-green and semi-pellucid; the thoracic wrinkles and segmental divisions showed black upon the white stripes and lines.

Just before the larva was allowed to enter the earth it had lost

its perfect black ground on the body, which had become somewhat of a brownish-green.

The cocoon, found about three-quarters of an inch below the surface of the earth, was of oblong shape, the diameters 11 lines by 8, it was composed of earthy particles lightly held together with a few threads, and though smooth inside, was without any perceptible lining of silk.

The pupa-skin was 7 lines long, very stout in proportion across the thorax, the abdominal segments tapered to the rounded tip furnished with two very fine straight and pointed spines, smooth in all its parts; of a dark warm brown colour and glossy.

Emsworth: December 6th, 1882.

New localities for Trioza crithmi, F. Löw.—Having had occasionally a few hours to call my own whilst in this neighbourhood, I paid some visits to the rocks under Plymouth Hoe, and there I found that the samphire grew tolerably plentiful. A very superficial examination of the plant revealed to me the fact that the above named species was there in abundance in all its stages. From July until near the end of August their numbers did not seem to diminish, although I took but few merely for the sake of the locality. A little later on in the season, my friend, Mr. Bignell and I made an excursion to a place called Wembury, and there also amongst the cliffs we found it, but sparingly. On our way thither, and the road is a rough one, we examined a large quantity of *Artemisia absinthium*, growing on both sides of a hedge on a farm on the Langdon Hall estate, in the hope of taking *Aphalara artemisiæ*, but there was not any sign of it, although the locality seemed a very likely one.—JOHN SCOTT, Devonport: 19th November, 1882.

[Mr. C. W. Dale informs me that he found *Trioza crithmi* this year in the Isle of Portland.—J. W. D.]

The early life of Psylla pyricola, Först.—Up to the present time I have spent over 140 days here, out of which there have not been more than 20 fine ones. When the weather was fine and the time not otherwise occupied, a ramble was taken with more than ordinary gusto, and being desirous of becoming acquainted with the *Psyllidæ* on pear trees, in the hope of getting *Psylla pyri*, Linn., if it was really to be found in Britain, or at least, here, and Mr. Parker, Manager of the Royal Hotel, having very kindly given me an introduction to Mr. Brighton, head-gardener at Mount Edgcumbe, I shortly afterwards waited upon that gentleman, who at once gave me permission to wander about the grounds and gardens of the estate whenever I pleased. I accordingly paid several visits to the place between August and October, but all my searching failed to lead to the capture of *P. pyri*. On some of the pear trees, however, *P. pyricola*, Först., actually swarmed, and having beaten a few of the nymphs into my umbrella I began next to examine the leaves. On them I soon discovered the ova laid irregularly along each side of and on the midrib itself. They are of a deep yellow colour, somewhat elongate, narrower or almost

pointed at one extremity. When the young quit the ova they are pale oval bodies with somewhat thick legs which they scarcely seem to know what to do with, but in a day or two they get used to them and run about somewhat actively. In the meantime they have increased in size and have indications of some dark marking on the head and down the back. I also observed that the leaves were finely perforated on the upper surface, from which exuded a secretion which I tasted and found to be very sweet; the young in all stages and in numbers might be seen evidently feeding upon and enjoying it. As the larvæ grow older they become of a greenish-white colour, knobbed hairs may be detected around the sides of the abdomen, and a few simple ones on the front of the head; the elytra-lobes now begin to be distinct; two lunate patches appear on each side of the crown, the eyes are pale purple, the base of the abdomen becomes brown and at the junction of three or four of the segments is a small dark spot on each. On changing to the nymph-state the entire creature becomes of a more or less dark brown colour, and the front of the head rounded, along which, between the antennæ, are a few short hairs; the crown is divided down the centre by a pale greenish or yellowish line, and has posteriorly two curved ones of the same colour uniting with the central one and forming an anchor-shaped character; along the inner margin of the eyes there is also a pale streak, and on each side the centre near the posterior margin a triangular black-brown patch; the antennæ are pale green; two basal joints slightly fuscous; 1st joint with a short rigid hair at its apex, on the inside. Eyes purple; pronotum yellowish or greenish with about four large and two or three other small brown spots of irregular shape down each side of the centre. Elytra-lobes dark brown, darkest next the suture separating them from those of the wings; costal margin with two short hairs, one near the base pointing in a forward direction, the other near the middle. Legs pale or yellowish-green; tibiæ, 2nd pair with two knobbed hairs on the outer margin. Abdomen frequently clear emerald-green at the base (♂ sexual); incisions of the first one or two segments narrowly brown on each side of the centre, followed by a large cuneate patch of dark brown; margin with about seven knobbed hairs on each side. Length about $\frac{3}{4}$ line (Paris).—ID.: December 2nd, 1882.

Great destruction of Pieris brassicæ by Apanteles.—From the injury sometimes done by larvæ of *Pieris brassicæ* and *P. rapæ* among cabbages, I presume the circumstance I am about to relate is very exceptional, as were it otherwise, these butterflies would hardly survive the exterminating process.

Having by mistake failed to preserve specimens of *Apanteles glomeratus* for my collection, I last summer determined to supply the deficiency; and hearing that a few larvæ of *Pieris brassicæ* had been found in the garden and destroyed, I sought for more, finding only nine. Of these one died, while from *all the others* emerged larvæ of the parasite, none of which were stung by any hyperparasite. Partly by counting and partly by estimate I arrived at 230 as the number of the cocoons, all but one or two of which produced perfect insects.—J. E. FLETCHER, Worcester: December, 1882.

Notes on Tenthredinidæ.—On p. 127, vol. xviii, of this Magazine, I recorded *Nematus salicis* as among the species possessing the power known as mixed-parthenogenesis. I should have written *N. melanocephalus*, Hartig. The error

arose from a brace of wrong determinations several years old, when specimens of *N. melanocephalus* were named *salicis*, and actual *salicis* was named *melanocephalus*.

From my experience, it would seem that only a part of the green species of *Nematus* are capable of parthenogenesis—those whose larvæ have green heads varied more or less with dark stripes or blotches, and feed solitarily. The group whose larvæ have the head black and the second and last two segments orange, and live gregariously, have, at least in several trials I have given them, failed to oviposit in a virgin state.

When some two years since I was breeding *Nematus curtispina* from virgin females, I put such a ♀ in a cage together with several males, and placed them in the sun, watching them from time to time during three or four days. In the peregrinations of the creatures to and fro, whenever any males crossed the path of the ♀ they passed her by without seeming to heed her; but their treatment of their own sex was very different. Whenever two or more males met they wheeled about and brought their hind body into collision, appearing to wrench with their cerci the corresponding organs of each other. This they did repeatedly before separating. Sometimes four or five were thus tussling together. The effect was rather ridiculous, the more so, that none seemed the worse for the battle.

During the past season saw-fly larvæ were strikingly scarce. The only exception to this that I met with was *Nematus salicivorus*, Cam., a species usually only moderately common, which was so plentiful here in the autumn that few leaves of any *Salices* were found untenanted by one or two of its larvæ. *N. curtispina*, on the other hand, which is generally the commonest of the solitary-feeding green *Nemati*, was so scarce, that I could only find three larvæ.—ID.

Notes on the Lepidoptera of the Pyrenees in September.—It would appear from a glance through the pages of the Magazine, that British Entomologists have not often visited the Pyrenees, or, at all events, if they have done so, have not recorded in its pages the species they captured or observed; I am, therefore, induced to send an account of those species I met with during a visit there in the beginning of September.

At Biarritz, where I arrived on the 29th August, I found on the coast, owing, in a great measure, no doubt, to its exposed situation, the flora of a somewhat scanty description, and the *Lepidoptera* proportionately limited. Flying over a species of *Erica*, then in flower, I noticed the following *Lycænæ*, viz.: *L. bætica*, *argiades*, and *Alexis*.

Here and there, along the sea-shore, were patches of the spurge *Euphorbia paralias*, off which I took the larvæ of *Deilephila euphorbiæ* in every stage of growth; I found they fed equally well on *Euphorbia amygdaloides*, a common plant in nearly all the valleys of the Pyrenees.

A few miles south of Biarritz, I took several *Rhodocera Cleopatra*, but as I did not again meet with this species, I concluded that it did not occur much above the sea-level in the Western Pyrenees.

I reached Pierrefitte-Nestalas (1665 ft. above the sea) on 1st September, where I remained several days, exploring the valleys in various directions, with the following result:—*Papilio Machaon*, *Pieris Daphidice*, not uncommonly; *Leucophasia sinapis*, generally distributed and common; *Colias Hyale* and *Edusa*, sparingly;

Rhodocera rhamni, *Polyommatus Dorilis*, *Lycæna bætica* (generally distributed, but never common), *argiades*, *Arion* (one specimen only), *Agestis*, *Adonis*, *Argiolus*, *Corydon*, and *Alexis*; *Vanessa c-album*, *urticæ*, *Antiopa*, and *Atalanta*, occurred sparingly; *Melitæa Dia* and *Parthenie*; *Argynnis Lathonia*, *Adippe*, *Erebia Tyn-darus*, *Satyrus Hermione*, *Pararge Mæra*, *Megæra*, and *Ægeria* were all more or less common; a few specimens of *Syrichthus alveus*, *Hesperia comma* and *linea*, completed the list of butterflies.

Callimorpha Hera was not uncommon flying in the bright sunshine; and at rest on rocks, *Gnophos obfuscaria*, *Cidaria immanata*, and *Acidalia degeneraria* were to be met with occasionally.

On one warm evening, at the lamp outside the hotel at Pierrefitte, I noticed the following:—*Selenia lunaria*, *Rumia crataegata*, *Boarmia rhomboidaria*, *Heliophobus popularis*, *Apamea Dumerilii* (Duponchel), and *Steganias permutaria* (Hübner).

On the stone walls in the valley of Lesponne, I found *Polia chi* and *Bryophila glandifera*, and in the crevices, suspended in some numbers, the pupæ of *Vanessa c-album*, and occasionally those of *Vanessa Atalanta* and *Pararge Megæra*.

On the 7th September, I ascended, from the village of Gripp, the Pic du Midi de Bigorre (9439 ft. above the sea). The path is a good one to the summit, and the ascent an extremely easy one. On leaving the valley (about 5000 ft.), butterflies, including *Parnassius Apollo*, *Argynnis Lathonia*, and *Lycæna bætica*, were somewhat numerous, but they very soon diminished in numbers. At 6000 ft. I noticed but one species, viz., *Erebia Manto*, much worn, and a solitary full-grown larva of *Chærocampa porcellus*. Beyond this elevation all insect life seemed to cease.

Although somewhat disappointed from an entomological point of view, in other respects the excursion was an enjoyable one, for on the following morning I witnessed a beautiful sunrise from the top of a mountain, which, from its isolated position, affords one of the grandest views in the Pyrenees.

From the summit, as far as the eye could reach, scarcely a vestige of snow was to be seen in any direction, except on the highest mountains; two days later (12th September), however, the weather became very unsettled, and a complete change came over the scene, the higher slopes of all the mountains being then completely covered with a mantle of snow.

Continuous rain falling in the valleys rendered further collecting out of the question.—A. H. JONES, Shrublands, Eltham, Kent: 17th November, 1882.

On the variation of the sizes of Lepidopterous eggs laid by the same female, and other notes.—Some time ago I corresponded with Mr. W. H. Harwood on the question as to the eggs of *Macro-Lepidoptera* varying in size, and he mentioned instances, chiefly among the "Prominents," where he had observed some difference in the size of eggs laid by the same female; this difference he had been accustomed to associate with the sex of the future imago, the larger eggs being expected to result in female moths, the smaller in male, but I am not aware that he had tested this theory very exactly: he also furnished me with the experience of another entomologist, who had noted that the first-laid eggs of Hawkmoths are larger than those which follow. These observations interested me much, and I meant to pursue them with some care, but so far I have not done what I wished, and all I can now add is this—last June I captured an impregnated female of *Sm. populi*, and, by shutting her up in a large

paper-lined box, managed to secure all her eggs to the number of 230 or thereabouts ; I had removed and given away most of them before she had quite finished laying, but luckily retained a few of the earliest, and when I came to compare these with the last half-dozen that left the ovipositor, the difference in size was immediately apparent, and on measuring them with the micrometer I found the last were just two-thirds of the size of the first : to have made this observation of more value, I ought to have measured the eggs as they came each day (I think she was about five days in getting rid of all her burden), but I did not think of this in time ; neither shall I be able to know which sex of the moth these small eggs would have produced, for having to leave home before the larvæ were full fed, I was obliged to commit them to the care of a youngster whose conscience was not tender on the point of feeding them, so that on my return I found them all dead.

There is another question that has occurred to me, but which I cannot answer for certain ; does a female moth, which from any cause has not reached the usual size of the species, lay the same number of eggs as a full sized moth, her eggs being like herself under full size ? or does she lay a smaller number of full-sized eggs ?

I believe Mr. Harwood and myself both inclined to the latter view. A third question with regard to eggs is this, Do eggs of the same species vary in colour ? or do they always go through the same changes of colour in approaching maturity ? Mr. Buckler and myself have noted a most decided variation in the eggs of *O. antiqua* ; often they are of a dirty whitish hue with central brown spot, but sometimes we have met with batches which were quite reddish-brown all over ; I believe, too, the eggs of *D. vinula* vary considerably in the depth of their brown colouring. I have notes of a few eggs of *H. Sylvinus*, which I once secured ; when laid they were all of a dull white, and most of them remained so, with the exception of a tinge of yellow, which came over one side ; but one egg became deep yellow all over, and the larva from it when hatched was of a much deeper yellow than the rest, but I did not manage to rear it so as to see whether this difference remained throughout its growth. I have also notes of various batches of eggs of *C. brumata*, which did not all seem to go through the same changes of colour, some of them not showing the dark hue which others put on at the last.

The average number of eggs laid by each species is a matter not always to be ascertained easily ; I once counted 1200 as the number laid by *T. fimbria*, and about the same number in a batch laid by *T. pronuba*, and these are the highest figures I ever knew ; something over 200 is I fancy a very general score.

To any one who possesses a microscope the examination of newly-hatched larvæ furnishes a very curious study ; Mr. Scudder, some years ago, pointed out in the pages of this Magazine (vol. viii, p. 122) the value of observations on this stage in the life of an insect, but without going very deeply into the signification of the structure of what he called the "embryonic larva," one cannot but be greatly interested with the details which a magnifying power of 25 or 50 diameters will reveal. Thus, I found that the young larva of *Sm. populi* has its skin thickly set with fine bi-forked hairs, like double fish-hooks, the anal horn being similarly ornamented, whilst the head has only a few simple hairs ; the young larva of *A. alni* has a most curious arrangement of dorsal tubercles on segments 5—8, but this will probably be noticed more at large in a future paper.

Dr. Chapman has fully confirmed my observations on the varying number of

moult undergone by the larva of *O. antiqua*, some individuals change their skin three times, some four times, and others five times ; and he has gone further, and shown that the larva, which is to result in a female moth, has one moult more than the male ; the male larvæ moult either three or four times, the females either four or five times ; we are now anxious to extend this investigation especially among the species that have hairy larvæ, and to try to settle what sort of treatment and surrounding conditions tend to lessen or increase the number of moults in the larva stage ; *A. caja* is a species with a reputation for numerous changes of skin, but being a hibernator is not easy to carry through.

It has been before recorded that the pupæ of some butterflies vary in colour with the object to which they are attached, but Mr. Harwood surprised me a good deal by sending me two pupæ of *Cymatophora Or*, which were quite unlike in colour ; the pupa obtained from a larva captured near Colechester was black, but the pupa sent to him from Scotland was quite reddish-brown ; and this difference he found to exist almost constantly between the English and Scotch pupæ, a very few of the former showing a tendency to the lighter colour.

During the past summer I tried, with Dr. Chapman's help, to settle the origin of the yellow dust in the cocoon of *B. neustria*, but neither of us was able to see the larva in the act of ejecting or applying this yellow paste : I cut open a larva, which had died without spinning, and found two stoutish deep yellow threads in its body, which I conjectured might be vessels meant to secrete this paste, but my knowledge of anatomy is too vague to enable me to speak with certainty.

These notes are very slight, mere hints, indeed, but they seem to me to indicate several lines of research, for which the *Macro-Lepidoptera* offer the best opportunities ; and since butterflies and moths will always attract a very large share of attention from the world of Entomologists, I want to show that beginners can still find ground open to them, in which to make their mark, by filling up records yet left blank after all that has been written by their predecessors.—JOHN HELLINS, Exeter: 19th December, 1882.

Argynnis Dia near Tunbridge Wells.—This insect was taken some years ago by Mr. J. C. Arnold, of Hastings, but the species was not recognised till now. The circumstances under which it occurred were as follows. About the year 1876 Mr. Arnold was collecting a few butterflies and moths, when he observed two small fritillaries flying near each other, and caught them both. He took them home and set them, supposing they were the " Pearl Bordered." But this year taking some " fresh specimens," as he supposed, he threw away one of them, and was about to discard the other, when he observed, to his surprise, that though he had taken both *A. Selene* and *A. Euphrosyne*, the markings of this insect differed materially from both of them. He, therefore, wrote to me to know whether this specimen could be *Argynnis Dia*, since it agreed with Coleman's short notice of that species.

As I had no description at hand, and no specimen of *A. Dia*, I wrote asking him to consult Mr. C. G. Barrett. Mr. Barrett at once answered, that from the description and drawing forwarded, it was almost certainly *Argynnis Dia*. To make sure I wrote to Mr. Meek, who at once forwarded three continental specimens.

The insect captured by Mr. J. C. Arnold agreed with these in every respect, the only difference being that Mr. Arnold's specimen was somewhat faded.

With respect to the time of occurrence, Mr. Arnold tells me he took *Euthemonia russula* and *Argynnis Adippe* the same day, but does not know the date, this would point to the early days of July, or possibly to the latter part of June. The specimen was taken on heathy ground in Sussex, somewhere near Tunbridge Wells. He does not remember seeing any other small fritillaries that day. He does remember that he noticed the dullness of the under-side at the time, but thought it was owing to the specimens having been for some time on the wing. This circumstance makes him certain of the exact locality in which he caught them.

I may add, that I have looked over Mr. Arnold's collection, which consists of the more conspicuous English *Macro-Lepidoptera*—there were no other rarities among them.—E. N. BLOOMFIELD, Guestling Rectory: 26th December, 1882.

[This is not the first time that we have heard of the occurrence of *Argynnis Dia* in this country, though to many of our younger readers the announcement will have all the charm of novelty.

The chance of any error through the transposition of specimens seems precluded by the following considerations:—1st, The captor has never purchased any butterflies at all; 2nd, he has never been abroad, nor received any insects from abroad; and 3rd, he has never exchanged insects.

There is, however, still the possibility of the insect having been accidentally introduced.—EDS.]

Obituary.

George Wailes died at his residence, Gateshead, on the 30th October, 1882, in the 80th year of his age. In him we have lost one of those zealous Entomologists who could speak with the authority of more than 50 years' personal experience.

J. F. Stephens, in his "Illustrations," quotes observations of George Wailes as to the appearance of many insects in the neighbourhood of Newcastle-on-Tyne, from the year 1828 forwards. This would imply that he had been an active collector and observer of insects for some time before 1828.

George Wailes was not prolific as an author, and his Catalogue of the *Lepidoptera* of Northumberland and Durham, which appeared in 1858 in the Transactions of the Tyneside Naturalists' Field Club (noticed in the Entomologist's Annual for 1859, p. 169) was his longest work. His remarks therein on the specific identity of *Polyommatus Artaxerxes* and *Agestis* are of extreme interest; a copious extract of these notes was reprinted in the pages of the Zoologist for 1858, pp. 6278-6281. Hagen, in his *Bibliotheca Entomologica*, only enumerates twelve productions from his pen, but there are several minor notes of his in the early volumes of the Entomologists' Weekly Intelligencer. His very last notice in 1860 on *Bombylius major* reminds us that one of his earliest essays was on the characters of the European *Diptera*, from Meigen's *Systematische Beschreibung*, which appeared in the Magazine of Natural History for 1832.

He certainly excelled as a letter writer, his neat hand-writing, and the amount of geniality he threw into the subject, rendered the arrival of a letter from him an unfailing source of pleasure.

He was a solicitor, and I remember how on one occasion he remarked that in his early Entomological career he had much neglected the smaller moths, but had

excused himself on the plea that "*De minimis non curat lex.*" But afterwards he devoted much attention to the *Micro-Lepidoptera*, and was one of the first to breed the little *Cemiostoma* of the *Genista tinctoria*, now known as *W'ailesella*. For many years he was the Conservative registration agent for South Northumberland.

More than twenty years ago Mr. Wailes began to be afflicted with deafness, and this infirmity increased to such an extent as to debar him from his usual intercourse with his friends. When unable to continue his Entomological pursuits, he turned his attention to horticulture. He was twice married, but had no family.—H. T. S.

ENTOMOLOGICAL SOCIETY OF LONDON: 1st November, 1882.—H. T. STANTON, Esq., F.R.S., President, in the Chair.

Mr. Jenner Weir exhibited two immature examples of a species of *Conocephalus*, found living in Messrs. Veitch's hot-houses. He thought they were probably *C. ensiger*, Harris, an American species.

Mr. Billups maintained that the beetles submitted to him as having caused damage to beer casks in Rangoon, were *Tomicus Saxeseni* (cf. *ante*, p. 120 and p. 144).

Mr. Pascoe exhibited a curious spider's nest from Sardinia; it consisted of a silken bag partially covered with small stones, and was formed close to the ground.

Mr. George Lewis exhibited three species each of the families *Histeridæ*, *Syntelidæ*, and *Lucanidæ*, illustrating his remarks on the *Syntelidæ*, as given in the Ent. Mo. Mag., *ante* p. 137.

Mr. Butler communicated the concluding portion of his paper on the *Lepidoptera* of Chili, collected by Mr. Edmonds: this part comprised *Micro-Lepidoptera*, and supplementary *Noctuidæ*, &c.

December 6th, 1882.—The President in the Chair.

Mr. E. A. Fitch exhibited, on behalf of Mr. Bignell, examples of *Platymetopus undatus*, the new British Homopteron noticed in Ent. Mo. Mag., *ante* p. 155.

Mr. Meldola exhibited a small moth in bad condition, sent by Dr. Fritz Müller, from Brazil, interesting because Dr. Müller assured him that it had been seen to deposit living larvæ, and hence was viviparous.

The Rev. H. S. Gørrham exhibited specimens of *Cryptophagus validus*, found on beer casks in his cellar in Sussex; he had found larvæ feeding on a fungus on the casks, and thought they were those of the beetle.

Lord Walsingham exhibited examples of *Niptus hololeucus*, sent to him from Scotland, and which were reported to have damaged silver plate; at any rate, there were holes in the plate on which the insects were found; he suggested that there might be some corrosive property in the fæces of the insects.

Sir S. S. Saunders exhibited and reported upon fig-insects from Madagasear, collected by the Rev. W. Deans Cowan; the remarkable thing about them was that they only had four legs, the intermediate pair being obsolete. He also read a letter from M. André respecting the terminal segments of *Halticella*.

Professor Westwood communicated notes on M. Giraud's statements respecting the *Eurytomidæ*.

Mr. Cameron forwarded descriptions of ten new species of *Nematus* from Scotland.

Dr. Sharp sent a revision of the genus *Tropisternus* in the *Hydrophilidæ*.

Mr. Meyrick sent an elaborate memoir on the classification of the *Tineina*, in which he attempted to shew that schemes based upon European forms only, will not bear the test of scrutiny, when applied to those of Australia, New Zealand, &c. He also dwelt largely on the importance of structural characters in *Lepidoptera*, as opposed to those ordinarily taken from markings, &c.

January 17th, 1883.—Anniversary Meeting. The President in the Chair.

It was announced that the prize of £50, offered by Lord Walsingham, for the best essay on *Sclerostoma syngamus* (see notice of meeting for October 1st, 1879, vol. xvi, p. 140), had been awarded to Dr Mégnin, of Paris (two competitors); no essay regarding *Strongylus pergracilis* had been received.

The following were elected Members of Council for the ensuing year, viz.:—J. W. Dunning, M.A., F.L.S., E. A. Fitch, F.L.S., F. D. Godman, M.A., F.R.S., Rev. H. S. Gorham, F. Grut, F.L.S., W. F. Kirby, R. McLachlan, F.R.S., J. W. May, K.N.L., F. P. Pascoe, F.L.S., E. Saunders, F.L.S., J. W. Slater, H. T. Stainton, F.R.S., and C. O. Waterhouse.

The following officers were subsequently elected, viz.:—President, J. W. Dunning; Treasurer, E. Saunders; Secretaries, E. A. Fitch and W. F. Kirby; Librarian, F. Grut.

The outgoing President read an address, which was ordered to be printed, and the meeting terminated with the usual votes of thanks to the officers for their services during the past year.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(continued from p. 148).

20. PHORPIA, R. Desv.

Anthomyia, p. Meig., Schin., Macq., Walk.

Aricia, p. Zett.

Chortophila, p. Macq., Rond.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in the males, remote in the females; arista tomentose or bare; face slightly prominent; abdomen depressed, oblong, or linear; alulets small, with equal-sized scales; wings with the anal veins prolonged to the margin; legs black.

1. FLOCCOSA, Macq., Rond.

floralis?, Fall.

2. TRANSVERSALIS, Zett.

3. PUDICA, Rond.

4. DISSECTA, Meig.

5. INCOGNITA, Rond.

6. LACTUCÆ, Bouché.

7. OBSCURA, Macq.

8. MUSCARIA, Meig.

brevicornis?, Zett.

9. HISTRIO, Zett.

10. CILICRURA, Rond.

fusciceps?, Zett.

11. TRICHODACTYLA, Rond.

12. FLORILEGA, Zett.

13. IGNOTA, Rond.

14. CEPETORUM, sp. n.

ceparum?, Meig.

antiqua, p. Schin.

15. NEGLECTA, sp. n.

16. EXIGUA, sp. n.

parva?, Desv., Macq.

This genus contains a rather heterogeneous collection of small flies, including all those black-legged species whose males have contiguous eyes, which cannot be placed in any of the preceding genera.

Several small species are embraced in this group which are very difficult to determine, as they are very much alike, and do not possess any very marked distinctive characters. Several different species have, I believe, been described under the same name, and I think that the same species may have been described under different names; so that it is very difficult to arrive at just conclusions. The females of distinct species are, in some cases, so similar, that it is almost impossible to name them correctly, unless they are found associated with the corresponding males.

P. FLOCCOSA, Macq.

The males of this common species may at once be recognised by the tuft of hairs on the under-side of the base of the hind femora, and by the inner sides of the hind tibiæ being ciliated along the middle part of their inner surfaces with a series of short bristles of unequal lengths. There is but little doubt that this species is the same as the *M. floralis*, of Fallén, Meigen, Zetterstedt, Schiner, and others; for the general descriptions of both species agree together, though none of the last-named authors mention the tufted femora. The face is rather prominent; the eyes (of male) sub-contiguous; the arista pubescent; the thorax marked with three rather broad and widely separated stripes; the abdomen narrow and rather tapering, with a wide, black, dorsal, longitudinal stripe, which becomes narrower towards its extremity, and is more or less dilated opposite the upper margin of each segment, which is marked with a narrow, transverse, black line. The female has the eyes separated by a white, intra-ocular space, occupying about a third of the width of the head, containing a wide central stripe, usually red at its front part, and black behind; but sometimes entirely black. The thorax and abdomen are both lighter in colour than in the male, and are indistinctly striped; the latter is oblongo-ovoid in shape, with the apex pointed.

The larvæ feed upon the stems of cauliflowers and other varieties of the cabbage tribe. I have received specimens of the fly from Mr. Inchbald, bred from the first, and I reared several myself last summer from cabbage plants sent to me by Mr. Dunn, of Dalkeith, in consequence of their being infested with the "grubs of the cabbage-fly."

The larvæ of *A. floralis* are said, by Zetterstedt and Schiner, to feed upon radishes (*Raphanus sativus*), and Winnertz has bred this fly from the roots of *Brassica napobrassica*.

P. TRANSVERSALIS, Zett.

This species has the abdomen oblong, flattened, rather short, covered with soft hairs, and marked along the dorsum with a widish, longitudinal, black band of even width, interrupted opposite the edges of the segments, which are bordered by a whitish line. The thorax is very dark grey, marked with three indistinct, longitu-

dinal, black bands, and has light grey sides. Zetterstedt says that the alulets are "*sordide albideæ*," but I have found both these and the halteres to be usually of an orange colour.

This is rather a local species. I have found it abundantly in a plantation near Bradford, and have received specimens from Mr. Inchbald, which he had bred from the leaves of *Rumex acetosa*, which are mined, or, rather, blotched, by the larvæ.

P. PUDICA, Rond.

This is a pretty, bright-looking fly, about the same size as the last (6 mm. long), but having the abdomen rather more elongated and pointed. The thorax is of a glistening whitish-grey colour, lighter on the front margin and on the shoulders; it is marked by a central black stripe, which only extends along the anterior half, and by two very wide lateral bands, which reach the bases of the wings. The abdomen is of a slight pinkish-grey colour (sometimes glaucous), with a slender, continuous, tapering, longitudinal, black stripe.

The sub-anal male appendages are small. The hind tibiæ are armed with a few bristles towards the upper part of their inner sides. I do not know the female.

Not uncommon.

P. DISSECTA, Meig.

This rare species is characterized by having yellowish-brown wings, sub-contiguous eyes (in the male), a nearly bare arista, a dull, dark grey thorax, with cinereous shoulders, and three, rather indistinct, black stripes, an oblong, flattened, rather narrow, abdomen, of a light grey colour, clothed with numerous soft hairs, and marked with an interrupted dorsal black stripe, formed by four triangular spots, the bases of which are dilated into transverse bands opposite the upper edge of each segment. It has straight, perpendicular, external, transverse veins to the wings, and the male hind tibiæ are armed with a few short bristles of uneven lengths in the middle of their inner sides.

I have not seen a female.

I captured one male at Thorparch, near York, in August, 1878, another at Silverdale, in Lancashire, in May, 1881, and a third near Bicester, Oxon, in June, 1882.

P. INCOGNITA, Rond.

This species, of which I have only seen one British male example, captured by the late F. Walker, closely resembles *P. dissecta* by its brown wings and other general characters, but differs by having a more pubescent arista, narrower cheeks, a more nigrescent thorax, and a narrower abdomen, which is marked with much larger triangular spots, which cover the greater part of the dorsum.

I possess a typical continental male specimen which was named by the late Professor Rondani. I do not know the female.

P. LACTUCE, Bouché.

This species is of a deep rich brownish-black colour with brown wings. The eyes of the male are contiguous, with the frontal triangle red; the arista is pubescent: the cheeks rufous; the thorax with a cinereous tinge on the shoulders and sides; the abdomen is oblong and flattened, of an uniform brown colour, when

viewed from before backwards; but looking of a grey colour with brown reflections, and having an interrupted dorsal stripe, when seen from behind.

This pretty, well-marked species is said to feed, in the larval state, on the lettuce. It appears to be of rather local occurrence. The only place in which I have found it has been a kitchen garden near Buckingham, where I captured several males on several occasions. I have not seen a female.

P. OBSCURA, Macq.

The thorax of this species is black, with the front margin and shoulders glistening greyish-white. The anterior edge is intersected by three, and sometimes four (when the middle one is bifid), abbreviated black stripes, which form two or three irregular, bright, white, spots, giving a peculiar and characteristic appearance to the fly. The abdomen is oblong, rather narrow, flat, and glabrous. It is grey, with a wide, interrupted, black, dorsal stripe, and has three straight, transverse, brown bands, which cover the upper halves of the second, third, and fourth segments. The length is about 4 mm. (2 lin.).

Very rare; I have seen but one male specimen, which I captured near Bradford, in June, 1879.

P. MUSCARIA, Meig.

This is characterized by being narrow, elongated, black, and hairy. The face and epistome are both prominent; the antennæ are very short, the second joint being almost as long as the third, which is short and wide; the palpi are long, hairy, and dilated at their extremities; the thorax and abdomen are indistinctly striped; the latter is very narrow, and thickly clothed with long hairs; the hind femora are very hairy, but the hind tibiæ are bare on their inner sides. These remarks apply to the male, I do not know the female.

Very rare.

P. HISTRIO, Zett.

This, and the two following species, are peculiar by having the hind tibiæ of the males ciliated along the whole length of their inner sides with short erect hairs or bristles. The present fly, which is considerably larger than either of the two following (it being from 7 to 8 mm. in length) has the arista decidedly pubescent; the thorax whitish-grey, marked with a black central stripe (bifid in front), and with two wide, irregular lateral bands. The scutellum has the edges, and sometimes the centre, marked with brown. The abdomen is oblongo-conical, with the apical segment small. It is marked with a narrow, black, longitudinal stripe, as well as with black transverse lines. The wings have the external transverse veins oblique and sinuous. The hind femora are nearly bare of hairs on their under surfaces; and the hind tibiæ have the bristles arranged in a double row along both their inner and front sides; the bristles being of slightly irregular lengths.

This rare species, of which I only know the male, approaches in form, and by its pubescent arista, to those Anthomyids placed in the genus *Hylemyia*.

P. CILICRURA, Rond.

This little species, 4 to 5 mm. (about 2 lines) in length, is of a dark brownish-grey colour, marked on the thorax with three rather indistinct, wide, brown, longi-

tudinal lines. The abdomen is flat and tapering, having a central, longitudinal, black, dorsal stripe, as well as transverse dark lines on the borders of the segments; the latter being only visible in certain lights. The anal segment is small and grey, and the sub-anal appendages of moderate size. The face and epistome are often rufescent, and are both slightly prominent; the eyes are sub-coherent in the male, and widely separated in the female; the latter having the intra-ocular space red at the fore part; the row of bristles on the inside of the hind tibiæ of the male consists of short rigid hairs, placed very near together, and of almost equal lengths. The female has the thorax of a paler brown colour, and is indistinctly striped.

This little fly is generally distributed, and feeds, in the larva state, upon onions. I bred a number of specimens of both sexes last summer, from onion plants, in different stages of growth, which had been kindly sent to me by Miss Ormerod, as well as by Mr. Dunn, of Dalkeith, in consequence of their being infested by the maggots or larvæ of *Diptera*, which were injurious to the onion crops.

I have placed the *A. ruficeps*, of Zetterstedt, as a synonym of *P. cilicrura*, though Rondani thinks that it agrees more closely with *A. angustifrons*, of Meigen; the latter species, however, has a decidedly prominent face, and Zetterstedt says of *A. fusciceps*, "frons parum prominula." The hind tibiæ, again, in *A. angustifrons* (a typical continental specimen of which, named by Rondani, I have had an opportunity of examining), are furnished with much longer and softer hairs than those of *P. cilicrura*; and Zetterstedt says of *A. fusciceps*, "tibiæ posticæ intus pube brevi erecta ciliatæ." I have not seen a British specimen of *A. angustifrons*. I formerly confused it with *P. cilicrura*.

P. TRICHODACTYLA, Rond.

This species very closely resembles *P. cilicrura*, but is usually rather smaller, of a lighter grey colour, and has the thorax less distinctly striped, being often immaculate. The abdominal dorsal stripe is generally interrupted, the separate portions having a triangular shape. The hind tibiæ of the males are armed exactly like those of *P. cilicrura*, but the middle legs present a very characteristic difference, the metatarsal joints being furnished on their outer sides with four or five long curved hairs or bristles. I only know the male.

This little fly is not uncommon, but less frequently seen than the preceding one.

P. FLORILEGA, Zett.

This species closely resembles *P. trichodactyla* in form, colour and design, but has the middle metatarsal joints of the males destitute of long hairs, and the inner surfaces of the hind tibiæ unarmed, with the exception of having two or three short bristles at their upper part. It is about 3 mm. in length, has both the face and epistome slightly prominent, the eyes of the male contiguous, the arista bare, the thorax yellowish-grey, marked with three indistinct brown stripes; the abdomen flat, narrow and tapering, with very small anal and sub-anal appendages; cinereous in colour, and marked with a sub-continuous dorsal stripe, which is quite straight, and of uniform width throughout. I do not know the female.

Not uncommon.

P. IGNOTA, Rond.

This is a well-marked little species, very common in gardens and fields. It is

usually of a shining black colour; the males have large contiguous eyes which nearly cover the whole cheeks; the thorax is mostly immaculate, but in the less deeply coloured specimens three wide black bands may be observed on a brown ground; the abdomen is flat and tapers towards the extremity, when viewed from behind it is grey, having often a glaucous tinge, and is marked with a black longitudinal sub-continuous dorsal band, and with straight transverse lines; the wings are usually somewhat fuscous, having the third and fourth longitudinal veins rather widely separated, and slightly divergent from each other; the external transverse veins are straight and upright; the hind tibiæ of the males are bare on their inner sides.

The female is grey, with the thorax and abdomen indistinctly striped; the eyes widely separated, and the intra-ocular space black, with broad whitish margins.

P. CEPETORUM, *sp. n.*

Mas, griseus, thorace sublineato; abdomen lineare, depressum, cinereum, albonitente, linea dorsali nigra, interrupta, signatum; alæ claræ; tibiæ posticæ intus parce setosæ.

Femina, oculis remotis, abdomine immaculato, apice acuto.

Long. ♂ et ♀, 6 mm.

This species very closely resembles *Hylemyia antiqua*, Meig., and has doubtless been confounded with it. The chief points of difference between the two species are, that the arista is only pubescent in *P. cepetorum*, but sub-plumose in *H. antiqua*; the abdomen is marked down the dorsum with an interrupted stripe in *P. cepetorum*, while there is a fine continuous line in *H. antiqua* ("ununterbrochener schwarzer feiner Rückenlinie");* lastly, the wings are mostly clear in *P. cepetorum*, but brown in *H. antiqua*.

Head: face slightly prominent; epistome flat; eyes of male contiguous; antennæ of moderate length, with the arista thickened and pubescent at its base, but nearly bare in the middle and at the extremity.

Thorax, with the scutellum of a light yellowish-grey colour; the former marked with four indistinct pale brown stripes, and with four rows of black bristles.

Abdomen oblong and rather narrow, cinereous, clothed with black hairs, and showing silvery-white reflections when viewed from behind; it is marked down the dorsum with a row of elongated, narrow, triangular black spots, which form a sub-continuous stripe; the anal segment is grey, small and rather pointed; the sub-anal male appendages are large and hairy.

Wings hyaline, with the third and fourth longitudinal veins nearly parallel to each other, and the external transverse ones straight, and a little oblique; *Calyptra* and *Halteres* both pale yellow; *Legs* sometimes piecous; hind femora almost bare of hairs or bristles at the base of their under-surfaces; hind tibiæ of the males furnished with a few short bristles along the middle and upper part of their inner sides. The female is very similar in colour to the male; the eyes are widely separated, the intervening space being red at its front part; the abdomen is dull grey, mostly immaculate, conical and pointed at the apex; the calyptra are white, and the halteres yellow.

This is "*par excellence*" an onion fly, as all the specimens which I have seen have been bred from the bulbs of that vegetable. I suspect it is the same as that named *A. ceparum* by Bouché, Meigen, and others, which has been mixed up by Schiner with *H. antiqua*.*

I received specimens of this species last summer from Mr. Inchbald, which he had bred from onions, and I also reared several myself from bulbs of the same onions (sent by Miss Ormerod) which produced the specimens of *P. cilicrura*; the larvæ of both species feeding together, and passing through their transformations at the same time. It is very interesting to add, that a short time since I received both males and females of this fly from Professor Lintner of Albany, U. S., which he had bred from onions in America, and which corresponded in all respects with my English specimens, with the exception of having the legs more piceous or testaceous in colour.

P. NEGLECTA, *sp. n.*

Mas, fuscus, pilosus; thorace lineis quinque striato; abdomine angusto, maculis tribus triangularibus, dorso signato; alis venis tertiis quartisque longitudinalibus versus apicibus paulo convergentibus; tibiis posticis intus nudis. Long. 3 mm.

Head: eyes large, covering the cheeks, and closely contiguous; face and epistome only slightly prominent; antennæ rather elongated, the third joint being three times the length of the second; arista thickened along its basal third, where it is almost bare, but having the apical portion a little pubescent.

Thorax, with scutellum, grey, sometimes having a glaucous tinge; it is marked down the dorsum with five stripes, of which the middle and two lateral ones are the widest, the intermediate lines being narrow and sometimes indistinct, when only three broad stripes are visible.

Abdomen narrow and pointed towards the apex, covered with numerous soft black hairs, and consisting of four distinct segments, of which the first is very short, the second longer than any of the others, and the third and fourth about equal in length; it is of a dull grey colour, and marked down the dorsum with three large triangular black spots, the bases of which are transversely dilated opposite the upper margins of the second, third, and fourth segments; the apical joint is very small and pointed, and furnished on its under-surface with two small lamellæ, on the outer side of each of which a small black hook or tooth may be observed, projecting backwards.

Calyptra moderately developed, of a dull yellowish-white colour; *Halteres* orange-yellow.

Wings slightly nigrescent, costal spine wanting; costal vein ciliated at the base; external transverse vein straight and upright; third and fourth longitudinal veins diverging from the site of the internal transverse vein, for three-fourths of the distance to the apex of the wing, and then becoming slightly convergent towards each other; the third longitudinal vein reaching the border exactly at the apex. *Legs,* with the under-surfaces of all the femora, ciliated with a double row of long fine bristles; inner sides of hind tibiæ bare. The female is unknown to me.

This little well-marked species is generally distributed, but not common.

* In a former part of this list I placed *A. ceparum*, Meig., under *Hylemyia tibiaria*, Rond., but I now believe that I was mistaken in thinking that they were synonymous.

P. EXIGUA, sp. n.

Mas, nigrescens, oculis coherentibus; thorace sublineato; abdomine hirsuto, lineari, depresso, cauda incrassata, lineaque interrupta, et incisuris transversis signato; nervis transversis subapproximatis; tibiis posticis intus ciliatis.

Long. 2 mm.

This little species bears a very considerable resemblance to *P. ignota*, the abdomen being marked much in the same way; it differs from it, however, by being smaller, in having the abdomen narrower and more thickened at the extremity, the calyptra smaller, the third and fourth longitudinal veins nearer together and quite parallel, the transverse veins nearer together, and the hind tibiæ ciliated.

Head: eyes contiguous; face and epistome slightly prominent; antennæ rather short, the third joint being scarcely twice the length of the second; arista bare, and with an oval, shining black, thickened protuberance at its base.

Thorax dull schistaceous-grey, with the sides paler in colour, marked with three or five rather indistinct longitudinal black stripes.

Abdomen hairy, oblong, narrow, attenuated at the base and thickened behind; it is marked on the dorsum by a narrow, interrupted, black, longitudinal band, with transverse lines, and a number of small black spots round the roots of the hairs; the apical segment is large, double, projecting, and of an ash-grey colour; the sub-anal processes are large, and consist of two pairs of lamellæ, one pair projecting from the apex forwards, and the other pair (which are placed towards the middle of the belly) extending backwards.

Wings slightly fuscous, with the first and second longitudinal veins, as well as the costa, black and rather thickened; the third and fourth longitudinal veins are placed rather near together, and are quite parallel to each other; the transverse veins are also somewhat close, and the external one is straight and upright; there is no costal spine.

Calyptra very small, and of a brownish-white colour. *Halteres* yellowish-brown and sometimes nigrescent. *Legs*, with the hind femora furnished beneath with short soft hairs along the basal half, and with longer ones towards the extremity; hind tibiæ ciliated with a few bristles of irregular lengths on the middle part of their inner surfaces. *Female* unknown.

I captured several specimens of this fly at Silverdale, Lancashire, in May, 1881.

(*To be continued*).

DILAR JAPONICUS, n. sp.

BY ROBERT McLACHLAN, F.R.S., &c.

♂. *Head*, above, shining yellowish-testaceous, much elevated, with a median longitudinal impressed line; the three piliferous warts very large (the lateral ones the largest), the hairs yellow: *face* shining brownish: *antennæ* pale yellow, about 30-jointed, each joint, from the 3rd to about the 21st, with a strong clavate branch, mostly very long, but shorter towards the base and apex of the antennæ; 3rd joint with an inner tooth immediately below the branch; the 6 or 7 apical joints short and nearly moniliform.

Pronotum yellowish, with two contiguous median tubercles. *Mesonotum* having the lobes broadly fuscous. *Metanotum* yellowish.

Legs yellowish, with concolorous hairs; knees blackish; a brownish mark at apex of tibiae, and the under-side of the tarsi (especially the posterior) is also brownish.

Wings yellowish-grey, very broad, nearly equal in form, the apices almost semi-circular: the anterior pair closely freckled with pale grey spots arranged in many transverse series; towards the extreme base the spots are darker, and there are the usual two blackish horny points, one towards the base below the first sector, the other towards the disc below the 1st branch of the second sector; neuration yellowish with pale hairs; second sector with four principal branches; a well-defined series of gradate nervules extending obliquely from below the 4th branch of the second sector (in addition to the nervules in the basal half of the wing): posterior-wings slightly paler, without grey spots, but with the usual two dark horny points.

Abdomen fuscous, clothed with very long yellow hairs; apex yellow, the incrassate lateral valves very thick, meeting above and below (in the dry insect), leaving a narrow long-oval apical cavity between them; they are clothed with extremely long yellow hairs.

Expanse of wings, 24 mm.; length of an anterior-wing, 11½ mm., breadth of same, 6 mm.

Habitat: Japan (Fukushima in the main Island, 28th July, 1881), 1 ♂.

For this very interesting addition to our knowledge of the geographical distribution of *Dilar*, I am indebted to Mr. George Lewis.

In colour *D. japonicus* much resembles *D. Hornei*, McLach., from N. W. India (*cf.* Ent. Mo. Mag., v, p. 239), but is larger, and the wings are considerably broader and more semicircular at the apex, and have the markings paler; there appears, moreover, to be an outer series of gradate veinlets in the anterior-wings that is not present in the types of *Hornei*. Furthermore, the condition of the abdominal apical cavity is strikingly different, and there is no trace of the superior lamina or lobe seen in *Hornei* (*cf.* figure of apex of abdomen of *Hornei*, Ent. Mo. Mag., v, p. 240).

D. Hornei, japonicus, and no doubt *Nietneri* (unknown to me, *cf.* Hag., Stett. ent. Zeit., 1866, p. 296), differ from the South European forms in the joints of the antennæ being shorter and more dilated, but with much longer and stronger branches; otherwise, they appear to be quite congeneric, and there is a general resemblance rendering specific differentiation difficult.

D. Prestoni from S. America, and *D. americanus* from N. America, differ in their small size and in neuration, and perhaps will be eventually separated generically (*cf.* McLach., Ent. Mo. Mag., xviii, p. 55).

DIPTERA IN ARRAN.

BY G. H. VERRALL.

A fortnight in June spent in the Island of Arran gave me an opportunity of collecting a number of *Diptera*, a list of which may be of interest for geographical distribution. The climate of the Island is wonderfully mild, owing to its receiving the full brunt of the Gulf Stream, hence not so many northern forms occurred even on the mountains, as the high latitude induced me to expect. The *Flora* especially seemed more like that of the south-west of England, as fuchsias nine or ten feet high with stems quite four inches thick, and rhododendrons by many thousands, grew in the woods about Brodick Castle; delicate shrubs flourished in gardens when protected from deer, and laburnums, *Iris pseudacorus*, and a potato-field in the south of the Island close to the edge of the sea show the comparative harmlessness of the storms. The day I ascended Goatfell, the highest point on the Island (2866 feet), there was scarcely a breath of wind even on the summit, and the sea between Arran and Cantire was like glass, while the steamer coming from Glasgow left behind it the ripple of the paddlewheels visible on the calm water for four or five miles, *Diptera* buzzed on the rocks about the summit, and *Coleoptera* ran about between the stones.

My chief attention was given to the *Anthomyiidae*, and I succeeded in getting good series of several species which I had met with before only at Rannoch or Braemar, some of which though common in Scotland, have never yet been recorded as British. Those species which I have clearly identified I will leave at present in the generic divisions adopted by Dr. Meade in his paper now appearing in this Magazine.

Altogether I took between 1200 and 1300 specimens of *Diptera*, belonging to rather more than 200 species; I shall not attempt to describe any new species here, as I consider any I may have found should only be treated more monographically, and any I may be in doubt about I have preferred not to enumerate at present.

I made Brodick (where there is a first class hotel) my head quarters, but I made excursions to Lagg, Loch Ranza, Glen Sannox, Lamash, Corrie, Blackwater Foot, &c., hence I explored most of the Island, and the species I have identified are as follows:—

Nemotelus notatus	Hæmatopota pluvialis	Chrysopila aurata, F.
Microchrysa polita	crassicornis (1)	holosericea, Wlk.
flavicornis		Isopogon brevivrostris
Beris vallata	Leptis scolopacea	Hybos sp.
chalybeata	notata	Cyrtoma 2 sp.

Rhamphomyia nigripes (2)	Machærium maritimum	Lucilia Cæsar
albosegmentata (2)	Sympycnus annulipes	cornicina
geniculata (2)	Campsicnemus curvipes	Calliphora erythrocephala
tarsata (2)	armatus	vomitaria
umbripennis (2)	Medeterus apicalis ? (6)	Mesembrina meridiana
flava (2)	Psilopus platypterus	Graphomyia maculata
Empis tessellata	Chrysogaster metallina	Morellia simplex
livida	Macquarti	hortorum
trigramma	Chilosia variabilis	Cyrtoneura stabulans
vernalis	flavimana	Myiospila meditabunda
sp. ? (3)	albitarsis	Polietes lardaria
Hilara interstincta	chloris	albolineata
maura	antiqua	Hyetodesia lucorum
squalens	sponsa	marmorata
pruinosa	Leucozona lucorum	incana
Hemerodromia melanocephala	Melanostoma mellina	variabilis
Gloma fuscipennis (4)	scalaris	longipes
Tachypeza nubila, Mg.	Platychirus manicatus	umbratica
nervosa, Mg.	peltatus	semicinerea
Tachista annulimana, Mg.	albimanus	errans
cimicoides, Wlk.	clypeatus	signata
Tachydromia = Platypalpus, 3 or 4 sp.	Syrphus 4-lunulatus, Schm. (7)	lasiophthalma
	nigricornis, Ver.	populi
Hygroceleuthus diadema	obscurus, Zett.	Mydæa urbana
Dolichopus atripes	grossulariæ	pagana
vitripennis	vitripennis	impuncta
atratus	nigritarsis ? (8)	Spilogaster nigrinervis
lepidus	annulatus	maculosa
nubilus	cinctus (9)	consimilis
discifer	compositarum	communis
pennatus	punctulatus	Limnophora compuncta
popularis	barbifrons	sororecula
urbanus	Sphærophoria menthastri	contractifrons
simplex	Ascia podagrica	sp. 3 or 4
æneus	floralis	Hydrophoria conica
Gymnopternus cupreus	Sericomyia lappona	Hydrotæa ciliata
ærosus	Rhingia rostrata	occulta
Tachytrechus notatus	Eristalis horticola	irritans
Argyra diaphana	nemorum	dentipes
argentina	arbustorum	palæstrica
leucocephala	pertinax	Rondanii
Syntormon sulcipes, Mg.	Helophilus pendulus	meteorica
ædienemus, Lw.	Xylota segnis	fasciculata
Synarthrus pallipes	Syritta pipiens	Trichophthicus innocua (10)
Rhaphium longicorne	Siphona sp.	hirsutula (10)
Xiphandrium fissum	Sarcophaga carnaria	cunctans
monotrichum	Atropos	Homalomyia manicata
appendiculatum	Cynomyia mortuorum	armata
Porphyrops prærosus, Lw. (5)	Onesia sepulchralis	lepida
tenuis, Ver.	Stomoxys stimulans	serena
		carbonaria

<i>Azelia</i> Macquarti	<i>Chortophila</i> floccosa, Rond.	<i>Bibio</i> lacteipennis
Zetterstedti	villipes, Zett.	<i>Dilophus</i> vulgaris
cilipes	trichodaetyla	<i>Scatopse</i> inermis
gibbera	<i>Scatophaga</i> inquinata	notata
<i>Hylemyia</i> variata	squalida (11)	<i>Rhyphus</i> fenestralis
strigosa	litorea	punctatus
nigrimana	<i>Cælopa</i> sp.	<i>Ptychoptera</i> lacustris
<i>Lasiops</i> Røderi	<i>Psila</i> fimetaria	<i>Limnobia</i> nubeculosa
ctenocnema	nigra	<i>Rhypholophus</i> sp.
<i>Anthomyia</i> pluvialis	<i>Paloptera</i> umbellatarum	<i>Tipula</i> sinuata, F.
radicum	<i>Mycetophila</i> bimaculata	<i>gigantea</i> , Schrk.
	<i>Macrocera</i> lutea	rufina

NOTES.

(1) *Hæmatopota crassicornis*, Wahlb.—I have no doubt we have two common and widely diffused species of *Hæmatopota* in Britain. The distinction is much easier to the eye than to the pen, as the readiest character is the tint of the wing which is marbled-grey in *H. crassicornis* and muddy-yellowish in *H. pluvialis*. Very little can be added to Wahlberg's original distinctions, in which he says, "Differt statura breviori, colore intensius nigricante, nec subfusco, pictura thoracis, abdominisque albida, nec cinerea, maculis alarum albis in lineas subcirculares magis confluentibus—Lineæ thoracis laterales abbreviatæ et interruptæ, sat distinctæ, nec subcontinuæ, obsoletiores. Maculæ abdominis parvæ, rotundæ, distinctæ, nec majores, obsoletæ." I have seen *H. pluvialis* from Lewes and Lyndhurst to Arran, and *H. crassicornis* from Sussex to Sutherland. In Curtis's British Entomology, 525, is figured *H. italica*, from Mersey Isle, Essex, which seems distinct from the other two by its larger size and ochreous femora; Mr. H. Vaughan gave me just such a specimen from near Southend; what species it really represents I cannot say at present.

(2) *Rhamphomyia*.—The whole genus *Rhamphomyia* remains in a most unsatisfactory state, very few species being as yet well identified or described. Of those I record, *R. nigripes* is common and well known; *R. flava*, Fln., is equally well known though less common, the males were hovering about six feet from the ground in considerable numbers in a path through the plantations near Brodie's Castle; the other four species are not in our most recent British lists, though *R. umbripennis* was enumerated in Stephens' Catalogue. The species I have called *R. albosegmentata*, Zett., comes very near *R. nigripes*, F., but has the discal cell alike in both sexes, it seems very common in Scotland, and I have taken it at Lyndhurst, and at Abbott's Wood in Sussex; *R. geniculata*, Mg., is a greyish species, with black legs and pale knees, the female having the legs partly feathered, I feel no doubt it is the *R. geniculata* of Meigen and Zetterstedt; *R. tarsata*, Mg., is a shining black species, with blackish legs, the male having hyaline wings with a conspicuous black stigma, incrassated basal joint of hind tarsi, and large very conspicuous genitalia: the female has the posterior femora and all the tibiæ somewhat feathered; I have taken it at Leigh and at Worcester; I have no doubt it is Zetterstedt's *R. tarsata*, and probably Walker's *R. longipes*, as it seems to agree with a bad specimen so named in the late Mr. W. W. Saunders' collection; Walker says "no stigma," but I expect he named Mr. Saunders' specimen, and I certainly cannot put much value

upon his description; *R. umbripennis*, Mg., is a common small weak species, with dull black thorax (♂), brownish-yellow legs and smoky wings, the female having simple yellower legs.

(3) *Empis* sp. ?.—I caught what I cannot doubt is a pair of a small black *Empis* at Lagg, but the male is most remarkable as one wing has not the fork of the cubital vein which is the sole distinction between the genera *Empis* and *Rhamphomyia*.

(4) *Gloma fuscipennis*, Mg.—Both genus and species are omitted from Walker, though mentioned in Stephens' catalogue, because they were represented in his collection by *Sciodromia immaculata* (v. Walker, Ins. Brit. Dipt., iii, addenda xi). The genus is distinguished from *Hilara* by the long terminal bristle to the antennæ, and from *Brachystoma* (to which I think it most allied) by the shorter anal cell. *G. fuscipennis*, Mg., is the only European species, and seems widely distributed, though rare. The single specimen I caught was in bad condition.

(5) In February, 1876, in my "Notes on some British *Dolichopodidæ*," I described three supposed new species. When sending some specimens to Herr Kowarz last year I enclosed my types for his examination, and I am sorry to say all three species sink as synonyms. The genus *Porphyrops* is still an exceedingly difficult one, which may account for my failure there, while the *Diaphorus* had been described too incompletely. *Porphyrops simplex* = *P. micans*, Mg.; *P. tenuis* = *P. prærosus*, Lw.; *Diaphorus dorsalis* = *D. melancholicus*, Lw.

(6) MEDETERUS.—In my "List of British *Dolichopodidæ*" (Ent. Mo. Mag., ix, 71) I gave only five British species of *Medeterus*, to which I added one in 1876. By the aid of Kowarz's paper on the genus in the Verhandlungen der zool.-bot. Gesellschaft in Wien, xxvii (1878), I can now enumerate the following British species:—

<i>micaceus</i> , Lw.	<i>pallipes</i> , Zett.	<i>flavipes</i> , Mg.
<i>apicalis</i> , var. b., Zett.	<i>muralis</i> , Lw.	<i>jaculus</i> , Mg.
<i>muralis</i> , Mg.	<i>diadema</i> , L.	<i>nigricans</i> , Mg.
<i>melanopleurus</i> , Lw.	<i>rostrata</i> , F.	<i>truncorum</i> , Mg.
<i>tristis</i> , Zett.	<i>carnivora</i> , Fisch.	
<i>apicalis</i> , Zett. (?)	<i>æneivittatus</i> , Mcq.	

To these I expect seven or eight more species may yet be added, and I think I possess at least four not enumerated above, but which I am not yet satisfied about. *M. micaceus* will fall under Mik's genus *Oligochætus*.

(7) This synonym is given on the authority of a letter from Loew, but I do not know where Schummel described the species, nor is it given in Schiner's Catalogue of European *Diptera*.

(8) *Syrphus nigratarsis*, Zett. ?.—I captured one female of a *Syrphus* very near *S. latifasciatus*, Mcq. (= *abbreviatus*, Zett.), but the scutellum is black haired. With considerable doubt I refer this to the little known *S. nigratarsis* of Zetterstedt; I have another female very similar, which was given me by the Rev. H. S. Gorham, who caught it at Box Hill. The species must remain doubtful until more specimens can be obtained.

(9) *Syrphus cinctus*.—This species was not very uncommon, and is readily distinguished from the commoner *S. cinctellus*, Zett.

(10) *Trichophthicus*.—Taking this genus in the sense adopted by Dr. Meade, two species were common in Arran and I expect over most of Scotland, as I caught both at Rannoch and *T. hirsutula* at Braemar and also at Windermere. According to Zetterstedt, their first describer, both are common in Scandinavia. The two species are remarkably alike, and I failed to distinguish the females though specially looking out, and Zetterstedt who took both species *in cop.*, fared scarcely better. The males of both are blackish, the abdomen (viewed from behind) being greyish with a black dorsal line; both have somewhat smoky wings and halteres, and both have the hind tibiæ clothed in front and beneath with longish erect hairs, but in *T. innocua* the hind tibiæ are nearly straight, and their apices with scarcely any noticeable spur beneath, while in *T. hirsutula* the hind tibiæ are curved and have at their apices behind a long conspicuous blunt spur. In *T. hirsutula* the abdomen is lighter grey, and the incisures more darkened.

(11) *Scatophaga squalida*, Mg.—This species was common on the extreme summit of Goatfell (2866 ft.).

The remarkable absences from this list are the whole genus *Clinocera* which I specially looked for, and above all *Musca domestica* which I could not find; I have no doubt it occurs later in the year, as when the house I am now living in was built I could not find *M. domestica* in it until August.

Sussex Lodge, Newmarket:

December, 1882.

FURTHER TROPICAL NOTES.

BY GEO. C. CHAMPION.

Mr. W. D. Pryer's additional "Tropical Notes" (Ent. Mo. Mag., vol. xix, p. 59) have just reached me; and, as they are written chiefly in answer to my observations on the same subject (Ent. Mo. Mag., vol. xviii, p. 214), I will now supplement my previous notes with a few more particulars of my own experiences in the New World.

I think we are both equally agreed as to the exaggerated accounts usually given by travellers of the fauna of the tropical forest (of Central America I have read of enormous blue butterflies nine inches in expanse; the species that do occur become greatly magnified in size), but in speaking of this part of the world, it is impossible to say *that butterflies in particular are never found beneath the forest canopy* (the italics are mine), and it is to these accounts of Mr. Pryer's experiences in Borneo I demurred, as not being applicable to Central America.

The primeval forests of Central America are comparatively open,

and cannot be nearly so dense as in Borneo; again, even in the densest part, trees are constantly toppling over by the roots in the rainy season, or falling from decay, and, if anywhere near a village, the natives are frequently felling, if not for the timber, for honey; so that it is not very difficult, as a rule, to find places where the sun will penetrate. In these openings many butterflies will be found, as species of *Nymphalidæ*, *Heliconiidæ*, *Morphidæ*, &c. In the densest parts of the forest, I have found not a few species of *Satyridæ*, three species of *Heteræ* (including a beautiful transparent-winged species), *Taygetis*, &c. These insects especially occurring about the long, upright, stilt-like spiny roots of various species of palms; and, wherever the sun can penetrate a little, various *Euptychiæ* and other small species of the same family, also *Leptalis*, *Heliconius*, *Mechanitis*, small *Lycænidæ*, &c. The immense species of *Caligo* and *Brassolis*, the *Ithomiæ*, and some other *Heliconiidæ*, *Hades noctula*, and many *Satyridæ*, seem to avoid the sun altogether, occurring in places where it seldom, if ever, penetrates, and a few, especially the first-named, appear to be crepuscular, flying about sunset. The splendid blue *Morphos*, and the white *M. Polyphemus* (also in Guatemala), are to be found chiefly in openings in the forest, where they seem to sail along the pathways, lazily flapping their wings, seldom settling and seldom coming within reach of the net.

In the rainy season (April to December), butterflies are generally scattered throughout the forest, but in the dry season (January to March), nearly all the *Pieridæ*, *Papilionidæ*, *Nymphalidæ*, and *Hesperiidæ*, and some *Erycinidæ*, congregate about the banks of the nearly dried up rivers and streams, and one may hunt for them almost in vain elsewhere at this period; the *Satyridæ*, and most of the *Heliconiidæ* and *Morphidæ*, however, keep to the shady forest. In February and March I have seen hundreds of butterflies of very many different genera, *Papilio*, *Callidryas*, *Terias*, *Junonia*, *Megalura* (many species), *Catagramma* (ditto), *Callicore*, *Adelpha*, *Synchlœ*, *Colænis*, *Libythea*, *Agraulis*, *Phyciodes*, *Eubagis*, *Siderone*, *Paphia*, *Apatura*, many *Hesperiidæ*, &c., congregated about the river banks, both in the virgin forest and in the open second growth woods, or "rastrojos;" some of these settle for a few moments on the boulders, or in wet places, but always in the very hot sun, and are exceedingly difficult to secure; others (chiefly species of *Papilio*, *Callidryas*, *Terias*, *Megalura*, and *Phyciodes*) congregate, 50 or even 100 examples together, in one little spot not a foot in circumference, and the whole of them may sometimes be captured by one sweep of the net.

In one little spot near here, the margin of a partly dried up river in the forest, I have captured upwards of sixty species of butterflies (including at least thirty-five genera), and the greater part may be seen, if not caught, any very hot sunny morning during the latter part of February and beginning of March: it is true that many of the species are not represented by many individuals, still, a few are in plenty. Though one may collect nearly every day in the year, still this abundance of butterflies lasts a comparatively short period, not longer, perhaps, than in the temperate zone; as soon as the rains commence in April they soon disperse, yet the *Pieridæ* (*Callidryas*) may be seen flying in troops along the river banks nearly all the year, and *Megalura* and some *Hesperiidæ*, for several months, congregating in large numbers in one spot.

I have observed in the Polochic Valley in Guatemala, at the end of the dry season (April), a similar abundance of butterflies (though, perhaps, not quite so many species as here in Chiriqui), some fine *Papilios* (especially a beautiful green and black species) being very common amongst others, and all congregated in one little spot on the sandy banks of the Rio Polochic. In the forests on the mountain slopes (3000—5000 feet), even in the densest places, I have taken *Hetæræ*, *Taygetis*, *Oxeoschistes*, and *Ithomiæ*, and, wherever an open space occurred, various *Leptalis*, *Euterpe*, *Phyciodes*, *Pieridæ* (*P. tenuicornis*, common in Chiriqui), and *Satyridæ*, and more rarely a *Papilio*, *Clothilda*, or *Paphia*.

Some butterflies appear to avoid the forest altogether, as the *Danaidæ*, *Anartia*, *Agerona*, *Victorina*. The *Acrææ*, various *Papilio*, and *Thecla*, many *Hesperiidæ* (*Pyrrhopyge*, *Eudamus*, &c.), some few *Heliconiidæ*, &c., but odd examples will occasionally be seen with forest-loving species on the banks of the river in the virgin forest, in the dry season.

In Central America, an ordinary traveller will notice, I believe, ten times more butterflies in the dry season than at any other time of the year; not, perhaps, because more species are to be found at this period, but because they are concentrated at every damp spot, when the forests are utterly dried up, and many of the trees leafless.

One is far more disappointed with the Coleopterous fauna of the forests of Central America than with the *Lepidoptera*. The majority of the species, with some few striking exceptions, are very insignificant in appearance, and scarcely any finer than those of Europe, but this cannot be said of the butterflies.

For the past month or so, few butterflies have been visible in the

forest, beyond the usual *Morphos*, *Caligos*, and *Heteræ*, but now that the rains are nearly over, more species are to be met with daily, and next month, when the mud and water begin to dry up a little (the forest is little better than an immense swamp at this season), still more species will be found.

To conclude, I must say I believe that such numbers of butterflies (of species there can be no comparison) congregated as are noticed by Mr. Bates and other naturalists in South America, and to be seen frequently in Central America in the dry season, are very seldom, if ever, to be seen outside the tropics; in the State of Panamá alone, there are probably more species than in the whole of Europe. I regret, in the foregoing remarks, I am only able to particularize a few genera, and not having any books whatever by me, have no means of determining species here at this moment.

Bugabita, Chiriqui, Panamá :

November 23rd, 1882.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871 ;

WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(continued from p. 201.)

ANISOTOMIDÆ.

ANISOTOMA MACROPUS, Rye.

This species may be distinguished from all but *A. Triepkii*, by having its posterior femora suddenly and obliquely contracted towards the trochanter; it is smaller, longer, narrower, and less convex than *A. Triepkii*. Taken by Mr. Champion, near Claremont, Surrey (Ent. Mo. Mag., x, 133).

ANISOTOMA BRUNNEA, Sturm.

This species is entirely ferruginous, shining, with a narrow club to its concolorous antennæ, of which the apical joint is not narrower than the preceding; its thorax is not sinuate on each side at the base, and the striæ on its elytra are fine, with small and closely packed punctures. Taken by Mr. Lawson near Scarborough (Ent. Mo. Mag., ix, 135).

ANISOTOMA CURTA, Fairm.

In the same section as *A. dubia*, from which it may be distinguished by its rather longer build, the much stronger punctuation of its thorax, the sides of which are more contracted behind, and by the apical joint of its antennæ being distinctly not as wide as the penultimate joint. Taken by the Rev. T. Laundry Brown near Norwich, and by Mr. Champion at Esher (Ent. Mo. Mag., xii, 150).

ANISOTOMA SCITA, Er.

This species apparently comes very near *A. dubia*, but its tibiæ are less dilated at the apex, its thorax is widest at or very near the base (instead of nearer the middle), and thence is narrowed to the front: it is also lighter in colour. Taken near York by Mr. Hutchinson, and recorded, with some reservation, by Mr. Rye (Ent. Mo. Mag., ix, 158); it seems to be a doubtful species.

ANISOTOMA CLAVICORNIS, Rye.

There is a single specimen of this species in Dr. Sharp's collection taken in flood rubbish near Dumfries. It is distinguished by its antennæ, which are very short, gradually widened towards the apex, with the 4th, 5th, and 6th joints unusually small, and the apical joint, though short, as wide as the two preceding, which are very transverse (Ent. Mo. Mag., xii, 150).

ANISOTOMA PALLENS, Sturm.

This species is readily distinguished from *A. furva* and *A. ciliaris*, the two others of its group, by its smaller size, the much finer and less close punctuation of its thorax, and by the finer punctuation of the striæ, and much less close punctuation of the interstices of the elytra, the outer margins of which are not set with short cilia. Three specimens taken by Mr. J. J. Walker at Deal (Ent. Mo. Mag., x, 135).

ANISOTOMA LUNICOLLIS, Rye.

Of the average size of *A. calcarata*; chiefly distinguished by its strongly rounded thorax, of which the usual anterior angles are entirely, and the posterior angles almost entirely, obliterated; it is more oblong than *A. calcarata*, and its antennæ have a smaller club. Taken by Mr. R. Lawson near Scarborough (Ent. Mo. Mag., viii, 203).

Hydnobius spinipes, Gyll.

This species, recorded as British by Mr. Rye in Ent. Mo. Mag., viii, 204, is afterwards given up by him, the specimen in question being only a highly developed male of *H. strigosus*.

SILPHIDÆ.

Colon Barnevillei, Kr.

This species, mentioned in Ent. Mo. Mag., xii, 177, is apparently only an undeveloped form of *C. Zebei*, Kr.

Adelops Wollastoni, Jans.

This species must be referred to the genus *Bathyscia*, Schiödte, and not to *Adelops*, Tellkamp.

PHALACRIDÆ.

PHALACRUS BRISOUTI, Rye.

This species is nearly allied to *P. coruscus*, but differs from this species in its average smaller size, rather lighter coloured fore-legs, tarsi, and antennæ; the club of the antennæ also serves to distinguish it, being rather broader and not so long,

with the apical joint conspicuously broader and shorter, and not so acuminate. Taken at Lee by Mr. Rye, and at Gravesend by Mr. Champion (Ent. Mo. Mag., ix, 8).

Phalacrus Humberti, Tourn.

This insect, recognised as a good species in Ent. Mo. Mag., ix, 37, is abandoned in Ent. Mo. Mag., xii, 177, as being only a small variety of *P. coruscus*.

Olibrus affinis, Sturm.

It is probable that the insects standing in collections under this name ought to be referred to *O. particeps*, Muls., but the point does not seem quite to have been cleared up (Ent. Mo. Mag., ix, 38).

Olibrus bicolor, F.

This is apparently not a British insect, our insects standing under this name being all *O. liquidus*, Er.; the true *O. bicolor* is a larger, rather less elongate, and more convex insect.

Olibrus helveticus, Tourn.

A single specimen of this species is recorded in Ent. Mo. Mag., xii, 177; the species of the genus in many cases run so closely one into the other, that further confirmation of this insect seems to be required.

NITIDULIDÆ.

Carpophilus sexpustulatus, F.

This is a very doubtful, and probably introduced, species.

MELIGETHES MOROSUS, Er.

There is considerable confusion as to this species; it comes very near *M. memnonius*, Er. A specimen returned to me by one of the chief British authorities on the genus, as not agreeing with any he possessed, was afterwards named for me on the continent as *M. morosus*, Er.; *M. morosus* is rather shorter than *M. memnonius*; but, otherwise, there appears to be very little difference between them. Mr. Rye, in Ent. Mo. Mag., x, 138, says that M. Ch. Brisout de Barneville considers that *M. memnonius* is intermediate between *M. difficilis* and *M. morosus*, or, perhaps, a variety of one of them.

MELIGETHES OCHROPUS, Sturm.

Allied to *M. difficilis*, Heer, but readily separable from all its allies by its comparatively broad and short-oval form, and stronger convexity, and especially by the outer margin of its posterior tibiæ not being rounded, but dilated in almost a straight line until the lower third, where it is suddenly and obliquely contracted (Ent. Mo. Mag., ix, 156).

Meligethes Kunzei, Er.

This insect seems to be a variety of *M. difficilis*, rather than a separate species.

MELIGETHES INCANUS, Sturm.

This insect is of the size of ordinary *M. oratus*: it is of exactly oval outline, dull, closely and finely punctured, and clothed with very evident, depressed, grey hairs. One specimen taken by Mr. G. R. Waterhouse in Darenth Wood, on *Echium vulgare* (Ent. Mo. Mag., viii, 268).

M. maurus, Sturm.

This species must be crased from our lists, all the supposed British exponents of it being identical with *M. oratus*, Sturm. (Ent. Mo. Mag., viii, 267).

M. palmatus, Er.

This species, according to M. Brisout, is the male of *M. obscurus*, Er. Mr. Rye adopts this synonymy: some authorities consider *M. palmatus* to be identical with *M. distinctus*, Sturm, a species not recognised at all by M. Brisout.

MELIGETHES PICTUS, Rye.

This species is conspicuous in having each elytron ornamented on the disc with a more or less sharply defined red spot; its form, the serration of the tibiæ, and its long legs, also serve to distinguish it: according to M. Brisout, it is identical with *M. mutabilis*, Rosenhauer, which is considered a variety of *M. brevis*, Sturm. (Ent. Mo. Mag., viii, 74, 269).

TROGOSITIDÆ.

Trogosita mauritanica, L.

This species must be referred to *Tenebrioides*, Pillar, and not to *Trogosita*, Olivier.

CUCUJIDÆ.

CATHARTUS ADVENA, Waltl.

This species has been omitted from the British list, as being only an importation; it has, however, been taken under circumstances that would seem to show that it has become thoroughly naturalized, and that it has a better claim to be admitted than many other species.

CRYPTOPHAGIDÆ.

Cryptophagus pilosus, v. PUNCTIPENNIS, Bris.

This variety, which has been considered a good species by some authorities, differs from the type in having more oval elytra, of which the pubescence is longer, and the punctuation coarser and not so close, especially at the base. Taken in the Cambridge fens, and on the Braid Hills, Edinburgh, in each case from a straw shed (Ent. Mo. Mag., viii, 158).

CRYPTOPHAGUS SUBFUMATUS, Kr.

This species resembles *C. validus*, Kr., being nearly as large, but narrower, especially in the thorax, of which the anterior callosities are more distinctly prominent. One specimen taken in the London district (Ent. Mo. Mag., xii, 178).

Cryptophagus grandis, Kr.

This species is apparently synonymous with *C. populi*, Payk, and, therefore, must be omitted.

CRYPTOPHAGUS PARALLELUS, Bris.

This species comes close to small examples of *C. dentatus*, Herbst., but cannot be confounded with any other member of the genus by reason of its narrow, elongate, and parallel form. Taken in Scotch fir by Dr. Sharp and Mr. Rye, at Rannoch (Ent. Mo. Mag., viii, 158).

Cryptophagus Waterhousei, Rye.

This species is only a large and peculiar form of *C. acutangulus*, Gyll., and must, therefore, be omitted.

ATOMARIA BADIA, Er.

Allied to *A. elongatula*, Er., but is rufo-ferruginous in colour, with a transverse impression at the base of the thorax, and broader, and somewhat more strongly punctured elytra (Ent. Mo. Mag., viii, 74).

ATOMARIA ATRA, Herbst.

Allied to *A. fuscata*, but is darker, with a longer, more convex, and more laterally rounded thorax, and stronger punctuation on the elytra, which are more acuminate behind in outline (Ent. Mo. Mag., viii, 135).

ATOMARIA DIVISA, Rye.

This rests as a species on a single specimen in Mr. Rye's collection with no locality. It is a very distinct species, nearer *A. nigripennis* than anything else in our lists, but differing from that insect in its shorter and more convex build, longer thorax, with a scarcely visible basal transverse depression, &c. (Ent. Mo. Mag., xii, 178).

(To be continued).

The Yorkshire Catalogue of Lepidoptera.—For some years, Mr. G. T. Porritt, F.L.S., of Huddersfield, assisted by the leading entomologists of Yorkshire, has been engaged upon a catalogue of the lepidopterous fauna of that county. The work has now been completed, and is to appear in the "Transactions of the Yorkshire Naturalists' Union," and the MS. has been placed in the printers' hands by the secretaries of that body. The list is very complete—probably, the best county list ever yet published,—and includes about two-thirds of the British species, that is, 1344 out of 2031. Full attention has been paid to the somewhat voluminous literature of the subject, as well as to information contributed by correspondents, the result being a very satisfactory summary of what is at present known.—WM. DENISON ROEBUCK, Sunny Bank, Leeds: *February, 1883.*

DESCRIPTIONS OF THREE NEW SPECIES OF *PAPILIO*.

BY H. GROSE SMITH.

PAPILIO FULLERI.

Upper-side dark brown. Both wings crossed from near the middle of the anterior-wing to the inner margin of the posterior-wing by an irregular band of olivaceous-yellow spots; five on the anterior-wing distinct, those on the posterior-wing confluent, intersected by the nervures. Anterior-wing with three spots towards the apex, the middle spot the smallest, the other two spots bifid; a spot within the cell next the sub-costal nervure, and near the upper disco-cellular nervure. Posterior-wing with a row of ten small spots in pairs near the outer margin, and three larger spots between the median nervures. All the spots of same colour as the band.

Under-side as above, but much paler, and tinged with red from near the centre, deepening towards the base. Posterior-wing with a round black spot on the pre-costal nervure, a black line between the costal and sub-costal nervures, and a black spot at the base. Exp. $3\frac{3}{4}$ inch.

Hab. Camaroons (Fuller); in the collection of H. Grose Smith.

This species is between *Latreillianus* and *Ucalegon*, but is distinct; from the former principally in the colour of the spots and the markings on both sides of the posterior-wing, from the latter in the situation of the spot in the cell and in the double row of spots round the outer margin of the posterior wing.

PAPILIO DIOPHANTUS.

Upper-side dark brown. Anterior-wing broader and not so curved on the costal margin as in *Helenus*, which it resembles on the upper-side. Posterior-wing with a tail more spatulate than in *P. Helenus*, and tipped with cream colour, marked from the costal margin to the third branch of the median nervule by a large cream-coloured spot, divided by the nervures into four parts, the lowest much smaller and more lunular than the other three parts.

Under-side: anterior-wing with longitudinal rays of pale brown, narrowing from the centre of the wing to the interior margin to a band of same colour as the spot. The posterior-wing has at the base of the costa, and between the costal and sub-costal nervures, two broad lines of red, the latter nearly twice as long as the former, the large spot as above continued across the wing to the inner margin by a narrow band of lunular spots of same colour; there is a small spot of same colour at the anal angle, and another at the tip of the tail, the lunular spots between the nervures on the margin are more strongly marked than on the upper-side.

Exp. $4\frac{1}{4}$ inch.

Hab. Sumatra (Bock); in the collection of H. Grose Smith.

PAPILIO FORBESI.

Upper-side dark brown, almost black, the margins between the nervures with lunular white spots, very narrow on the anterior-wing, much broader on the posterior-wing, which is without tails. Anterior-wings with longitudinal rays on each side of

the nervures of light brown, extending from the middle to the exterior margin. Posterior-wing with a row of three brownish-grey lunular spots between the median nervures, and a spot at the anal angle, above which is a row of three small faintly marked spots of same colour.

Under-side: anterior-wings rayed as above, but paler. Posterior-wing with a longitudinal red spot at the base, divided by the precostal nervure, which is black, and a small red spot below the costal nervure, a broad band of ochreous-yellow with a row of black spots in the middle, extending across the wing between the median nervures, and a small spot of ochreous-yellow beyond; a black spot at the top of the band next the anal angle, three blue spots near the exterior margin from the costal nervure to the median nervure.

Exp. 4 inches.

Hab. Bandang Agang, Sumatra (Forbes); in the collection of H. Grose Smith.

This species belongs to the *Memnon* group, in which, however, there is nothing which resembles it.

London: February, 1883.

A marine caddis-fly.—In the report on the condition of the sea-fisheries of the south coast of New England, Washington, 1873, pt. i, p. 379, a phryganid larva in its case is noticed by me. The larva was found on the piles of a wharf at Menemsha. This is a bay in Martha's Vineyard Island, distant about a dozen nautical miles from the shore of Massachusetts. The small island has no river and no creek to speak of. Menemsha Bay is a real rock-pond among the rocky parts of Gayhead, connected with the sea. The only insects found there are the larvæ of *Chironomus oceanicus*, Pack., and a larva in a case similar to that of the European *Molanna*; so I recognised it at once. The larva, one-third of an inch long, was alive and in good condition. Although only one specimen was collected at the time, there is no doubt that it has to be considered as a marine animal, the more so as there is scarcely a possibility of its having been imported from fresh water. As I had no separate copies of the paper, and as it is not likely to come into the hands of an entomologist, the fact has been overlooked, but Mr. McLachlan's interesting paper induces me to draw attention to it.—H. A. HAGEN, Cambridge, Mass., U. S. A.: January 11th, 1883.

[My notes, to which Dr. Hagen refers, appeared in Ent. Mo. Mag., xviii, p. 278, and xix, p. 46, and were published in detail in the Journal Linnean Soc., Zoology, vol. xvi, pp. 417—422. I was not unprepared to hear that some indication of "a marine caddis-fly" had previously appeared. Miss Clarke, of Boston, who honoured me with a visit last summer (and who is an enthusiastic student of the habits of Trichopterous larvæ), told me she thought a notice of a marine caddis-fly had been published in one of the American Fisheries Reports, but the information was too vague, and no citation of the important notice has (so far as I know) appeared elsewhere. So I am the more obliged to Dr. Hagen for this note. *Molanna* seems to me just the genus one might suspect of including marine species, and it is possible that the New Zealand genus (*Philanissus*) may be allied.—R. MCLACHLAN.]

Acherontia Atropos taken at a bee-hive.—A specimen of *A. Atropos* was caught in the month of May, 1861, by my friend Mr. Lloyd, of Badminton, flying in the open daylight in front of his bee-hives, and apparently trying to enter one of them. He knocked it down and secured it, and finally impaled it on a large shawl pin, in which condition it refused to die, as he says, for several days.

It is now in the collection of my son Robert, and, considering that he set it some months after its capture, and taking into account the rough treatment it received from one who loves bees and hates their enemies, and its being left to die in the manner I have stated, it is a very respectable specimen of a fine female of *Acherontia Atropos*.

My son, who is a real lover of the science of entomology, has noticed this last season, that the male of *Pieris rapæ* has a distinct scent when alive. My eldest boy took a specimen of *C. jacobææ* in my garden, almost as black as *Odezia chærophyllata*.—C. MATHEW PERKINS, Sopworth Rectory, Chippenham: January 27th, 1883.

Hydrilla palustris and *Pieris Daplidice* at Cambridge.—Last July, Mr. Chas. K. Baker, of 72, King Street, Cambridge (and formerly master of the King Street Schools, in that town), was good enough to show me the collection of butterflies and moths formed by him in that neighbourhood some years ago. Amongst them was a fine specimen of *Daplidice* taken by him near Newmarket on the 5th August, 1868, also three *Lalia cænosa* bred from larvæ taken by him at Wicken. An unset *Noctua* also attracted my attention as being a species unknown to me. This he very kindly allowed me to take away and identify, and a comparison with the specimen in the late Mr. Allis's collection in the York Museum, showed me at once that it was a ♂ *Hydrilla palustris*, a conclusion which Dr. Battershell Gill has since verified. Mr. Baker has been so exceedingly kind as to give me both the Bath white and the *palustris*, for which I must here repeat to him my best thanks.—A. F. GRIFFITH, Sandridge, St. Albans: January 30th, 1883.

Notes on Lepidoptera in Roxburghshire, season 1882.—The season of 1882 appears to have been throughout the country one of the most barren, with regard to numbers of *Lepidoptera*, experienced for many years. Following a mild and open winter, such a result might have been anticipated, and, judging in the same way the two seasons preceding, following hard winters with much snow, being very prolific, the obvious effect of the character of the seasons in reducing or preserving species is very marked. Larvæ also appeared to be equally scarce during spring and autumn. I have repeatedly noticed a peculiar variety of the larvæ of *Smerinthus populi* feeding on *Populus nigra* in a particular locality, each segment, excepting the 1st, 2nd, and 12th, having a rather large, purplish blotch just above the spiracles, and I have kept a few pupæ from these for observation. The group of *Noctuæ*, especially during June and July, were very sparingly represented, the autumn species being more numerous, but very deficient by comparison with average seasons. There were, however, a few exceptions, a few species appearing in numbers much as usual, notably, *Trachea piniperda*, *Plusia v-aureum*, &c., and among *Geometræ*, *Eupithecia pygmæata*; a beautiful variety of *Epunda lutulenta* occurs in the district, and also of *Ypsipetes elutata*, the latter having the fascia white. Excepting a few species, all

the groups of *Macro-Lepidoptera* were very scarce; *Micros* appearing not to suffer to the same extent, although in both groups I have added species which I had not formerly taken here. Among the former, *Demas coryli*, bred from larvæ on sloe and sawallow, and, although scarce, it appears pretty generally distributed in the district. *Aspilates strigillaria* I found pretty commonly in one locality, and took a good series in fine condition, and of *Eupithecia satyrata*, *exiguata*, *sobrinata*, and *tenuiata*, the latter very abundantly; I also took some beautiful fresh specimens of *pygmæata*, but at that time a course of boisterous and wet weather followed, and although I saw many specimens they were all more or less weather-beaten, and so, of little value. Of *Micro-Lepidoptera* I took the following: *Tortrix icterana*, *viburnana*, *Xanthosetia hamana*, *Argyrolepis enicana*, *Amphysa gerningiana*, *Halonota trigeminana*, *Spilonota suffusana*, *Cnephasia politana*, *Pamplusia monticolana*, *Dicrorampha Petiverella*, *Ochsenheimeria Birdella*, *Pleurota bicostella*, *Gracilaria tringipennella*, *Coleophora albicosta*, *Lithocolletis Spinoletta*, and *Pterophorus Bertrami*. Mr. Barrett has identified all the species enumerated.—A. ELLIOT, Laurieston, Jedburgh, N.B.: January 15th, 1883.

NOTE.—I reared a fine series of *B. quercus*, var. *callunæ*, the larvæ being fed exclusively on poplar and hawthorn.—A. E.

Destruction of Saturnia carpini by parasites, &c.—In the spring of 1880, I collected from heather, in this locality, somewhere about fifty cocoons of *Saturnia carpini*, the most of which presented an abnormal appearance, being very much discoloured, others had a small hole ent out of the side of the cocoons, these being quite empty. The perforated cocoons have been torn open, probably, by mice, and the pupæ extracted, being quite empty, no remains of pupa or larva-skin being visible. Two of the cocoons contained a dead moth-pupa and a smaller rounded reddish pupa, being the pupa of a *Musca*; and the cocoons, with a mass of maggots at the bottom, produced *Cryptus fumipennis*, and plenty of the females of *Pezomachus insolens*, which were named by Mr. J. B. Bridgman. In one of the pupæ which was not quite normal in appearance, were three or four rather large white larvæ which I unfortunately destroyed. In the following July, I think, when crossing the same piece of heather, I picked up one or two discoloured cocoons, which, upon opening, I found to contain a yellowish cellular substance, from which some *Diptera* were just emerging in the perfect state. To give an idea of the extent of destruction from the causes mentioned, I may state that out of nearly fifty cocoons only three or four contained a healthy pupa of *Saturnia carpini*.—ID.

Entomology in the Isle of Harris, &c.—I spent a few days at the end of last September at Tarbert, in the Isle of Harris, and although the entomological results of my trip are very scanty, I thought that any records from so little known a locality, might be interesting.

In *Lepidoptera* I found *Leucania impura*, a dark and worn female, *Larentia didymata*, *Cidaria testata*, *Peronea ferrugana*, *Ecophora pseudospirella*. In *Hymenoptera*: *Myrmica ruginodis*, *Bombus Smithianus*, and *pratorum*, *Pezomachus Kiesenwetteri*, *fasciatus*, and *agilis*. In *Trichoptera*: *Molanna palpata*, *Anabolia cænosa*, *Halesus digitatus*, *Limnophilus marmoratus*, *Plectrocnemia conspersa*, and

Tinodes luridus. In *Neuroptera*: *Potamanthus marginatus*. In *Coleoptera*: *Carabus clathratus*, *Geotrupes mesoleius*, *Antherophagus pallens*, *Helobia Gyllenhali*, *Pterostichus vitreus* and *nigritus*, *Notiophilus palustris*, *Trechus minutus*, *Hydroporus atriceps*, *Ilybius angustior*, *Agabus bipustulatus*, *Colymbetes bistratus*, *Gyrinus minutus* and *natator*, *Calathus fuscus*, &c. In *Hemiptera*: *Gerris Costæ*, *Corixa variegata*, *fossarum*, var. *prominula*, *mæsta*, *Fabricii*, *Sahlbergi*, *Salda saltatoria*, *Ulopa ericæ*, *Velia currens*, &c. In *Diptera*: *Bibio pomonæ* and *clavipes*, *Simulium reptans*, *Hydrophorus nebulosus*, &c. I was surprised at not seeing a honey-bee nor grasshopper. At Tobermory, in the Isle of Mull, I captured *Gerris odontogaster*, *Cymatia Bonsdorffi*, *Corixa Scotti* and *Sahlbergi*, *Cychnus rostratus*, and *Staphylinus erythropterus*. On Ben Nevis I took *Acidota crenata*, *Hylurgus pini-perda*, *Corixa sodalis* and *Wollastoni*, *Nemoura nitida*. At Nairn: *Hydræcia nictitans*, *Agrotis nigricans*, *Eristalis pratorum* and *nemorum*, off flowers of ragwort. —C. W. DALE, Glanville's Wootton, Sherborne, Dorset: *February*, 1883.

Coleoptera in Kent.—In spite of the very limited time at my disposal, I managed to do a little collecting in the neighbourhood of Erith during the past season, and met with a few things worth recording. Of these, the best were *Prionus coriarius*, of which a fine male example was brought to me, and *Hylotrupes bajulus*, of which I took two specimens in close proximity to the railway station. A single example of *Corymbites metallicus* was brought to me, together with several other things of lesser value.

During the early summer *Chrysomela lamina* was very abundant, as, rather later on, were also *C. Banksi* and *C. distinguenda*; *C. Banksi* was especially abundant, as, upon one occasion, I took over a hundred specimens in the course of half-an-hour. An old crab-shell, with a few remnants of flesh adhering to the interior, produced *Silpha thoracica* and various *Histeridæ* in swarms, and *Aleochara lata* was occasionally to be found under carrion on the marshes.

Among some things captured at Margate earlier in the year, I find a single specimen each of *Ilyobates forticornis* and *Homalium Allardi*.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood, S.E.: *February*, 1883.

Obituary.

Benjamin Cooke died at Southport, Lancashire, on the 3rd February, aged 66. Of his very early life we know nothing, but, if we mistake not, he was educated at the Friends' School, at York, having had as school-fellows several well-known British Entomologists, some of whom survive him. Subsequently, he was engaged in a house of business in Manchester, from which he retired only a few years ago. Mr. Cooke was a collector of all Orders of British insects, and proved himself to be a student of them also. Latterly his attention had, perhaps, been more concentrated upon *Hymenoptera* and *Diptera*. He was a frequent contributor of notes to most of the Natural History and Entomological periodicals for many years past; there are few vols. of this Magazine without interesting notes from his pen. He was associated with the Entomological Society of London from the year 1865. His decease leaves a blank in a large circle of entomological friends and acquaintances, especially in the North of England.

ON THE SPECIES OF EUROPEAN CRAMBI ALLIED TO
C. PINELLUS.

BY GEORGE T. BAKER.

Judging from experience, it is not improbable that many collectors in Switzerland pass over, by mistake, some of the *Crambi* allied to *pinellus*. The following short description of those European species which are brown or orange-brown, with a central white longitudinal stripe once or twice transversely divided may, therefore, be useful. (The transverse band excludes the *margaritellus* and *furcatellus* group, which is reserved for another paper).

Our group may be tabulated for convenience thus :—

A. Longitudinal stripe divided once only.

pauperellus, conchellus, pinellus, mytilellus.

Hue of ground unicolorous, stripe dull cream-colour ... *pauperellus*.

Ground colour more or less darkly shaded, stripe shining white...
conchellus.

Ground colour almost unicolorous, an oblique white curved line
beyond the longitudinal stripe *mytilellus.*

Such curved line wanting *pinellus.*

B. Longitudinal white stripe twice divided.

myellus, speculalis, permutatellus, luctiferellus.

Ground colour cinnamon, the two transverse bands oblique but
straight, with an orange shade *myellus.*

With a brown shade..... *speculalis.*

Hinder transverse band waved..... *permutatellus.*

Ground colour dark olive-brown..... *luctiferellus.*

PAUPERELLUS, Tr. (25 mm.).

Fore-wings ochreous-brown, with a pale ochre or cream-coloured longitudinal stripe, which is of a narrow wedge-shaped form, narrowest at the base, where it starts from the centre of the wing and is continued nearly to the hind margin; beyond the middle it is divided by an oblique transverse band of the same hue as the ground colour, in some specimens the hind margin of the posterior division is shelved off so as to be nearly parallel with this band. The fringe is whitish, with a dark dividing line. The hind-wings are uniform brown-grey with whitish fringes, having a dark dividing line as in the fore-wings.

Head, palpi, and antennæ pale ochre-brown. Thorax same colour as the upper wings. Body as the hind wings.

I have not taken this insect myself, but it is not uncommon in the Jura range, and I have also had specimens sent me from Hungary.

CONCHELLUS, Schiff. (26 mm.).

Fore-wings reddish- or cinnamon-brown, yellowish by the inner margin, with a shining white longitudinal stripe, once obliquely divided with red-brown. The ground colour is in some specimens slightly darker along the anterior and hind margins of the stripe, forming a darkish curved transverse shading nearer the posterior border, which is edged by a distinct dark line. The stripe is shining white, and nearly reaches to the hind margin of the wing, it is divided about the middle by a reddish-brown band; the anterior division is narrowly wedge-shaped, the posterior an ovate rhomb, which sometimes is a distinct rhomboid, and at others the angles are so rounded off as to leave an ovate spot, at the anal angle of this division there is a distinct tooth. The fringes are white with dark intersections, and having a dark dividing line.

The hind-wings are light brownish-grey, with a very fine dark marginal line; fringes white, divided by a dark line.

Head, collar, and central part of thorax white; palpi brown, edged above with white; antennæ brown; patagiæ reddish-ochre; and the body is of the same colour as the hind-wings.

During the last week of June, 1880, my friend Dr. Jordan and I found this insect common at Zermatt, flying about the meadows on the Riffelberg, and last year it was very abundant in meadows near the Chalets not far from the Findelin Glacier.

The *a. ab. rhombellus* of Zeller has the posterior division of the white stripe of a distinct rhomboid.

PINELLUS, Linn. (20—23 mm.).

This is the only one of Div. A. found in England, and is accordingly well known. The ground hue of the fore-wings varies much in its intensity, from a pale yellow rust-colour to bright yellowish-cinnamon. As in the former species, there is a longitudinal white stripe, once divided by an oblique band, but the anterior wedge-shaped portion is much broader proportionately, and the hinder part more distinctly rhomboidal, its anterior margin being nearly parallel with the anterior margin of the wing, while in *conchellus* it slopes distinctly downwards. The wedge-shape part of the stripe is, at its termination, rather nearer the fore edge than the rhomboidal division, over which it appears to rise. The rhomb is bordered on the anterior and hind margins by a more or less distinct dark line, and its hind and basal margins are somewhat parallel, sloping from above downwards towards the base of the wing, but the anterior and inner sides somewhat diverge, owing to the posterior outline of the rhomb being much longer than that by the division. The ground colour of the wing is more or less distinctly shaded with darker brown, which is marked in the deeper outline of the hind division of the stripe, above the anterior margin of which there is a dark streak, and beyond it is a curved dark line, sometimes followed by a lighter one, reaching to the anal angle of the rhomboidal division which it borders. The hind margin is edged by a dark dotted line. The fringes are reddish, slightly intersected with dark patches, and having a dark dividing line.

The hind-wings are pale brownish-grey, with a fine marginal line of a darker hue ; fringes are grey, with a faint divisional stripe.

Head, and central part of thorax, white ; palpi reddish-brown, edged above and beneath by a white line ; antennæ brown ; patagiæ pale cinnamon-yellow ; the body being of the same colour as the hind-wings. Specimens from the Amoor country differ but little from our own ; the ground-colour is, however, paler, the white stripe is generally edged above, in its entire length, by an almost black line, and the dark stripe above the posterior division is much more marked.

This species can be easily recognised from the preceding by the hind divisions of the stripe being more distinctly rhomboidal, the wings much less unicolorous, and by its smaller size.

I have not yet met with this in Switzerland. In this neighbourhood it is not uncommon at Sutton Park, about 8 or 9 miles from here, and may generally be taken towards the end of July.

MYTILELLUS, Hb. (21—24 mm.).

The fore-wings of this species are darker than in any of the foregoing, the ground-colour being ochre-brown, and the ♀ being decidedly lighter than the ♂. The longitudinal stripe is shining white, divided by an oblique band of the same hue as the ground-colour, the anterior division of which is wedge-shape and the posterior a rhomboid, but the anal angle thereof is rounded off so as almost to make it a triangle with one side curved. Beyond the central stripe, which is sometimes bordered above and on each side with black, the posterior division having also a small dark streak above it, there is an oblique curved white line reaching from the costa almost to the inner margin. The fringe is shining ochre-brown, with a dark dividing line.

The hind-wings are brownish-grey, with paler fringes, divided by an indistinct line.

Head, and central part of thorax, white ; palpi brown, edged above with white ; antennæ and patagiæ cinnamon-brown ; the body is of a similar hue as the hind-wings.

This is easily known from the previous species by its darker colour, and the white transverse line beyond the longitudinal stripe.

This hardy little insect prefers pine woods to meadows, and is found at a considerable elevation. We have taken it at the end of June frequently, among the pines on the Riffelberg at Zermatt, at a height of about 6000 feet.

B. MYELLUS, Hb. (22—26 mm.).

The anterior-wings are yellowish-ochre, more or less shaded with red, with the white longitudinal stripe reaching nearly to the hind margin, twice divided by oblique bands of a reddish hue, the posterior division of which is almost linear and nearly parallel with the hind border of the wing. The ground colour surrounding the stripe on the anterior and outer margins is darker, being shaded with red, and above the second and third divisions are two streaks of a still darker reddish-brown, the

upper one being shorter than the lower, and touching an indistinct light tooth just in front of the apex of the wing. The hind margin is darkly dotted. The fringe greyish-brown, with white intersections, and having a dark dividing line.

The hind-wings are pale grey, with whitish fringes that have an indistinct dividing line.

Head, collar, and central part of thorax, white; palpi brown, bordered on the upper side with white; antennæ reddish-brown; patagiæ pale ochre; body of the same colour as the hind-wings.

I have this very pretty species from Switzerland, and have also had it sent me from Heidelberg.

This is the only one of Div. B which has been recorded as British, a few specimens having occurred in Scotland. Thus, in the Entomologist's Annual for 1869, p. 126, one specimen is stated to have been taken "near Aberdeen" and another "in Scotland," without any more precise locality being given. Dr. F. Buchanan White (Ent. Mo. Mag., viii, p. 70) mentions having taken it at Braemar, and Mr. Warrington records its capture at Rannoch, at p. 113 of the same volume.

SPECULALIS, Hb. (25—27 mm.).

The ground-colour of the fore-wings is uniform cinnamon-brown, with the white longitudinal stripe twice very obliquely divided, above the second division of which is an indistinct dark streak, there is also a light tooth just in front of the apex of the wing; the inner edge of the wing is bordered by a narrow white stripe for about a third of its length from the base, the hind margin is finely dotted with black, the fringe being brown with white intersections, and having the usual darker divisional line.

The hind-wings are brownish-grey, with whitish fringes, divided by a dark line as in the fore-wings.

Head, and central part of thorax, white; palpi brown, edged with white above; the antennæ and patagiæ are of the same colour as the fore-wings; the body rather darker than the hind-wings.

This species is closely allied to *myellus*, but may be recognised by the uniform brown of the upper wings, by the stripe being more obliquely divided, and by its larger size.

This is again a hardy species, as I have found it up to about 6000 feet; it is not so common at Zermatt as some of the preceding, but still by no means rare. I have generally taken it in the meadows on the Riffel in company with *conchellus*. In the third week of June, 1880, we also took it in the Saas valley, where, on account of being very much shut in, we found all insects earlier than in the Visp valley. It is decidedly a commoner insect than the preceding species, with which it is so closely allied.

PERMUTATELLUS, H.-S.

As I do not possess an example of this species, I will give a translation of

Heinemann's description, but must draw attention to the fact, that it is entirely comparative with *catoptrellus*, Z., which he (Heinemann) considered a good species, but which Staudinger and Wocke catalogue as *a. ab. of specularis*. The description (of *catoptrellus*) seems to be made from a single specimen taken in the Austrian Alps, and it agrees so very closely with *specularis*, that it is necessary to repeat it here:—"Fore-wings cinnamon-brown, with a slightly shining white longitudinal stripe, very obliquely divided with two transverse brown lines, the hind oblique line and the hind division of the longitudinal stripe waved.

"Head and thorax cinnamon-brown. 5 lin.

"The fore-wings are narrower than in the preceding species (*catoptrellus*, *specularis*, &c.). widening less posteriorly, of a uniform pale cinnamon-brown, the inner margin narrowly white to beyond the middle. The longitudinal stripe likewise narrower, the transverse lines little darker than the ground-colour, very narrow and still more oblique, the posterior one, as also the hinder part of the longitudinal stripe, distinctly waved, in the fold rather further from the inner margin than from the anterior transverse line. The middle spot of the stripe with distinct angles, the sides towards the base and inner margin of equal length, that towards the costa perceptibly longer. The fringes a little paler, intersected with white in cells 3 to 5.

"Austria, from the Wasrigel Alps, end of July."

LUCTIFERELLUS, Hb. (25 mm.).

The anterior-wings are olive-brown, much darker in some specimens than in others, the white longitudinal stripe is once obliquely divided, the anterior portion being short and narrow, and increasing but little in width, the hinder part being of a rhomboidal shape, the apical angle of which is very acute and the anal distinctly toothed, beyond this is a white curved oblique line extending from the costa just in front of the apex of the wing to the inner margin, the middle portion appearing in some specimens as almost a continuation of the longitudinal stripe; above the posterior margin of the hind division, nearly touching the costa, is an irregular whitish mark; there is also an indistinct white line between the stripe and the inner margin, which (margin) is bordered by a white line once interrupted for about half its length. The hind border is edged with black.

Hind-wings greyish-brown, the fringes being of the same hue as the wings, with a darker dividing line, the upper ones being also intersected with white.

Head, palpi, thorax, antennæ and patagiæ olive-brown, and the body similar in colour to the hind-wings.

As the ♀ differs somewhat from the ♂, it will be necessary to enumerate the divergencies, which are as follows:

The ground-colour is paler and the longitudinal stripe wider, the white of its posterior division not unfrequently extending quite up to the inner margin, so that this edge is distinctly bordered with white almost to the transverse curved line, which is also wider than in the ♂, the whitish mark by the costa is larger, and is followed by another very indistinct one nearer the base of the wing. The fringes are white, with a dark dividing line, those of the anterior-wings having dark intersections. Head, and central part of thorax, white; palpi brown, edged above with white. The remainder is similar to the ♂.

I have never taken this very handsome *Crambus* myself. All the

specimens were taken in the Swiss Alps, and I notice that Zeller in his catalogue of the *Chilonidæ* and *Crambidæ* says they are found at about the line of perpetual snow, which would mean at an elevation of something over 9000 feet.

a. var. LUCTUELLUS, H.-S. (22 mm.).

The ground-colour is clear olive-brown, with the white longitudinal stripe widening perceptibly outwards, *twice* divided, the middle part of which has four distinct angles, the anal one being toothed; there is also a white tooth on the costa in front of the apex of the wing. The inner margin is edged, with one interruption, with white for about two-thirds of its length, and the hind margin bordered by a dark line.

Hind-wings brownish-grey; fringes dirty white, with a dark dividing line, those of the fore-wings being intersected with white.

Head and palpi brownish; antennæ and patagiæ olive-brown; body similar to the hind-wings.

I have described these in their order according to Standinger's catalogue, but it seems to me that the correct position of *luctiferellus* is immediately after *mytilellus*, as its white stripe is only *once* divided, and it has the white curved oblique line beyond as in that species, and the ground-colour is also more similar to *mytilellus*.

Again, its variety *luctuellus* has the stripe *twice* divided, so that this species evidently forms the connecting link between those *Crambi* that have the longitudinal stripe once divided, and those that have the same with two divisions.

Augustus Road, Edgbaston:
January 3rd, 1883.

DESCRIPTION OF THE LARVA OF *PAMPHILA LINEA*.

BY WILLIAM BUCKLER.

Of this long-wished-for larva I had the great pleasure to receive six fine examples on the 11th of last June, from Mr. W. H. B. Fletcher, who, most kindly mindful of my desiderata when finding himself at their locality in the eastern division of Sussex, on the evening of the 9th, succeeded in sweeping them from *Holcus lanatus*, a very soft pubescent grass, with which they assimilated both in colour and texture most remarkably well.

They had evidently done moulting, and continued feeding well on the above-mentioned grass from seven to fourteen days, and seemed rather to prefer it to *Brachypodium sylvaticum*, another soft-haired grass, which they also ate freely enough while the experiment suggested itself to me, during a part of the time, from the circumstance of my having a few years ago gathered some of it containing, quite by chance, a spun-up pupa, that shortly after produced this butterfly.

Their movements were very sluggish, and after eating a considerable quantity of food, they very slowly began one after another to enclose themselves within two, or sometimes three leaves of the grass, joined together longitudinally by lacing or spinning, with white silk, the edges more or less close to each other, and became completely hidden ; the earliest spun itself up on the 18th of the month, another on the 20th, and the others during the next three days.

The perfect insects, full-sized specimens, were bred on the 15th and 16th of July following.

The full-grown larva is 10 lines in length, its general figure of moderate substance, is stoutest in the middle of the body, and tapers a little from the thoracic segments towards the head, which is globular and projecting, larger than the second segment which is remarkably small and short ; it tapers also gradually on the last four or five segments when seen from above, and when viewed sideways the back then appears to be slightly arched and sloping gradually to the anal flap, and this is a trifle flattened and rounded off behind ; the belly is flat and the legs are all well beneath it and rather short ; the segmental divisions are very delicately defined, also most particularly the sub-dividing transverse wrinkles, which by no means arrest attention unless diligently sought for : in colour the head is of a rather deeper green than that of the body, and rough with minute points, the upper lip of a pinkish hue is smoother and deeply channelled, the ocelli black ; the body above is of a tender and delicate light green ground-colour, without any gloss, and on the thoracic segments the skin is besprinkled with black points of extreme fineness, so that they do not affect the delicate colouring of the green ground ; the dorsal stripe is the darkest marking of green, and is very narrow on the second segment, and from thence uniformly wider until near the end where it becomes very gradually attenuated on the anal flap ; this dorsal stripe is of a darker, rather bluish-green, having a stoutish line of paler green running through the middle, and bordered outside in stronger contrast by a stout line of still paler green than the ground ; the sub-dorsal line is of the same pale green but thinner ; below, at a little distance, the trachea shows partly through the skin and on it can be discerned the rather prominent reddish flesh-coloured spiracles ; below these again, at a little distance, follows an inflated paler stripe of almost creamy-whitish, extending round the anal flap, which often hides the belly and legs from view when the larva is in repose, but at other times, when examined beneath, these are seen to be wholly green, excepting a transverse patch of white on front of the ventral surface of the eleventh and twelfth segments.

On tearing open the coarse reticulation of white silk which held the leaves together, and formed a lining to the oblong puparium an inch and a quarter long, I found the pupa itself to be of the length of $8\frac{1}{2}$ lines and very similar in form to that of its congener *Actæon*,* having the end of the trunk lying free from the abdomen, held in position, head upward, by an oblique cincture behind the thorax, and the anal tip secured by a fan-like spread of fine hooks at the extremity fixed in the silk lining, but the head had the frontal tapering beak shorter and more bluntly pointed, the colour then was the same light green as that of the larva, of which the paler lines could still be faintly traced.

Emsworth: *March 10th*, 1883.

A NEW BRITISH SPECIES OF *CRABRO*—*C. KOLLARI*, DAHLB.

BY EDWARD SAUNDERS, F.L.S.

Mr. Billups has been fortunate enough to capture two males of this interesting species near Headley, and I find a male in my own collection, which was originally in Shuckard's, mixed with *C. interruptus*, De G., = *Lindenius*, Shuck., but without note of locality. It very closely resembles *interruptus*, and the other yellow-banded species, but may be easily distinguished by the sculpture of the mesothorax, which is strigose behind and at the sides, but punctate in front across the middle, whereas, in *interruptus*, it is transversely strigose in front; from the other yellow-banded species the male may be known by its simple antennæ and tarsi and the sculpture of the thorax. The ♀ has not yet been taken in this country, so far as I know, but Dahlbom says that it agrees with the ♂ in sculpture; both sexes are rather smaller than *interruptus*: it may be briefly characterized thus:

Crabro Kollari, Dahlb., Hym. Eur., i, p. 415.

Head and thorax black, mandibles piceous at the apex and bifid, the teeth rather shorter than in *interruptus*. Antennæ simple, basal joint yellow, with a black line above. Prothorax with two yellow spots. Mesothorax punctured, with striæ diverging from the base, which leave a space on the anterior margin, which is simply punctured, and in which are two short earinæ originating from the anterior margin. Wings darker than in most species. Abdomen with lateral spot on the 2nd to 4th segments, and an entire band on the 5th and 6th, apex of the 5th and 6th and the entire 7th dark. 7th segment simple, not deeply impressed longitudinally as in *interruptus*, beneath brown, shining; legs with the femora spotted with black behind, the posterior pair entirely black; tibiæ more or less spinose.

Length, 10 mill.

Holmesdale, Upper Tooting:
14th *March*, 1883.

* *Ide Ent. Mo. Mag.*, vol. x, p. 87.

NOTES ON NEW BRITISH COLEOPTERA SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(continued from p. 233.)

LATHRIDIIDÆ.

Lathridius pini, Mots.

This is synonymous with *L. lardarius*, De G., and, therefore, must be erased.

Lathridius angulatus, Mann., and *L. angusticollis*, Humm.

There seems to be great confusion with regard to these two species: most collections contain plenty of so-called *L. angusticollis*, but not a single specimen of *L. angulatus*. One specimen of the latter is mentioned in Ent. Ann., 1867, 100, as in Mr. Wollaston's collection: it would seem, however, that in reality *L. angulatus* is a common British species, and that *L. angusticollis* is doubtfully British. The true *L. angulatus* is easily recognised by its elytra being studded with silky upright hairs arranged in rows, while *L. angusticollis* has glabrous elytra; traces of pubescence may be observed on quite fresh specimens, but this presents quite a different appearance to the pubescence of *L. angulatus*, which is very marked. M. Belon, of Lyons, who has kindly helped me with this point, says of some supposed type specimens of *L. angusticollis* (given me by one of the leading British Coleopterists), that they are most certainly *L. angulatus*, and he also says that he has received several specimens of *L. angulatus* from England, among them one wrongly named *L. angusticollis*. I have examined a number of supposed specimens of this species, and have not been able to find a single specimen of the true *L. angusticollis* among them, nor do I know of one in any collection with which I am acquainted.

Lathridius undulatus, Mots.

This is synonymous with *L. angulatus*, Mann., and must, therefore, be omitted.

Coninomus constrictus, Humm.

This species seems to come almost too near to *C. carinatus* to be retained as separate (L'Abeille, 249, 57). There seems to be only one British specimen known: this is in Mr. Rye's collection.

Enicmus minutus, Linn.

This very variable species seems to cause great confusion: there is a large dark form with almost quadrate thorax, which certainly seems to be a distinct species, and a short while ago I received a very curious minute form from Mr. Billups. M. Belon has corroborated both these forms as belonging to *E. minutus*; the great variation of this and other species of the *Lathridii* accounts for the numberless species that have been made and demolished by different authors.

CORTICARIA OBSCURA, Bris.

Allied to *C. serrata*, Payk., from which it differs in its rather larger size, and flatter and less oval build; it has a larger club to its antennæ, and the sides of the thorax are less rounded; the elytra have very light punctures and striæ. Taken by Mr. Rye and Mr. Champion in Richmond Park, 1871 (Ent. Mo. Mag., vii, 274).

Corticaria linearis, Payk. ?

I have two *Corticariæ* from Mr. Matthew's collection, which M. Belon has returned to me as unknown to him, but as near *C. linearis*. The species belonging to this group are very numerous, so I am unable at present to say which these two insects belong to.

Melanophthalma Wollastoni, Wat.

This insect (which occurs in abundance at Mablethorpe, where it was first taken by Mr. Wollaston) is apparently a variety of *M. transversalis*, Gyll., which is a very common insect on the continent, as it is here.

BYRRHIDÆ.

SYNCALYPTA HIRSUTA, Sharp.

Closely allied to *S. setigera*, Ill., but with much more coarsely punctured thorax and lighter coloured antennæ and legs; the erect setæ are longer, thinner, less clubbed, and lighter-coloured, and the depressed scale-like hairs on the thorax, are much longer (Ent. Mo. Mag., viii, 151).

PARNIDÆ.

PARNUS STRIATELLUS, Fairm.

This species may be readily distinguished from its allies by its much smaller size and the strong punctured striae of its elytra. Taken by Dr. Power, at Norwich, and by Mr. Champion, at Chobham (Ent. Mo. Mag., xiv, 70).

LAMELLICORNIA.

There has been considerable confusion as to the synonymy of *Geotrupes stercorarius* and its allies: the following appears to be the probable solution of the difficulty:—

G. spiniger, Marsh., = *G. stercorarius*, Erichs., = *G. mesoleius*, Thoms.

This species has the abdomen longitudinally smooth in the middle.

G. stercorarius, Linn., = *G. putridarius*, Erichs.

This species has the abdomen entirely punctured and pubescent.

G. foveatus, Marsh., Steph.

This is probably a myth; or, if anything, it is, perhaps, a hybrid between the above (Ent. Ann., 1874, 96).

GEOTRUPES PYRENÆUS, Charp.

Allied to *G. vernalis*, L., but differs from it in being more shining, and narrower in proportion to its length, and in having the hinder angles of the thorax less obtuse and rounded; in the ♂ the teeth on the under-side of the tibiæ are five or six in number, instead of being at least eight, as in *G. vernalis*; the thorax is visibly punctured on the sides only (Ent. Mo. Mag., viii, 10).

Aphodius niger, Panz.

The supposed British examples of this species are only specimens of *A. plagiatus*, L., without the red markings on the elytra, so the species must be erased from the British list.

APHODIUS MELANOSTICTUS, Schupp.

This species comes near *A. inquinatus*, Fab., but, as a rule, is conspicuously larger with more developed limbs; it has the sides of the thorax entirely reddish-testaceous, and the markings resemble very closely those of *A. tessulatus*, Payk. Taken by Mr. Chappell in the Manchester district, and recorded by Mr. Rye (Ent. Mo. Mag., xv, 280).

PSAMMOBIUS PORCICOLLIS, Ill.

This insect has already been inserted in our lists (Ent. Ann., 1865, 70) on the authority of a single example in Mr. Kirby's collection, mixed with *P. sulcicollis*; it was, however, struck out, but must again be inserted, having been found in small numbers at Whitsand Bay, Cornwall, by Mr. J. J. Walker (Ent. Mo. Mag., xii, 62 and 108). It is larger than *P. sulcicollis*, with scarcely any trace of oblique ridges, and no large punctures, at the back of the head; it has a more ample thorax, and more strongly sulcated elytra, which are more coarsely punctured.

BUPRESTIDÆ.

Trachys nanus, Fab.

The insects that stand under this name in our collections are not *T. nanus*, Fab., but *T. pumila*, Ill., and the latter name must be substituted for the former (Ent. Mo. Mag., xii, 226).

EUCNEMIDÆ.

THROSCUS CARINIFRONS, De Bonv.

This species somewhat resembles *T. dermestoides*, L., from which it may be distinguished by its eyes being divided considerably beyond the middle by a narrow horny plate, by its thorax being (in the male at least) flatter, and very suddenly sinuously contracted towards the front from the lower third; by its more acuminate elytra and less stout tibiæ. Taken by Mr. Wollaston, Mr. Matthews, and others. I have received it from Mr. J. J. Walker (Ent. Mo. Mag., viii, 135).

Cerophytum elateroides, Latr.

The specimens on which this species rests are so few and so doubtfully authentic, that it had better be omitted. Dr. Power, who possesses one of the specimens, endorses this opinion.

ELATERIDÆ.

CARDIOPHORUS RUFIPES, Fourc.

A single example of this insect was taken by Mr. John Dunsmore in 1875 on Corkendale Law, the highest peak in Renfrewshire. It is smaller than *C. asellus*,

shining black in colour, finely pubescent, with the antennæ entirely black, the femora and tibiæ reddish-testaceous, and the tarsi pitchy, with the base of each joint and the claws red (Ent. Mo. Mag., xii, 227).

SYNAPTUS FILIFORMIS, Fab.

This genus was accidentally omitted by Dr. Sharp; it comes between *Agriotes* and *Sericosomus*, and may be at once distinguished by its third tarsal joint having a large membranous appendage beneath, which covers the fourth joint, which is very small.

DASCILLIDÆ.

Microcara (Helodes) Bohemanni, Thoms.

This is now regarded as a variety of *M. livida*, and not as a separate species; it is smaller than the type, with the side margins of the thorax more raised, and less evident costæ on the elytra; it is also rather lighter in colour (Ent. Mo. Mag., ix, 154).

Cyphon pallidiventris, Thoms.

This is apparently the female of *C. nitidulus*, Thoms., and cannot, therefore, be retained as a separate species (Ent. Mo. Mag., ix, 154).

CYPHON PUNCTIPENNIS, Sharp.

Allied to *C. variabilis*, but shorter, broader, and more convex, and distinguished from all the varieties of this species by its extremely short, fine, and scanty pubescence; its elytra also are more sparingly punctured generally, although more closely punctured at the base. Dr. Sharp says that this is the species referred to in his Catalogue as *C. nigriceps*, Thoms., but that it is quite distinct from this. It has been taken at Rannoch and one or two other Scotch localities. Dr. Power has a long series of *C. nigriceps* which are certainly not *C. variabilis*, and perhaps are the true species. If they are identical with *C. punctipennis*, in all probability *C. nigriceps* will have to be omitted from the British list (Ent. Mo. Mag., ix, 155).

MELYRIDÆ.

DASYTES NIGER, Linn.

This very distinct species differs from all the others of its genus in having its thorax transverse, and its elytra very finely and closely punctured, and in its black colour. Taken by Mr. Champion, myself, and others in the New Forest (Ent. Mo. Mag., viii, 84).

LYMEXYLONIDÆ.

LIMEXYLON NAVALE, Linn.

This genus differs from *Hylecætus* in having longer antennæ; its anterior coxæ are approximated instead of being far apart, and it has six ventral segments, and not seven, like its kindred genus. Taken in Cheshire by Mr. Sidebotham and also by Mr. J. Chappell, who has been most generous in distributing it to collectors (Ent. Mo. Mag., ix, 158).

(To be continued).

ON TWO OF THE SPECIES OF *GELECHIA* WHICH FREQUENT OUR SALT-MARSHES.

BY H. T. STANTON, F.R.S.

Professor Zeller, in 1843 (Stettin. ent. Zeit., 281—283) pointed out how it might so chance that an author should begin by describing an insect from one species, and then, a few years later, add some finishing touches to his description from a totally different species; for he showed us very clearly that Linné, in 1746, in the First Edition of the *Fauna Suecica* (before names were yet given) correctly described our present *Plutella cruciferarum*, with “Habitat in Hortis oleraceis,” and “volitat juxta terram,” but in the second edition of the *Fauna Suecica* (1761) with the name “*Xylostella*” came the new habit: “Habitat in *Lonicera xylostei* foliis,” and the total omission of the “Hortis oleraceis” and the “volitat juxta terram,” slight verbal omissions and alterations in the description also tending to show the new bias in the author’s mind.

Six years later Linné, in the 12th Edition of the *Systema Naturæ*, continued the “Habitat in *Lonicera xylosteo*,” but added “in *Cheiranthi floribus*.” The description, however, is so touched up and altered as to apply solely to the insect long known as *harpella*, Hübner, *dentella*, Fabricius, &c., and for which I have myself preferred to retain the Linnean name of *xylostella*, leaving for the “kitchen-garden insect, which flies near the ground” the more appropriate name suggested by Zeller, in 1843, of *cruciferarum*.

We seem in the process, which must have passed through the mind of Linné, to see a new form of *evolution of species*!

I have been led to the foregoing reflections by finding myself rather in a difficulty, when seeking to ascertain which of two coast-frequenting species of *Gelechia* was the original *instabilella*.

It is now 37 years since Douglas wrote the description of *Anacamptis instabilella*, which appeared in the *Zoologist* for 1846, p. 1270. We there read that “this insect was by no means uncommon on the salt-marshes, near St. Osyth, Essex, in July, but when they rose from the herbage the wind blew so strongly, that it was no easy matter to catch them. It is a species that varies exceedingly both in colour and marking, but none of the varieties approach any hitherto named species.”

In my volume of the *Insecta Britannica* (published in 1854) appears, at p. 126, the additional information “Mr. Douglas bred this species last autumn from larvæ he found at Brighton, in August, feeding on *Salicornia herbacea* and *Chenopodium maritimum*,” and, in the

Entomologist's Annual for 1855, I announced I had bred "*Gelechia instabilella* from larvæ mining the leaves of *Atriplex portulacoides*."

So far, I believe, only one species had really been under consideration, but in the Entomologist's Annual for 1856, p. 52, we are informed that "Mr. Shield bred this insect" [*instabilella*] "from larvæ found early in April, near Dublin, mining the leaves of *Plantago maritima*," and I am now of opinion that this *Plantago*-feeder is a distinct species.

Unfortunately, I seem to have looked upon these specimens from *Plantago maritima* as so essentially representing *instabilella*, that I insensibly modified my idea of that species, and when, in May, 1858, Mr. Thomas Boyd sent me some *Gelechiæ* from Cornwall, of which he had found the larvæ in the flower-heads of *Beta maritima*, I described them as a new species, under the name of *ocellatella*. My impression now is, that these were nothing but *Gelechia instabilella*, as described by Douglas, from specimens on the Essex coast.

The insect, in accordance with its name, varies exceedingly in colour, from ochreous to grey, and varies nearly as much in its markings, the black spots, which are generally present, sometimes disappearing altogether. In the spring of last year I had, through the kindness of Mr. W. H. B. Fletcher, an opportunity of breeding a considerable number of specimens, Mr. Fletcher having found the larvæ in some plenty in Shoreham Harbour, Sussex, mining the leaves of *Atriplex portulacoides*. As late as last November I was consulted by Mr. Harwood, of Colchester, as to some *Gelechiæ* he had bred from *Suæda fruticosa*, and I then referred them to *ocellatella*, and pointed out wherein they differed, as I said, from "the true *instabilella*;" I now hold the opinion that these specimens from *Suæda fruticosa* were themselves the true *instabilella*, of which the name *ocellatella* must now sink as a synonym.

The unfortunate insect, which has for years been my idea of *instabilella*, and which Mr. Threlfall breeds from the roots of *Plantago maritima*, now finds itself nameless! I believe it has not been observed to feed on any other plant. Mr. Shield bred it from the leaves (and I have a figure of Mr. Wing's representing a plant of the *Plantago maritima* with a leaf mined), but Mr. Threlfall assures me that he only breeds it from the root (see Ent. Mo. Mag., xv. p. 89).

"On May 13th, 1877, I collected roots of sea-plantain on the banks of the river Wyre, for larvæ of *Gelechia instabilella*, which mine in the roots, and as far as present observation goes not in the leaf or stem. From these emerged about a dozen imagos of *G. instabilella* in July."

For this now nameless insect I would propose the name of *Gelechia plantaginella*.

Plantaginella is a larger and broader-winged insect than *instabilella*, it generally expands rather over 7 lines, *instabilella* rarely reaches $6\frac{1}{2}$ lines, and some small specimens which Mr. Jenkinson obtained in the Scilly Isles, are considerably under 6 lines. In *plantaginella* the apical nervures of the anterior wings are generally more or less distinctly indicated as grey streaks on the brown ground-colour. The pale sub-apical spots are much more faintly expressed than is often the case in *instabilella*, for I must admit that this latter species is very variable in that respect. Beyond the pale sub-apical spots we generally see in *plantaginella* about 8 black spots round the apex of the wing; even this character is, however, not constant, as I have specimens of *plantaginella* without them, and I have some of the paler specimens of *instabilella* which show them indistinctly. In both species we see occasionally a dark streak from the base down the centre of the wing.

The larva of *plantaginella* should differ essentially from that of *instabilella*, having the head and second segment black, whereas, in the larva of *instabilella*, the head is pale yellowish-brown and the second segment pale greyish-white. Moreover, the larva of *plantaginella* shows no trace of the four dull reddish interrupted lines along the back, which we see in the larva of *instabilella*.

Referring to vol. 2 of the "Manual of British Butterflies and Moths," p. 340, the descriptions of the imago there given of *ocellatella* and *instabilella* both refer to the same species—*ocellatella* representing a more ochreous specimen, and *instabilella* a greyer specimen of *instabilella*; but the two larvæ there described are those of the two distinct species, that described as the larva of *ocellatella* being really the larva of *instabilella* (of which *ocellatella* is merely a synonym), but that described as the larva of *instabilella* is really that of *plantaginella*.

The larva of *instabilella* seems to feed indifferently on any salt-marsh plants of the Natural Order *Chenopodiaceæ*, having been found on *Salicornia herbacea*, *Suaeda fruticosa* and *maritima* (*Chenopodium maritimum*, Sowerby), *Beta maritima* and *Atriplex portulacoides*. Mr. Threlfall mentions (Ent. Mo. Mag., xv, p. 89) having bred this species from larvæ "mining the leaves of *Aster tripolium*." Should this be confirmed, I should suspect the larva to be altogether polyphagous.

Mountsfield, Lewisham :

March 10th, 1883.

SIMULIUM FEEDING UPON CHRYSIDIDS.

BY DR. H. A. HAGEN.

In Colville Valley, Washington Territory, July 24th, I had the chance to observe the destruction of the pine trees (*P. ponderosa*) by the caterpillar of a butterfly (*Pieris menapia*). The details will be published in the Proc. Boston Nat. Hist. Soc. Small flies were very numerous around the chrysalids and caterpillars ready for pupation. These flies were so eager and so little shy, that they could be almost taken with the hands. They proved to be the "black fly" (*Simulium*). There is scarcely any doubt, that they live on the defenceless chrysalis, probably sucking the tail, as I found among the alcoholic specimens some flies still hidden in the dense tail-silk. The fresh chrysalis is rather lively. One on a young shoot of pine made the most convulsive motions, when only a leaf was touched. The end of the tail would be just the spot most difficult to defend against disturbance from an enemy. Perhaps, the curious fact that the numberless chrysalids in the crevices of the pine trees were all hanging down, instead of being erect and kept in this position by a thread around the body, may be the consequence of the constant attacks by these flies. The threads may have been finally broken by constant convulsions. The circumstance that a large number of the chrysalids were dry and dead without containing parasites, speaks in favour of the supposition, that they have been emptied by the constant sucking of *Simulium*. It is generally accepted, that *Simulium* lives only on warm-blooded animals. But it is obvious that these millions of little flies would, in this case, have no chance of food. Large animals shun as much as possible such places where *Simulium* swarms in the day time, and smaller animals are certainly not so common as to be sufficient for their food. If it is accepted that *Simulium* can live on insect-blood—and there is, indeed, no reason to doubt it—at once their existence is easily understood. May this not be the same with mosquito females? The species of *Simulium* seems to be identical with the common New England "black fly," but as this species is still undescribed, a detailed comparison has to be made to decide about the identity. It was, indeed, wonderful, that our whole party of five men and eight horses were not molested at all by the flies on those places, though they were more than annoying in other places where the butterfly was wanting. The seemingly strange assumption that *Simulium* may feed on caterpillars and chrysalids is corroborated by the discovery that *Pulex irritans* feeds upon caterpillars (Entom. xv, p. 70). The stomach fluids of the fleas were

found by Mr. Boden transparent, and not red in colour, as when they have fed upon mankind. Those larvæ which had been attacked by the fleas appeared to pine away and die.

Perhaps, *Acræa Thalia*, in Brazil, and *A. Vesta*, in the Himalaya, are attacked in the same manner as *P. menapia*. Of both I have received very large numbers, collected at Cantagallo and Kooloo. The chrysalids were bundled together, as in *P. menapia*, and also partially dry—perhaps, from the same cause.

Cambridge, Mass.:

February, 1883.

ON SOME AUSTRALIAN *PHYCIDÆ*.

BY E. MEYRICK.

It seems advisable to publish at once the following additional notes to my list of Australian *Phycidæ*, in view of M. Ragonot's forthcoming monograph of the group.

Zophodia ensiferella, Meyr. The ♀ has the fore-wings narrower, paler, and redder than in the ♂, the hind-wings whitish instead of grey, and the abdomen very elongate and curiously depressed posteriorly.

Cateremna leucarma, Meyr. The larva forms true galls on shrubs of *Eucalyptus oleosa*; the galls are long, irregularly cylindrical, apparently formed of a metamorphosed cluster of leaves.

Salebria gypsopa, n. sp.

♂ ♀. 17--21 mm. Head dull white. Palpi whitish, sprinkled on sides with dark fuscous; maxillary tufts of ♂ ochreous. Antennæ grey, annulated with paler. Thorax white, sprinkled with dark fuscous. Abdomen whitish-ochreous. Anterior tibiæ dark fuscous, apex whitish; middle and posterior tibiæ whitish, sprinkled with dark fuscous, with a dark fuscous sub-apical ring; all tarsi dark fuscous, with whitish rings at apex of joints. Fore-wings elongate, narrow, gradually dilated, costa nearly straight, arched towards apex, hind-margin obliquely rounded; white, irregularly clouded with pale ochreous, and irrorated with dark fuscous; first line oblique, slightly curved, double, dark fuscous, enclosing a whitish line, forming a white spot on costa, inner edge broadly dark fuscous, deepest towards costa, outer edge slender, broken or indistinct; an elongate dark fuscous suffusion along middle third of costa; a black dot in disc beyond middle, situated on lower margin of a short, longitudinal, clear, white streak; second line double, dark fuscous, enclosing a whitish line, margins well-defined, faintly dentate, shortly angulated inwards above middle, outwards in middle, and again inwards above inner margin, posterior edge broader and more suffused towards costa; hind-margin suffusedly dotted with dark fuscous; cilia whitish, with four irregular fuscous-grey lines. Hind-wings pale ochreous-grey, with a suffused dark fuscous hind-marginal line; cilia whitish, with a fuscous-grey line near base.

Differs from all the other Australian species of *Salebria* (except, perhaps, *S. digrammella*, Meyr., which I have not been able to examine in this particular), in having vein 3 of the hind-wings rising from the angle of the cell, and not from the stalk of 4 and 5; also distinguished by the white ground-colour, and sharply expressed transverse lines.

Taken very commonly in October near Adelaide, in salt-marshes, amongst *Salicornia australis* and *Cotula coronopifolia*; also at Port Wakefield, South Australia.

TYLOCHARES, *n. g.*

Tongue moderate. Antennæ of ♂ dentate, finely ciliated, with a large tuft of scales in sinuation at base. Maxillary palpi in ♂ long, filiform, with two separate, very long, terminal hair-pencils; in ♀ short, filiform. Labial palpi moderate, curved, ascending, terminal joint short. Fore-wings with 11 veins, 4 and 5 stalked, 7 and 8 stalked. Hind-wings with seven veins, two from close before angle of cell, 3 and 4 stalked, 6 and 7 stalked.

This genus differs from all the rest of the group with basal tuft of the antennæ (except *Dioryctria*, Z., which has 8-veined hind-wings), in having veins 4 and 5 of the fore-wings stalked, and is also remarkable for the double tuft of the maxillary palpi in the ♂, which I do not think has been noticed in any other species. I have formed it for the reception of *cosmiella*, Meyr., hitherto classed with *Euzophora*, in the absence of the ♂, the neururation being very similar; I recently took both sexes in Wirrabara Forest, South Australia.

Heosphora euryzona, *n. sp.*

♂ ♀. 17—22 mm. Head and thorax whitish, mixed with dark fuscous, sides of frontal cone dark fuscous. Antennæ pale grey. Palpi whitish, externally suffused with dark fuscous. Abdomen whitish-grey, basal half rather bright ochreous. Legs dark fuscous. Fore-wings elongate, moderate, slightly dilated, costa moderately arched, hind-margin very obliquely rounded; grey-whitish, irregularly irrorated with dark grey; a straight, clear, white, sub-costal streak from base to costa before apex, leaving costal margin very narrowly dark fuscous-grey, upper edge rather suffused posteriorly, lower edge sharply defined, bordered beneath by a dark fuscous-grey streak suffused into ground colour: cilia pale grey, with rows of whitish points. Hind-wings whitish-grey, somewhat darker towards apex; cilia whitish, with a faint grey line.

Superficially very different from its congeners, and closely resembling *Zophodia neotomella*, Meyr., but easily known by the ochreous band of the abdomen, and, of course, very distinct structurally.

Locally common in Wirrabara Forest, South Australia, frequenting the spinifex grass in October; it is an inactive insect, the ♀ flying slowly and feebly at dusk.

The antennal tuft of the ♂ is very ill-defined, appearing little more than a thickening with rough scales.

Christchurch, New Zealand:

January 15th, 1883.

Entomological collecting during a voyage in the Pacific.—[The following extracts from a letter addressed to the Rev. W. W. Fowler, in continuation of former communications (*vide* E. M. M., xviii, 81, and xix, 22), have been kindly placed at our disposal.—Eds.]—The entire Pacific Squadron, consisting of seven ships, left Callao on February 13th for an evolutionary cruise to the southward. We ran out to lat. 33° S. long. 93° W. before shaping a course for Juan Fernandez. The weather was very fine, with light winds and smooth water, but the absence of animal life, at more than 100 miles from the South American coast, was most remarkable. For weeks together we did not see a living creature in the sea or air, this part of the South Pacific being a veritable ocean desert. After the first week or two the cruise became very monotonous, and every one in the Fleet, I believe, was truly glad to see terra firma again on the morning of March 17th, when we sighted the island of Juan Fernandez. The ships anchored in Cumberland Bay, a small and rather exposed indentation in the north coast of the island, the same afternoon, and remained until the 20th. I do not think I have seen anything to equal the scenery here since leaving the straits of Magellan; the bay being roughly semicircular in shape, walled in by steep and rugged hills, which are densely wooded in their higher portions, even on slopes so steep as to deserve the name of preeipices, where one would think that no tree could find root-hold. These hills culminate in a huge flat-topped mountain, a most striking object from the anchorage, called the "Yunque" or Anvil, from a fancied resemblance which it bears to that article in outline. There is very little level or cultivated ground; near the beach are the remains of a small Spanish Fort, and a few wooden huts occupied by the 50 or 60 inhabitants of the island, who live by fishing, tending cattle, and cutting timber, as well as seal-hunting in the season.

I was able to land two or three times, and ascended the hills some 2000 feet, to "Selkirk's Look-out," a slight dip in the central ridge of the island, where a cast iron tablet is erected to the memory of that famous mariner, and whence a magnificent view is obtained. The vegetation is extremely luxuriant and varied, a sweet-scented myrtle forming a large portion of the undergrowth, and wild peach trees (said to have been introduced by Anson in 1741) are abundant. A few palm trees still linger on the higher and less accessible slopes, but have been nearly exterminated by the settlers, the wood (called here "Chonta") being in great demand at Valparaiso for walking stieks. I met with many familiar English plants, such as wild strawberry, teasle, sheep's sorrel, vervain, wild radish, thistles, docks, &c., and, at elevations greater than 500 feet, the common balm (*Melissa officinalis*) formed a large portion of the herbage. The most noticeable feature of the vegetation, however, is the extraordinary luxuriance and beauty of the ferns, of which I observed more than 20 species, some of them almost deserving the name of tree-ferns. In damp places the "Panke," *Gunnera scabra*, grows very luxuriantly; this is the grandest herbaceous plant I have ever seen; six or eight gigantic leaves, a yard or more in diameter, shaped somewhat like those of the sycamore tree, and with round scabrous footstalks four feet long and as thick as one's wrist, spring from a rough brown horizontal stem eight or ten feet long and as many inches in diameter, the small reddish flowers growing in a loose erect spike about two feet long. The leaf-stalks are eaten by the inhabitants, and somewhat resemble rhubarb; nearly every one of them was bored by a Lepidopterous larva, and by splitting them open I got a number of pupæ, which produced a curious silky-looking, broad-winged, dark brown *Noctua*, whose affinities

I cannot make out, but I think it comes somewhat near *Gortyna*. Two weevils of the family *Cossonidae* occurred in the sinuses bored by the larvæ in the stems, and, by diligently working at stumps and felled trees, I got five or six more species of this interesting family, some in profusion. A very fine weevil, like a *Larinus* in aspect, but allied I think to *Cryptorhynchus*, occurred commonly under loose bark, with a few small "Staphs." &c.; by turning stones I found a few *Geodephaga*, a small *Opatrum*?, and a *Baridius*; and an *Agabus* in standing water. About 20 species of *Coleoptera*, in all, occurred to me, but the *Lepidoptera* were much more poorly represented. The only butterfly I saw was *Pyrameis Carage*, which was not rare, the specimens being rather larger and paler than Chilean examples. About half-a-dozen inconspicuous species of *Phycidae* and *Crambidae* were numerous, as individuals, in open grassy places, and one specimen of the ubiquitous *Stenopteryx hybridalis* occurred. *Plutella cruciferarum* was common among wild radish. The woods swarmed with humming birds, especially a lovely little species (*Eustephanus fernandensis*, I think) which is peculiar to the island, the male being bright chestnut-red, with metallic-red head and green wings, and the female elegantly spotted with green and white. These little fellows were wonderfully tame and familiar, frequently perching within arm's length of me while I was busy working at a stump or log. Fish were very plentiful in Cumberland Bay, and of excellent quality; great quantities were caught with hook and line, and furnished a welcome supply of fresh food, which we all duly appreciated, after living for nearly a month on salt beef and pork.

The weather during our brief stay at Juan Fernandez was fairly fine, but heavy squalls of wind came down from the hills, especially at night, rendering the anchorage somewhat insecure. A large part of the squadron had to put to sea hurriedly on the evening of the 20th, and were joined by the remaining ships next morning. Valparaiso was reached on the 23rd, and the Fleet remained there until April 13th. It was too late in the season for many insects, but I got some nice weevils and small *Heteromera*, as well as not a few obscure looking *Noctuæ*, under stones, and found the handsome and very variable larva of *Deilephila spinifascia* locally abundant on the "Quills" (*Muhlenbeckia injucunda*), a shrubby, wiry polygonaceous plant with small hastate leaves, growing in waste places. A day's visit to the beautiful and fertile valley of Quillota, 23 miles N. E. of Valparaiso, produced one or two butterflies (*Pieris Demodice*, Blanch., &c.), which I had not previously met with.

The Fleet arrived at Coquimbo on April 15th, and remained there till May 1st, when it left again for Caldera. Butterflies were here a little more plentiful than at Valparaiso, the lovely *Pyrameis Terpsichore*, Phil. (closely related to *P. Huntea*), being abundant and in splendid condition. The clouded-yellows, *Colias Fautieri* and *rutilans*, were plentiful and fine, and two or three specimens of the recently-described *C. minuscula*, Butler, a pretty miniature of *Fautieri*, occurred to me. The larvæ of *Papilio Archidamas* were very abundant on the evil-smelling *Aristolochia chilensis*, and a fine *Heptalus*, somewhat like our *velleda* in aspect, occurred not rarely at rest on bushes, &c.

The "Kingfisher" left Caldera on May 6th for the Northern Ports, and, after calling in at Callao for a day or two to coal, &c., arrived at Panamá on May 26th. Twelve days were spent here and at Taboga, during which time I worked hard at the *Lepidoptera*, with fair success, though not nearly so much as I had expected. It was the very end of the dry season, and, for a dozen butterflies which were to be

seen any day, wet or dry, when I was here in October, 1881, there was scarcely one now, with the exception of the "hairstreaks," which were much better represented. Two or three lovely little purple species, barred beneath with black, white, and rust-red, which I had not observed before, were now not rare. A fine *Megalura*, a handsome brown Nymphalid butterfly, with paler transverse bars and great tails to the hind-wings, was occasionally caught on board the ship; and the lovely green and black-tailed butterfly-moth, *Urania Leilus* was frequently seen on the wing towards sunset, flying, however, so high, and at such a tremendous pace, that I could not secure a single specimen. At Taboga, from May 29th to June 3rd, I got several nice fresh *Theclæ* and skippers, the curious long-tailed, angular-winged, fulvous and brown *Marpesia Thetis*, as well as two very fine *Sphinges*; and, by sugaring the trunks of orange-trees in the day-time, I attracted some fine specimens of the handsome *Gynæcia Dirce*, *Prepona Demodice*, and *sp.*, and two or three other *Nymphalidæ*, including the great brown and orange *Aganisthos Orion*, which I failed to secure, to my extreme disgust. Two or three fine *Elaters* and longicorns also visited the bait.

On June 6th, I made an excursion to Emperador, a station on the Isthmus railway, about twelve miles from Panamá, in the midst of a magnificent primeval forest. Although a tremendous thunderstorm came on soon after noon, and put a stop to collecting for the day, I was not unsuccessful, as I observed many insects which I had never seen at Panamá, and added eighteen species of butterflies to my collection, among them some lovely transparent *Ithomias*, &c.

We left Panamá on June 8th, and entered the Gulf of Nicoya on the 11th, anchoring for a day off Puntarenas, the chief Pacific seaport of the republic of Costa Rica. This little town (the cleanest, by the way, which I have seen on this part of the coast) is built on a low sandy spit covered with thorny brushwood, extending about three miles into the Gulf. There is not much forest in the immediate neighbourhood, but I managed to get a good many insects in a short walk on the shore, mostly of species previously met with at Panamá, and including a very fine series of the richly coloured *Colenis Phærusa*, hitherto very rare to me. The roadstead of Puntarenas is notorious for the abundance of sharks, of which we saw a large number, one, in particular, was a monster, its length being estimated at thirty feet at least.

After a pleasant passage of a week's duration, in which we encountered great numbers of turtle, we anchored in the beautiful land-locked harbour of Acapulco, which, being almost surrounded by high forest-clad hills, and cut off from the sea-breeze, was as hot as an oven. The town, which contains about 4000 to 5000 inhabitants, is of poor appearance, though it seems to have seen better days: the aspect of the country is much more tropical than even at Panamá, owing to the large groves of fine cocoanut palms which fringe the beach of the harbour. During our brief stay of four days, the weather (except on the 22nd, when it rained almost without intermission) was fine and sunny, until late in the afternoon, the day usually ending with a heavy thunder-shower; but it was too hot for the active exertion necessary in the chase of tropical butterflies. I managed, however, with the assistance of one or two of my messmates, to obtain a very nice lot of insects, including nearly eighty species of butterflies, forty-two of them being new to my collection.

(To be continued).

Longevity in a beetle.—On the 15th April, 1878, M. René Oberthur sent to me from Rennes a living pair of the well-known *Dytiscus Roeselii*, Fab. ; the insects came by post in a small tin box with some wet moss, and arrived apparently in perfect health ; they had a fresh appearance, and as the larger *Dytiscidæ* are, I believe, all transformed to perfect insects at the end of summer or in the autumn, they had probably, at that time, been perfect insects for about six or eight months ; they may have been older than that, but I do not consider it probable they were. The insects, on their arrival, were placed in a vase of fresh water, and were fed at intervals on pieces of earth worm or tadpoles, and seemed to be quite healthy under this régime. The male died about two years since in the spring, but the female has continued vigorous until recently ; at the commencement of the present month she was noticed to be weak and disinclined for food, and though she took small quantities of nourishment two or three times after this, she did not recover her activity, and on the 9th instant was found dead. Thus this specimen had lived nearly five years with me in this vase of water, and had pretty certainly been a perfect insect for a period of about five and half-years, if not longer. The earlier stages in the metamorphosis of the *Dytiscidæ* are, I believe, all passed through with rapidity, so that the total duration of life of the individual under discussion would be about five and three-quarter years, or less, at any rate, than six years. Sir John Lubbock has, I believe, recorded as great, or even greater, a longevity in the case of some ants, but such a long life has, so far as I am aware, not been previously observed in any beetle. Lacordaire, in his *Introduction à l'Entomologie* (Vol. I, p. 214) when discussing the duration of life of insects, alludes to the fact that Rœsel kept an individual of *Cetonia aurata* alive for nearly three years, and Esper a specimen of *Dytiscus marginalis* for about three and a half years.

Two days after the decease of this specimen, I made a slight examination of its internal organs, in order to ascertain the condition of the ovaries. On opening the hind-body the most remarkable object was the bursa copulatrix, or spermatheca, which was of enormous size, distended and occupying about one-fourth of the area of the hind-body or abdomen. The ovaries were small, and their tubes contained no eggs, but were full of an albuminous substance with darker spots in it, the material I imagined of undeveloped ova. The bursa copulatrix, on being opened, was found to be full of a clear fluid, which, after a moment or two, became very slightly milky, and gave forth an extremely powerful fœtid odour, similar to that which collectors who have captured the larger *Dytiscidæ* must frequently have noticed, as being the result of a discharge of liquid from the extremity of the body. The condition of the ovaries surprised me ; as I have no reason for supposing that eggs have ever been deposited by this individual, I had expected to find the ovaries much more largely developed. According to my experience, it is extremely difficult to obtain oviposition from the larger *Dytiscidæ* in confinement ; Dr. Régimbart has, however, been more successful, and it would appear from his observations (*Ann. Soc. Fr.*, 1875, p. 201) that special conditions are necessary to induce the female to lay her eggs ; it would, indeed, seem, if we may judge from the condition of my specimen of *D. Roeselii*, that even up to the period of the extreme limit of life, and long after fertilisation (for such occurred in the present case) the eggs do not become developed in the ovaries unless the individual be placed in circumstances suitable for their deposition. Such an important physiological induction as this requires, however, more complete

observation and verification ; and at present I only suggest it, for there is more than one way in which I may have been deceived in the present case ; for instance, eggs may have been deposited and not noticed when the water in the vase was changed.

I may add, that during their captivity here, these specimens were carefully fed and tended by Mr. Samuel Hyslop, and that at no period of their existence did they shew any symptoms of the extreme voracity previously recorded in the case of this species, as well as in other *Dytiscidæ*. Indeed, although during a period of ten years I have kept and observed many species of water-beetles, I have never observed any instance of great consumption of food. They are very fond of tadpoles, but do not consume an inordinate quantity of them ; sad to say, they are remorseless cannibals. Perhaps the greatest amount of voracity I can record, is due to a male of *Dytiscus lapponicus*, who in one night completely devoured an immature female of his species, eating even such parts of the wing-cases and skeleton that were not too hard for his jaws to crush.—D. SHARP, Thornhill : February 14th, 1883.

Coleoptera in 1882 in the Hastings district.—Last year was a very peculiar season : many insects that were tolerably plentiful in 1881, were barely represented ; circumstances prevented me from doing much hot-bed collecting, and what I did was chiefly in May. The best things obtained in this way were *Magdalinus barbicornis*, ♀, a single specimen only ; *Monotoma longicollis* and *4-collis* ; a few *Clambus armadillo* and *C. pubescens* ; *Hister bimaculatus* ; *Euplectus sanguineus* and *E. signatus* ; *Microglossa suturalis*.

Guestling sand-pit has yielded very little this past season, the best captures by far were two specimens of *Trichonyx Mærkeli*, found about May 27th. *Zabrus gibbus* and *Plinthus caliginosus* also put in an appearance. I also found *Cænopsis Waltoni*, a good many *Syntomium aneum* and *Syncalypta spinosa*. In a sand-pit at Battle I found a *Philonthus*, with red elytra, which the Rev. H. S. Gorham has kindly determined as a variety of *P. fumigatus*. At the Powder Mill Ponds, Battle, *Donacia semicuprea* swarmed : *D. impressa* and one *D. sagittariæ* occurred.

At Camber, on June 12th, *Crypticus quisquilius* and *Microzoum tibiale* were plentiful. *Saprinus rugifrons*, *metallicus*, and *maritimus* were found, the two former crawling on the bare sand, the latter in carrion ; a single *Sarrotrium clavicorne* appeared, also *Phytosus balticus* under stones beneath high-water mark, and *Aleochara obscurella*.

Glaucium roots, growing at Pett and Bopeep, seem to be very productive ; among a host of things hibernating in the cavity at the crown of the root, were *Ceuthorhynchus verrucatus*, *Corticaria crenulata* and *curta*, both the latter in abundance ; three *Syncalypta hirsuta* I was not sorry to add to my collection from the same source. The most abundant insect, however, was the Hemipteron *Monanthia cardui*.—EDWARD P. COLLETT, St. Leonards-on-Sea : 3rd February, 1883.

Specific distinctness of Cucujus coccinatus and C. Grouvellii.—There seemed to be some doubt on the continent as to the fact of *Cucujus coccinatus*, Lewis, Ent. Mo. Mag., xvii, p. 198, from Japan, being distinct from *Cucujus Grouvellii*, Reitter, from the Himalaya mountains, so last week I sent specimens of the former to M. René Oberthür, who possesses Reitter's type ; and, to-day I received the following memo

from M. Oberthür, written after a careful comparison of two insects side by side :—
 “Les *Cucujus Grouvelli* et *coccinatus* sont deux espèces bien distinctes. Le *C. Grouvelli*, diffère du *coccinatus* par ses élytres mates et non brillantes, sa taille plus grande, sa forme plus allongée, les épines du bord de son prothorax plus nombreuses (ce dernier un peu plus fortement ponctué), sa tête moins large, ses lobes infra-oculaires moins saillants et plus parallèles, ses antennes un peu plus robustes, et la couleur de ses élytres moins vive. Il n’y a aucun doute assurément.”

Cucujus Davidis, Grouvelle, 1881, = *C. imperialis*, Lewis, 1879; and Mon. Aneey’s specimen from Cheefoo, which I noticed before, belongs to this species.—
 GEORGE LEWIS, 39, High Street, Wimbledon: 12th February, 1883.

Reviews.

ANTS AND THEIR WAYS, with Illustrations and an Appendix, giving a complete List of Genera and Species of British Ants. By REV. W. FARREN WHITE, M.A., M.E.S.L. 8vo, pp. 1—279. London: Religious Tract Society.

The above is the title of a very nicely got-up and readable little book, which has recently appeared under the auspices of the Religious Tract Society. It owes its origin, as the author tells us, to a series of papers written by him in “The Leisure Hour” during the year 1880, and the substance of these, together with the additional information collected by him since the time of their publication, are incorporated in the present volume. He gives an interesting general account of the habits and modes of life of our British Ants, glancing also at those of their continental and exotic allies; and to the text are added numerous woodcuts illustrating the peculiarities in structure of many of the more interesting forms, &c. He concludes his book with a chapter on the Termites, or “White Ants,” and adds an Appendix, giving a list and short descriptions of all the species found in Britain, whether introduced accidentally or not. It is a book which we feel sure will be read with pleasure by those who are interested in these instructive little creatures.

The author, besides giving the results of his own long experience, adds to the interest of his narrative by quoting largely from Sir John Lubbock and others; in his remarks on the effect of light upon Ants, he appears to differ slightly from Sir John in his conclusions, he seems to think that Ants are attracted by light and heat, whereas Sir John Lubbock seems to think that they are attracted by heat and darkness. The remarks as to the farm-stock, &c., of the Ants, in Chapter XIII may be thought a little fanciful, and we think we are right in considering *Platyarthus* not only “very like a wood-louse,” but really one.

From a scientific point of view, it is impossible not to take exception to the union of the true Ants and *Mutillidæ* in one “phalanx;” so far as we know, there has not been of late years a single continental authority who has adopted such a view, and it seems to be so completely at variance with the habits and structure of the creatures themselves, that we see no reason for adopting a principle so opposed to the general consensus of opinion.

FIFTH ANNUAL REPORT OF THE DULWICH COLLEGE SCIENCE SOCIETY, 1882.
 Dulwich College: January, 1883.

We are glad to be able to notice the record of the fifth year’s work of the above Society. The report before us shows that the Society has been occupied in most

branches of Science during the year, and in its Entomological portion contains an additional list of captures in the *Coleoptera* and *Hemiptera*, under the superintendence of Messrs. Theod. Wood and H. Bedford Pim. It is only to be regretted that while these families are so assiduously worked, some other members of the Society cannot be found to extend the list in the other less studied regions of the insect world.

CATALOGUE OF BRITISH COLEOPTERA. By Rev. A. MATTHEWS, M.A., and Rev. W. W. FOWLER, M.A. London: West, Newman, & Co. 1883. 48pp. 8vo.

In 1839, Stephens's "Manual of British Coleoptera" was published, and for many years it served as the only professedly complete enumeration of British Beetles, although some local lists did at times appear, the most considerable being Murray's "Catalogue of the Coleoptera of Scotland" (1853). In 1858, Mr. G. R. Waterhouse brought out his "Catalogue of British Coleoptera," a work of great labour and research, which placed us approximately in accord with continental nomenclature, and gave a great stimulus to collecting and determining our native beetles. Rye's Catalogue (1866) carried on the revision and incorporated the numerous additions; and about the same time (there is no date imprinted) appeared Crotch's "Catalogue," differing in some respects from the others, but, except as a collection of names of beetles, was useless to the student, by the omission of the names of the authors of the genera and species. In 1871 was published Sharp's "Catalogue," continuing the revision and additions up to date; but it was marred by the omission of the names of the authors of the genera. All the discoveries from 1855 to 1874 were described or critically noticed year by year in the "Entomologist's Annual," and since the latter year all the additions have been recorded from time to time in the pages of this Magazine, and enumerated in the Index of each yearly volume. In 1882, Mr. Pascoe published his "Student's List of British Coleoptera," of great value for its synoptic tables of Families and Genera, which serve, besides their primary object, to show on what extremely slight grounds a great many so-called genera are founded. All these labours have culminated in the present work, the product of the combined assiduity and research of two well-known and competent Coleopterists, which will tend still more to put us in agreement with the continuous investigations of foreign workers. How necessary this has been is evident on the consideration that Britain has no special fauna, but that, with the exception of some casual immigrants, it consists of species which are the lineal descendants of those which existed here at the time when this portion of Europe became detached from the mainland, and its inhabitants were "*penitus toto divisos orbe Britannos*;" that as regards the insects, nearly without exception, these species still exist on the continent, where they have been described and named, and the names thus given often conflict for priority with those given by British Entomologists, precedence going sometimes to one author sometimes to the other. There is, however, in this Catalogue, confessedly not much deviation from the nomenclature of its recent predecessors; the great difference from them lies in the arrangement. There are four primary divisions in the following order: ALLOMERA containing *Filicornia*, *Clavicornia*, *Lamellicornia*, and *Serricornia*; TETRAMERA containing *Longicornia* and *Monilicornia*; HETEROMERA and RHYNCHOPHORA; with divisions into tribes and families, &c. The scheme is, to a great extent, that of Leconte and Horn; the

reasons for adopting it are given in the preface, and need not be cited here. There is very much to be said for this system as being a superior linear arrangement, although objection will doubtless be taken to the sequence of the great divisions and the position assigned to some forms; yet it will, we think, eventually be approved as a whole, indeed, it is already coming into favour on the continent, or, more strictly, so much of it as has been published, the unpublished part having been specially communicated to the authors of this Catalogue.

The typography is clear, distinct, and remarkably free from errors. All concerned have done their parts well; it remains for the Coleopterists to do theirs.

ENTOMOLOGICAL SOCIETY OF LONDON: 5th February, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

The President appointed Messrs. Stainton, Godman, and McLachlan, Vice-Presidents for the year.

The following were elected, viz., A. C. Horner, Esq., of Tunbridge; P. Crowley, Esq., of Croydon; and Capt. G. E. Shelley, of Tenterden Street.

Mr. Billups exhibited an exotic Orthopterous insect of the family *Locustidæ*, found living in a hothouse at Lee; it was strongly carnivorous in its habits.

Mr. Pascoe called attention to a letter from the Duke of Argyll that had recently appeared in "Nature," respecting the mimetic resemblance of a moth (species not given) as observed by him in the Riviera; some discussion ensued, but no Member appeared able to identify the moth from the vague description given.

Mr. Perringey communicated notes on the habits of several South African species of *Paussus*, and especially in connection with their powers of crepitating, and carnivorous propensities.

7th March, 1883.—The President in the Chair.

The following were elected, viz., F. W. Smith, Esq., of Blackheath; F. F. Freeman, Esq., of Plymouth; and F. C. Lemann, Esq., of Plymouth.

Mr. McLachlan exhibited an example of *Polistes hebraus*, an Indian and Chinese wasp, found living a few days previously on board a ship in London that had recently arrived from Calcutta. It was apparently dead at the time of exhibition, but revived with the heat of the room. He thought it had possibly been bred from a nest inside bamboo.

Dr. Sharp exhibited a dissection of the prosternum of an *Elatér*, and called attention to the peculiar condition of the prothoracic stigma, which was closed by a perfect trap door. He thought this arrangement might be useful in excluding parasites when the beetle was on its back, after the manner of its kind.

Mr. Billups stated that the Orthopterous insect exhibited at the previous meeting proved to be a species of *Copiophora*, and its native country was probably Central America. He also exhibited two species of *Ichneumonidæ* taken at Chobham, new to this country, viz., *Hemiteles fasciatus* and *Phæocerus homochlorus*.

Mr. G. S. Saunders sent for exhibition an apparatus he had invented for the better examination of minute insects and dissections under the microscope. It consisted of an adaptation of the "universal hinge" let into a slip of wood, and furnished with an adjusting screw.

Mr. Bridgman communicated further additions to the List of British *Ichneumonidæ*.

ON THE SYNONYMY OF CERTAIN MICRO-LEPIDOPTERA.

BY E. MEYRICK.

Observing that Mr. A. G. Butler, of the British Museum (see *ante*, pp. 106—108), has endeavoured to identify some of the Australian *Micro-Lepidoptera* described by Zeller with Walker's species, I think it desirable to point out some instances in which I am disposed to arrive at different conclusions.

Ecophora dichroella, Z., is identical, as stated, with the species described by Walker as *Æc. divisella* on p. 685 of the catalogue, but as Walker had already described another *Æc. divisella*, on p. 677, the second one must be considered cancelled, and Zeller's name will be retained. The species is referable to *Cæsyra*.

Æc. irruptella, Z., is a species of *Philobota*, and widely remote from *irruptella*, Walk.; but it is singular that either Prof. Zeller or Mr. Butler should think it necessary to account for Walker's having widely separated allied species. *Æc. irruptella*, Walk., belongs to the *Tineidæ*, and has no relationship whatever with *Cæsyra dichroella*, Z. (*Æc. divisella*, Walk.), as stated.

Æc. trijugella, Z., is not identical with *Æc. bractearella*, Walk.; they are allied, but perfectly distinct, species of *Philobota*.

Æc. griseicostella, Z., is correctly identified with *Æc. productella*, Walk.; it is a species of *Philobota*.

These are the only Australian species alluded to by Mr. Butler.

With regard to the generic identifications. Walker's genera *Vazugada* and *Tortyra* must be wholly rejected, the diagnoses being perfectly worthless; genera are abstractions, and cannot be determined from types. Zeller's generic names will, therefore, stand.

Whilst on this subject, I may as well correct the synonymy of two or three species of Australian *Micro-Lepidoptera* described by Mr. Butler in the *Annals and Magazine of Natural History* for 1882, pp. 96—102.

Rhodaria robina, Butl. (p. 96), is a synonym of *Endotricha pyrosalis*, Gn.; *Endotricha ignealis*, Gn., *Pyralis stilbealis*, Walk., and *Pyralis docilisalis*, Walk., are also synonyms of the same species: Walker's descriptions being taken from females. The species is a true *Endotricha*, and has, therefore, no affinity with *Rhodaria*, Gn., which is not separable from *Botys*.

Thinasotia (Crambus) impletella, Walk., is quite erroneously stated (p. 98) to be identical with *T. pleniferella*, Walk.

Conchylis Thetis, Butl. (p. 98), is a synonym of *Dichelia isoscelana*,

Meyr.; the species has, of course, no possible connection with *Conchylis*. The insect alluded to as a new *Penthina* (p. 99) is the female of the above species.

Conchylis ? *auriceps*, Butl. (see note, p. 99), has no affinity whatever with the *Tortricina*, being, in fact, a species of *Philobota* (*Ecophoridae*) closely allied to *P. Arabella*, Newm., from which it seems to me that Mr. Butler is mistaken in asserting that it differs in neuration and other respects. The locality is given as "between Sydney and Moreton Bay," places 500 miles apart.

Christchurch, New Zealand :
January 4th, 1883.

ON THE BRITISH SPECIES OF *EREMOCORIS*.

BY J. W. DOUGLAS.

In the "British Hemiptera" (1865), under *Eremocoris erraticus* (1) is described, at p. 178, a form (2) which had been deemed to be distinct, but both forms having been submitted to Dr. Fieber were returned as *E. erraticus*, Fab., No. 2 with the remark "*Eremocoris erraticus*, Fab.: ist vollkommen gezeichnet und hiernach die europ. Hemipt. zu berichten." The two forms thus became to us but varied representatives of one species; but when I said (Ent. Mo. Mag., xi, 265, [1875]) that the Fabrician type specimen of *Lygæus podagricus* agreed with our *E. erraticus* it was the form No. 2 that I had specially in view: this identity has been since corroborated by Mr. Edward Saunders. Recently I sent to Dr. Horváth an example of No. 1 and 2, the same in fact that had been to Fieber, and No. 2 comes back as *L. podagricus*, Fab., this conclusion verifying that derived from my examination of the original, of which Fabricius says "*Femora antica bidentata atra, pedes reliqui picei*;" the original idea of Douglas and Scott that it was a distinct species being also corroborated. Until I identified it as above stated, *podagricus* had been referred to as a synonym of various species, but in 1874 it was acknowledged as distinct by Populus who described it under the name *icaunensis*.

Our *E. erraticus* (No. 1) is pronounced by Dr. Horváth not to be the Fabrician species of that name, but *Pachymerus fenestratus*, H.-Schf., Wanz., iv, 95, T. 140, fig. 437, a species very similar but distinct, the special characteristics being that all the thighs are black and the first pair have *two* prominent teeth on the under-side. Herrich-Schäffer only says "Schienen und Tarsen rostroth," but the figure has *all* the thighs black. The species has been placed, by those authors who have referred to it, as a synonym of *E. erraticus*.

Assuming this differentiation to be correct, and I am disposed to concur, it would, so far, seem that *E. erraticus*, Fab., was not an inhabitant of Britain; but in the Ent. Mo. Mag., viii, 98 (1871), Dr. F. Buchanan White recorded the capture of an *Eremocoris* living in April in small companies below stones on the bare and treeless summit of Mòr Shròn in Aberdeenshire, far from juniper or fir-trees; this he and I deemed to be *E. erraticus*, and a recent examination of the specimens shows that they are the true species, having the Fabrician characters of legs entirely rufo-testaceous and the anterior thighs with only one prominent tooth beneath. This species appears to be generally distributed in Europe. Dr. Horváth has sent a Hungarian example.

Our *E. plebeius* Dr. Horváth says is correct.

The British species may be thus enumerated:—

1. *erraticus*, Fab., et auct.

2. *fenestratus*, H.-Schf., Horv.

E. erraticus, partim, D. & S., Brit. Hem. (syn. excl.).

3. *podagricus*, Fab., Doug. (syn. excl.), Horv., E. Saund. (syn. excl.).

E. erraticus, partim, D. & S., Brit. Hem. (syn. excl.).

4. *plebeius*, Fall., Horv.

Dr. Horváth wrote to me that his article on *Eremocoris* would appear in the "Revue d'Entomologie de M. Fauvel:" this I have not seen, but the foregoing rectification is in accordance with his conclusions as intimated in his letter.

8, Beaufort Gardens, Lewisham :
31st March, 1883.

THE BRITISH SPECIES OF THE GENUS *PSITHYRUS*, LEP.,
= *APATHUS*, NEWM.

BY EDWARD SAUNDERS, F.L.S.

Dr. Schmiedeknecht has just published in "Apidæ Europææ," fasc. v and vi, a Monograph of the European species of *Psithyrus*, in which he describes eight species; of these we appear to have five in this country, although hitherto we have only known four. These five are *rupestris*, *vestalis*, *campestris*, *Barbutellus*, and *quadricolor*, the last of these being identical with *Barbutellus*, Smith, *nec* Kirby. How F. Smith came to apply Kirby's *Barbutellus* to *quadricolor* I cannot imagine, as Kirby's description certainly will not agree with it, and in his collection the males of the two species are mixed, and both females are *Barbutellus*, Schmied. Kirby's description of the abdomen of the ♂, "Abdomen triangulare sub-acuminatum, segmento

primo villorum flavidorum, penicillo utrinque ornato. Anus albus, extremitate nigro-villosus haud inflexus," cannot possibly apply to *quadricolor*, which has the abdomen sub-globose and its extreme apex fulvous-red. F. Smith seems to have realized this, saying, in his 1st edition of the Catalogue of the Bees of Great Britain, under *Apathus Barbutellus*, "I suspect a difficulty has arisen in the discrimination of this species, in consequence of Kirby using the terms, 'abdomen sub-triangular' and 'anus albus;' the latter is fulvous, which in worn examples becomes white. I have used the term sub-globose in describing the abdomen of the ♂, and although strictly it is sub-triangular, still, in contradistinction to the male of *campestris*, it is sub-globose, and will serve as a distinction between them."

Now, in Kirby's collection there are two males, one which agrees in every particular with Kirby's description, having the abdomen shaped as in *campestris*, and which is certainly referable to the *Barbutellus* of Schenck and Schmiedeknecht; the other a specimen, I believe of *quadricolor*, but with the extreme apex of the abdomen wanting: under these circumstances, I can see no excuse for not accepting the specimen, which alone suits the description, as the type, and I have therefore followed the nomenclature adopted by Schenck and Schmiedeknecht. The five species may be easily distinguished thus:

- (2) 1. Fourth and following segments of the abdomen red in both sexes .. *rupestris*.
- (1) 2. Fourth and following segments either white or yellow, or of various colours, but not all red.
- (4) 3. ♂ with the abdomen sub-globose, the extreme apex fulvous, ♀ with the extreme apex of the abdomen beneath armed with a pointed process... *quadricolor*.
- (3) 4. ♂ with the extreme apex of the abdomen black, ♀ with the apex simple.
- (6) 5. Both sexes with the posterior metatarsi almost as wide as the tibiæ, and generally with a line of yellow pubescence dividing the black of the base of the abdomen from the white of the apex. ♂ with the sagittæ of the genitalia not toothed beneath *vestalis*.
- (5) 6. Posterior metatarsi much narrower than tibiæ, no yellow line of pubescence between the black and white. ♂, sagittæ toothed beneath.
- (8) 7. Apical segments of ♂ black or yellow, not white, 6th segment beneath simple, genitalia with the squamæ widely triangular, ♀ with the apex of the abdomen yellow at the sides, 6th segment shining at the base .. *campestris*.
- (7) 8. Apical segments of the ♂ white, 6th segment beneath with a slight callosity on each side, genitalia with the squamæ narrowly triangular, ♀ with the apex white, the 6th segment rugosely punctured..... *Barbutellus*.

The species now called *Barbutellus* is apparently common, only it has been overlooked. Sir Sidney Saunders has had the males separated for some time in his collection by the genitalia.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(continued from p. 250.)

PTINIDÆ.

Ptinus testaceus, Ol.

Allied to *P. fur*, but readily distinguished by the fact that it has no tufts of white hair in the middle of the back of the thorax: Dr. Sharp records this species (Ent. Mo. Mag., ix, 268), but says that he did not capture it himself, and can give no clue to its locality: it seems to require further evidence before being admitted into the British list.

HETEROMERA.

Tribolium confusum, Duval.

This species is rather longer, broader, and flatter than *T. ferrugineum*, F., and has the thorax more rounded at the sides in front; its antennæ are gradually dilated towards the apex, instead of having the last three joints decidedly broader than the preceding joints (Ent. Mo. Mag., ix, 268).

Latheticus oryzæ, Wat.

This insect is very much of the shape of a *Tribolium*, but may at once be distinguished by its very curious antennæ; it is, however, so evidently an importation, that it requires no further notice; the same, perhaps, might with reason be said of the preceding species, but it is exceedingly hard to draw a hard and fast line in these cases.

Abdera triguttata, Gyll.

This insect is a little like *A. bifasciata*, Marsh., but is larger and much broader (especially behind) in proportion, with the markings of the elytra very different: it is very pubescent, and rather coarsely punctured all over, and has the two basal joints of the antennæ testaceous. It was first found by Mr. Champion under bark of young dead standing Scotch firs at Aviemore, in June, 1874 (Ent. Mo. Mag., xi, 63).

Serropalpus striatus, Hellen.

This is an insect that is very doubtful as British; Mr. Blundell, of Luton, has a specimen that he took near Luton, and he writes to me that he feels sure that it was taken by him out of doors, but that he cannot remember the locality, as he was only just beginning to collect *Coleoptera* at the time; he did not know the insect until Mr. Waterhouse named it for him.

Zilora ferruginea, Payk.

The genus *Zilora*, which is new to the British list, is closely allied to *Dircæa*,

from which it differs in its coarser punctuation, in the third joint of its antennæ being shorter and narrower than the fourth, in its smaller and narrower thorax, and shorter tarsi. Found at Braemar by Dr. Sharp and Dr. Buchanan White, and by Mr. Clampion at Aviemore (Ent. Mo. Mag., viii, 74; xi, 63).

ANTHICUS SCOTICUS, Rye.

This is the *Anthicus* originally named by Du Val as *A. flavipes*, Panz.; the much finer punctuation of *A. flavipes*, however, is sufficient to separate it from this insect, although it is closely allied to it. Mr. Rye has, therefore, made it a new species. It comes nearest to *A. angustatus*, Curt., of our recorded species, but differs from it in its shorter and stouter antennæ, larger size, broader build, darker limbs, broader and shorter thorax, and much broader elytra. It is the *Anthicus* 6, sp. nov., of Waterhouse's catalogue. Found by Dr. Syme and Mr. E. A. Waterhouse in some numbers on the banks of Loch Leven (Ent. Mo. Mag., ix, 10).

Meloë cyaneus, Muls.

This is probably only a variety of *M. proscarabæus*, L. Mr. Rye referred several specimens of *Meloë* taken in the Isle of Man and near Barnstaple to Mulsant's insect, but came to the conclusion that the latter is itself only a variety (Ent. Mo. Mag., viii, 248, 288).

ANASPIS VARIEGATA, Power.

This insect, of which Dr. Power possesses a long series taken in the south of England, comes near *A. frontalis*, L., but may easily be separated from that insect by the light colour of its legs, and its more shining appearance.

ANASPIS MONILICORNIS, Muls.

Mr. Crotch includes this insect in his catalogue with a query, stating that it has the colouring of *A. rufilabris*, but with no ventral appendages in the male, and the first joint of the anterior tarsi equal to the second, whilst in *rufilabris* it is much shorter. Dr. Power possesses a specimen in his collection, and, on his authority, we have again introduced it.

(To be continued).

A correction.—On the last page of the April number of this magazine, in the report of the proceedings of the Entomological Society, Mr. Billups is reported to have exhibited two ichneumons, viz.: *Hemiteles fasciatus* and *Phæocerus homochlorus*; the first of these names was only MS., and has been altered to *incisus*, at present also MS.; the other species should have been *Phæogenes homochlorus*, Wesm.—JOHN B. BRIDGMAN, Norwich: April 11th, 1883.

[We are much obliged for this correction. We think it is generally known that our reports of the proceedings of the society are *not official*.—EDS.]

NATURAL HISTORY OF *PETASIA NUBECULOSA*.

BY WILLIAM BUCKLER.

On 6th of May, 1881, I received from Mr. H. McArthur while he was collecting at Rannoch, a dozen eggs of this species, laid loose, and on small morsels of bark; of these, two proved infertile; the first egg hatched on May 16th, being one I had previously sent to the Rev. J. Hellins; with me two were seen to be hatched in early morning of the 17th, two at midnight, three by next morning, one near midnight following, and the last one by morning of the 19th.

All my young larvæ took to birch readily, but the one Mr. Hellins had chose oak, and fed on it until its third moult, and from that time, the 4th of June, it would eat birch, and not oak; after feeding their growth was very perceptible, and when six days old they each in turn lay up for moulting; this operation occurred five times in all before their full growth was attained; generally they agreed very well together,—though two individuals during the earlier stages while helplessly laid up waiting to moult appeared to have been inconveniently in the way of some of the others, and so got fatally bitten behind; afterwards, with more space, they proved to be very contented and well behaved.

They became full-fed from June 26th to 29th, and retired to earth; over the earth, at the end of June, I placed a thick covering of moss, and found afterwards that only two had elected to remain below in the earth, and that the other five were lying in the pupa state on its surface beneath the moss; the larva, with Mr. Hellins, had buried itself four or five inches deep in the loose leaf-mould furnished for its retreat.

I bred three male moths and one female in March, 1882; the single pupa of Mr. Hellins stood over until the present season, and disclosed a fine male imago on 15th of February; my remaining pupæ produced fine male and female specimens on the 1st of this month of April.

It has been pointed out before that the egg of *nubeculosa* (as well as those of *P. cassinea* and *D. cæruleocephala*) does not follow the *Notodonta* so much as the *Noctua* type,—being circular, and convex above, with a largish central space covered with irregular reticulation, and on the sides from forty to forty-five blunt ribs, with somewhat coarse transverse lines, in height about $\frac{1}{8}$ ", in width about $\frac{1}{4}$ "; the shell rather glistening, the colour at first dirty drab-green, but soon becoming closely and tortuously streaked and blotched with blackish-green; a few hours before hatching these marks become indistinct and clouded, and the shell looks somewhat shrivelled.

The newly-hatched larva is about $\frac{1}{16}$ " in length, with the first and second pairs of ventral legs less developed than the third and fourth pairs, so that the walk is semi-looping; the head of a rather light shining orange-brown colour; the back slaty-grey, the sides pale drab, the black warts very large and round, each furnished with a small black bristle; in this stage the likeness to *cæruleocephala* is marked, but at each moult the warts become proportionately smaller and less conspicuous, besides assuming another colour, and so this resemblance disappears: from the first the young larva eats small holes quite through the leaves of its food, and I noticed its habit of spinning a few threads for a foothold.

After the first moult, a slight protuberance appears on the twelfth segment and front portion of the thirteenth, the ground colour is pale greenish, bearing dorsal and sub-dorsal lines of paler dots, and on the middle segments a wide sort of incomplete **v** in very fine black lines; the black tubercular dots were much smaller than before and only to be seen with a lens, but their bristles had become longer, the anterior legs were black, and on the outside of each ventral leg was a black spot.

After the second moult, the head was pale shining green, the body light dull green having a purplish tinge in it, the tubercular dots pale yellowish, the dorsal markings composed of elongate whitish-yellow dots two on a segment, and along the sub-dorsal region were four yellowish dots on each segment, a slanting streak of the same colour appeared on the side of the fourth, and a transverse streak on the ridge of the twelfth, and a black spot on each ventral leg as before.

Having moulted the third time, June 3rd—5th, the larvæ began to assume their well-known star-gazing posture, with all the front part of the body extended upward in a curve bringing the head so far back as to be elevated just over the eleventh segment, while the anterior legs were freely outspread, the third pair wider apart than the others; all the details of colour being similar to those of the previous stage.

The fourth moult happened on 9th—10th of June, and they soon resumed feeding, eating large pieces out of the leaves at intervals, and at other times were to be seen for long periods hanging to the birch sprays motionless in their singular attitude of repose, but yet so suggestive of great muscular exertion and watchfulness; their growth now seemed rapid, as in course of three days they were observed, when in motion, to be an inch and three lines long, stout, and thickest behind, their colouring of the same light green as before, the upper surface bearing rather warty spots of bright yellow, and, of the same yellow, slash-like streaks on the thoracic and posterior segments; the anterior

legs black, ringed with ochreous at the joints; some individuals still bore the large roundish black spot above the foot of each ventral leg, while others had only a black outline of it, or part of it.

The fifth moult occurred on 15th—19th of June, and for a time after this operation the head was of rougher texture than heretofore, but gradually, in three or four days, regained its glossiness; the larva now did not so often assume its posture of contemplative repose, but seemed more intent on its consumption of food, and in the shorter intervals of rest was to be seen lying quite at full length, or in a gentle curve, along the birch twigs quite fat and lethargic, until almost full fed, but when this stage was reached, it again was frequently to be seen in its more characteristic position; when quite full grown the larva was of the length of 2 inches, and of thickness in proportion, with a very soft skin; the head full and rounded, with lobes lightly defined; the body cylindrical with plump segments deeply divided as far as the twelfth, and there tumid and humped with a slight dorsal ridge, thence sloping and tapering a little on the very long front part of the thirteenth and still more on the short anal flap, deep wrinkles sub-dividing only the thoracic third and fourth segments; the anterior legs rather small but set on large pectoral muscular foundations; the ventral and anal legs stout with well developed feet and hooks to secure prehension and progression: the colour of the head is now pale bluish-green, the upper lip whitish or else pale yellow, the mouth black; the back of a delicate pale yellowish-green becomes paler and opaque from the thoracic segments to the twelfth, blending gradually into a deeper brilliant yellowish transparent green on the sides and belly; the slightly raised spots are all of pale primrose-yellow, the dorsal series are elongate-oval in shape, two on each segment one beyond the other in a broken line on the fifth to the eleventh inclusive; the other series of spots are of round shape, such are the trapezoidally arranged fours of the back, the sub-dorsal broken line of threes, the lateral single spot, and the spiracular line of fours and the single spot below each spiracle, which itself is white, tenderly outlined with black; a transverse series of four spots show faintly on the fourth segment, a small tumid side streak of the same yellow is on the third, and another conspicuously larger and longer is on the fourth slanting down obliquely forward; on the back of the twelfth are two spots, and behind them on the summit two much larger spots united to a tumid curved streak of yellow; a conspicuous tumid side streak of similar yellow begins behind the spiracle and tapers off on the margin of the anal flap; the anterior legs are bright red, and outside each ventral leg is a roundish ring of black, the feet being furnished with brown hooks.

The pupa is a full inch in length, by four and a half lines in width at the thickest part across the ends of the short wing covers, the antenna-cases well developed; the head and thorax smooth, the wing covers most minutely roughened, also the upper portions of the abdominal rings, the free segments of the abdomen are very deeply cut and gradually taper towards the end, but with dissimilar outline on the ventral and dorsal surfaces; the ventral becoming bluntly rounded, and the dorsal rising somewhat in a hump from which springs the base of a prolonged stout spike, whose blunt extremity is furnished with two fine tapering points bent downwards and curved like claws; the colour is a deep and dingy red during the first year, and in the second becomes a blackish-brown, bearing a slight purplish gloss.

Emsworth: *April 9th, 1883.*

Entomological collecting during a voyage to the Pacific (concluded). The genus *Papilio* was represented by twelve species, the commonest being *P. Philenor*, a handsome black "swallow-tail," glossed with rich bronze-green, and with a curved row of large, round, bright orange spots on the hind-wings beneath. Two or three very showy red-spotted black species were also fairly plentiful in the lanes, and two or three very beautiful and delicate-looking semitransparent species with very long tails (related to the South American *P. Protesilaus*, &c.) also occurred, but were very hard to obtain in perfect condition. The large and handsome *Gonepteryx Clorinde* occurred sparingly, as did the beautiful sulphur and black *Colias Cæsonia*; and seven or eight species of *Terias*, including some fine orange-coloured ones, abounded in all the more open places. Settling on tree-trunks, I found three species of *Ageronia*, *Smyrna*, sp., and two of *Siderone*, the latter, however, being represented by single worn specimens. *Marpesia Thetis* was often seen, but persisted in keeping well up out of reach of a long-handled net; *Eresia*, *Euptoieta*, *Melitæa*?, and *Phyciodes* were well represented in grassy openings and cocoa-nut groves; and by road-sides I took several specimens of the singular *Libythea Carinenta*, with its excessively long palpi. A lovely specimen of *Biblis*, quite distinct from the one found at Panamá, occurred singly at a thicket, and several fine *Erycinidæ*, *Theclæ*, and skippers, some of the latter being very large and handsome, complete my list of captures. I noticed comparatively few moths, though there were some pretty little day-flying *Bombyces* among them. Beetles were fairly numerous, though mostly small; but I got some nice *Lycidæ* and *Cassidæ*, one or two *Cetoniæ*, and other interesting species.

Leaving Acapulco on June 23rd, we anchored off the miserable little port of San Blas on the evening of the 26th. The town, which is notoriously unhealthy, is built on about the worst site it is possible to imagine—a flat strip of sand only four or five feet above high-water mark, shutting off the inner harbour, a mere shallow lagoon, from the sea, and with pools of foul-smelling stagnant water in many places among the houses. We stayed at this delightful spot only twenty-four hours, but I was able to get a short walk on shore for about two hours in the early morning

of the 27th, which I spent for the most part in fighting mosquitoes and sand-flies. These blood-thirsty wretches swarmed to an extent which I could scarcely have believed possible, rising up off the bushes like thin clouds of smoke, as I walked along the paths in the thickets outside the town. It was not very easy to devote any attention to other insects, but I noticed a good many of the Acapulco butterflies, and was especially pleased to come across the huge satiny-white *Morpho Polyphemus*, of which I secured a splendid pair. This beautiful creature flies with a slow, undulating motion over the tops of the tall brushwood, and has a noble appearance on the wing: but the horribly tangled and thorny nature of the places it frequents, renders it anything but an easy prey. *Deilephila Daucus*, *Gonepteryx Clorinde*, and other useful things, were taken on board the ship.

We passed Cape St. Lucas on the evening of the 29th, immediately experiencing a fall of 20° in the temperature of the sea and air—a most welcome change after the excessive heat of Acapulco and San Blas. The appearance of the coast of Lower California was not less different, as it was as barren and desolate as the worst part of the Peruvian seaboard, being a waste of naked rocks and yellow sand-hills, without a scrap of vegetation of any sort, and rising, in the background, into rugged mountains, 4000 or 5000 feet high. The wind was in our teeth all the way, compelling us to use steam, and on the night of the 8th July, we had to put into San Francisco to replenish our coal. We stayed here only two days, during which time, being very busy, I was able to see but very little of this great city. Leaving again on the 11th, and encountering a strong and northerly gale during the greater part of the following week, we were all very glad to find ourselves safely anchored in the beautiful little harbour of Esquimalt, in Vancouver Island, by midnight on the 18th.

As the "Kingfisher" remained at this port for more than three months, I had a good opportunity of investigating the local insect-fauna; and, although I was too late for some of the best things, my success was, on the whole, very satisfactory. I was fortunate enough to meet with a brother collector, Mr. W. Taylor, of Derby, and together we worked hard at the *Coleoptera* and *Lepidoptera*. The country for six or eight miles round Victoria (the capital of British Columbia, about three miles distant from Esquimalt), is exceedingly pretty and varied, being covered with fine timber down to the sea-shore, alternating with wide stretches of open meadow and corn-land, dotted with large oak-trees, and gradually merging into the dense forest which clothes nearly the whole of Vancouver Island. The trees are for the most part the Douglas Fir (*Abies Douglassi*), which attains very large dimensions, and yields valuable timber: with a sprinkle of maple, alder, willow, aspen, cedar, arbutus, &c.: the undergrowth consists of two or three species of wild-rose, brambles, snow-berry (*Symphoricarpos racemosus*), and "Sallal" (*Gaultheria shallon*), an evergreen rather like our bilberry, and producing an edible fruit: wild cherries, raspberries, and gooseberries also abound. The woods are intersected in all directions by narrow paths or "trails," in which it is by no means difficult to lose oneself, as I found more than once to my cost. About five miles from Esquimalt is a series of lakes abounding in trout, and surrounded by wide marshy borders, where many good insects occur.

We enjoyed exceedingly fine weather up to the middle of October, when it became cold and rainy: the nights were unusually still, cool, and cloudless, and to this circumstance I attribute the entire failure of sugar, which I tried on a good many evenings without attracting half-a-dozen moths in all.

Although butterflies were exceedingly numerous up to the middle of September, I noticed only about twenty species, among which I may mention *Papilio Turnus*, L., of which the larvæ occurred sparingly on willows and sallows; and *P. Oregonia*?, which was occasionally seen in the marshes, where the larva was to be found in some small numbers feeding on a species of *Sium*. This beautiful insect bears a very close resemblance, in all its stages, to our familiar *P. Machaon*. A very handsome and delicate *Pieris* (? *P. Menapia*), almost like a *Leucophasia* in structure and flight, appeared in great numbers about the middle of August, the ♂ flying in hundreds round the tops of the pines, and also frequenting wayside flowers, the ♀ being comparatively very scarce. The *Satyridæ* were poorly represented by a little *Cænonympha*, almost exactly like a small *C. Pamphilus*, which was common in grassy places. *Limenitis Lorquini* well replaced our "White Admiral," which it closely resembles, except that the fore-wings are tipped with ferruginous, and it is much redder beneath; it was very common, and an exceedingly pretty object, sailing gracefully along the sunny "trails" and roads, and settling, by preference, on the brake-fern (*Pteris aquilina*). Unfortunately, I was too late to get it in really fine order. *Pyrameis cardui*, not to be distinguished from British specimens, turned up sparingly, and *Vanessa Antiopa* was common enough, the chrysalis being often found attached to walls, &c., even in the town of Victoria, but it was generally ichneumonized. The specimens of this insect are rather smaller and darker than average British or European ones, the pale border being of quite a rich yellow tint. *Vanessa Milberti*, like a very dark *V. urticae*, was to be found in weedy places and by roadsides, with two, or, perhaps, three species of *Grapta*, nearly related to our *C-album*, and differing chiefly in the shape of the white letter-like mark in the hind-wings beneath. The larvæ were to be found feeding on nettles, hop, &c., and the pupæ attached to walls and fences. Three species of *Argynnis* occurred, one of which, *A. Calippe* (very like *Aglais*), was almost the commonest fly of the district; another fine species (? *A. Atlantis*), of about the same size, but much darker above and beneath, with the silvery spots of the hind-wings replaced by yellowish-white, was more local, but not rare, and the pretty little *A. Freya* (I fancy it is the same as the North European species) occurred to me only singly, but it is a common spring insect. A small dark *Thecla*, near *pruni*, &c., was somewhat scarce, and a very beautiful *Chrysophanus* (the ♀ bright red, spotted and bordered with black, the ♂ suffused with rich violet-purple) was very abundant, frequenting hawk-weed and camomile flowers by the road-sides. Two species of *Pamphila*, bearing considerable resemblance to *P. sylvanus* and *comma* respectively, were also to be found in the same situations.

The only true *Sphinx* I met with was a *Smerinthus*, closely related to *ocellatus*, which occurred rarely in the larva state on willow. A very fine red-belted *Sesia* was once taken at rest: two very handsome *Saturnia* larvæ were also to be obtained very sparingly on oak bushes and "woolly bears" of several kinds were met with everywhere in the autumn, but *Bombyces* were decidedly scarce in the perfect state. The *Noctuæ*, in spite of the failure of sugar (at which the only thing taken that was worth pinning was a fine *Catocala*, near *sponsa*), were fairly well represented, many pretty species being taken by my friend, Mr. Taylor, at light. The *Geometræ* were more plentiful, some species, indeed, occurring in extreme profusion, notably, a handsome brown and ochreous *Ennomid*? moth, the larvæ of which (locally known as "span-worms"), in July, completely stripped the oaks in many places, and then

perished in many places for want of food; and, in September, the trunks of the trees were covered with the moths closely packed together, and a stone, thrown up so as to strike a branch, brought them out in absolute clouds. Several fine "yellow thorns" were to be found by searching after dark with a lantern, and by beating the pines, &c., many pretty "Carpets," with a considerable number of *Tortrices* and *Tineæ*, but comparatively few *Pyrales*, *Crambites*, and *Pterophori* occurred; the little *Alucita polydactyla* was very common in the autumn. A considerable number of the local moths were either absolutely identical with, or very closely related to, well-known British species: among others, I may mention, *Orgyia antiqua*, *Miana strigilis*, *Apamea oculatea*, *Xanthia silago*, *Gonoptera libatrix*, *Plusia gamma*, *Metrocampa margaritata*, *Macaria alternata*, *Melanippe subtristata*, *Scotosia dubitata*, *Eucosmia undulata*, *Coremia ferrugaria*, *Cidaria prunata*, and *immanata*, &c.

The season was too far advanced for most of the *Coleoptera*, but I found a good many interesting species, chiefly by tearing the loose bark off felled trees and pine stumps, sweeping being of very little use. Some fine *Elaters* occurred, notably *Alaus luscus*, F., a very handsome species, an inch and a half long, brown, with two large, white-ringed, black eyes on the thorax. Among the Longicorns, I may mention, *Prionus pocularis*?, not unlike our British species, and another grand *Prionid* reminding me of the S. European *Rhesus serricollis*. Two or three good-sized and very handsome green and coppery species of *Ancylochira* represented the *Buprestidæ*; *Cucujus puniceus*, a conspicuous blood-red and exceedingly flattened beetle, turned up under oak bark, where two or three good-sized *Heteromera* also occurred. A *Cicindela*, not unlike *campestris*, was common in muddy places: two very pretty species of *Cychrus*, and a handsome *Carabus* with brown wing-cases, occurred in the marshy ground about the lakes, with other *Geodephaga*: and among other interesting genera I may mention *Necrophorus* (several species under dead birds, &c.), *Anisotoma*, *Amphotis*, *Nosodendron*, *Anthribus*, *Molorchus*, (a very fine, large species, of exceedingly wasp-like aspect), *Opilus*, *Sinodendron*, &c. A fine, dark brown Longicorn, not unlike the European *Criocephalus rusticus*, flew on board the ship in large numbers during several evenings in August, being evidently attracted by the scent of the newly-tarred rigging.

Nearly every pine stump in the woods was more or less infested with a large species of *Termes*; the "soldiers" being fully an inch long, with huge crooked jaws. The winged forms flew in thousands on still evenings in August just before sunset; it seemed strange to meet with these insects, usually associated in our minds with the tropics, in lat. 49° N. *Orthoptera* were exceedingly abundant, one very conspicuous grasshopper, with bright yellow hind-wings, was remarkable for the noise it made when flying, exactly like a watchman's rattle, and audible, I should say, at 100 yards distant. Wasps were most unpleasantly numerous, and, although for the most part small, were particularly fierce and venomous: some of their nests built in trees, were of very beautiful construction, but dangerous to approach, as I found more than once. During September, I beat a good many Lepidopterous larvæ from small oaks, &c., but found a large proportion infested with Dipterous parasites, not one individual of several species being free from them.

13th December. I have written up this letter at intervals during our voyage from Esquimalt to Callao; we left on October 29th, and, having encountered very rough weather outside Vancouver Island, we had to put into San Francisco, to

replenish with coal. We stayed here only two days, leaving on November 7th: our passage from thence to Callao was pleasant enough, but very monotonous. I saw a good many specimens of the oceanic bug, *Halobates*, sp.?, on November 26th, about 400 miles from the nearest land, and caught a few for Dr. Buchanan White. They are curious little ivory-legged fellows, resembling our familiar "*Gerris*" in structure and habits, and they skip about in the net when caught in just the same manner: they are apterous, and covered with silky bluish-white down, which carries down a supply of air to serve them when they dive beneath the surface, which they do very readily on the approach of the net. They are only seen when the sea is perfectly calm. I tried to keep two or three in a large bottle of sea-water, but they very soon died.

As regards our future movements, I hear we are to remain at Callao for about two months, and then to go on to Tahiti: it is at present only a rumour, which I hope will turn out to be true, as I should very much like to see some of the islands, having done so much of the coast.—J. J. WALKER, H.M.S. "Kingfisher," Callao: 13th December, 1882.

P.S.—I could not find any *Trichopterygia* at Esquimalt, though I tried more than once for them. I hope to be more successful here.—J. J. W.

On the probable identity of the species known as Agrotis tritici, aquilina, obelisca, and nigricans.—One summer, many years ago, I beat out of some ivy which covered the wall of a garden in this town, a great variety of common *Noctua*, and among them numerous specimens of *Agrotis nigricans* and *tritici*, and two each of *aquilina* and *obelisca*. I remember having been much surprised at the time at the occurrence of the last two species, the examples of which I still possess; but as an explanation, which will most likely equally surprise most of those who read it, I send the following notice, translated from the *Jahrbücher des Nassauischen Vereins für Naturkunde*, xxxiii—xxxiv, 1880—1881, p. 87.

Perhaps some of our English Entomologists may be able to corroborate the truth of a proposition, which, so far as I can find, has never yet been ventured here, that *nigricans*, *tritici*, *aquilina*, and *obelisca* are all variant forms of one and the same species.—W. WARREN, Merton Cottage, Cambridge: February, 1883.

Jahrbücher des Nassauischen Vereins für Naturkunde, xxxiii—xxxiv, 1880—1881, p. 87. (Die Schnuppenflügler des kgl. Regierungsbezirks Wiesbaden und ihre Entwicklungsgeschichte. von Dr. Adolf Rössler).

"*A. tritici*, L., is certainly the most variable of all our *Noctua*, in size, markings, and colour; nay, even the antennæ seem not to be quite the same in all examples. We had an opportunity of assuring ourselves on this point very completely. The devastation caused in vineyards on the frontiers of Moravia, recorded by Treitschke in vol. x, pt. 2, p. 19, of Oechsenheimer's work, has been repeated in our neighbourhood, at Ockelheim, near Bingen, in the years 1871 and 1872, to such an extent, that many individuals had their vineyards destroyed.

"Hundreds of larvæ were collected here in both years, of which the following description was taken—Very much like those of *segetum*, averaging an inch in length, yet very unequal in size, cylindric, stout in proportion to their length; colour that

of the surface of the ground, sometimes lighter, sometimes darker, varying from dirty whitish-yellow to dark red-brown and yellow-brown. Head semicircular, light brown, with two dark lines; on the crown a collection of black spots. Plate on 2nd segment black-brown, with a central line and two side lines paler. Dorsal surface always lighter than that of the sides, in which respect there exists a likeness to the larvæ of the *Caradrinæ*. Dorsal line dark, divided by a pale line. Beneath the dark, straight, broad, sub-dorsal line there is indicated another fine lighter line. The blackish-brown spiracles stand on the border where the dark lateral and the pale ventral colours unite. Obliquely above and under each spiracle is a black-brown, horny, raised spot; these spots, like the plates on the second and anal segments, are weapons of defence for the larva when forcing its way into the ground; and there are others besides, in the place of the spiracles on the first segment, in the middle of the back, on the sub-dorsal lines, perpendicularly above and beneath each leg, and on the lateral edge these spots, like the head, are beset with short bristly hairs.

"The larvæ lived exactly like earthworms, by day underground, and by night only on the surface, in order to feed. Salad and such like succulent plants were much more relished by them than the tenderest shoots of the vine. The pupa, which possesses an extremely thin shell, lay in an earthen cocoon. Dr. Pagenstecher bred a large number of the larvæ with the same results as myself. I have already given an account of my first brood in the *Jahrb. des Nass. Naturvereins* for 1871—1872. Later on the larvæ had again disappeared, without any human means having been of any avail against them. In September, occasionally a few pass through their stages, and appear in the perfect state as rather smaller specimens than those of the first brood; but the large majority hibernate as larvæ. The perfect insects conceal themselves by day on the earth, in deep crevices of the bark of trees near to the ground, in chinks of stones, &c.

"Among the large number of examples reared in the course of these broods, there were those figured by Hübner* as *fumosa*, fig. 153, *aquilina*, 135, *obelisca*, 123, *fictilis*, 479 and 710, *unicolor*, 544, *erata*, 623, *carbonea*, 700, *praticola*, 567, *vitta* and *aquilina*, 533—35, *ruris*, 416; besides the following figured by Herrich-Schäffer, *adumbrata*, 121, *rustica*, 495, *fumosa*, 526, *tritici*, 527 and 552, *obelisca*, 529 and 553. All were plentifully represented, and it could not but be that all belonged to one and the same species, united as they were by numerous intermediate forms. Among them were several forms, especially of *fumosa*, of a beautiful lilac tint, which, however, faded into grey in the course of a year. One *obelisca* was entirely lilac coloured without markings, with a white costal streak. Of varieties collected at the same time by night, there are besides to be mentioned a pale yellowish example, devoid of markings, with perfectly black outlines of the stigmata; and one found by Dr. Schirm, leaden coloured throughout without markings on the fore-wings, of which only the margin of the reniform stigma is indicated by a black spot. It is not improbable that there are besides other nearly-related forms not occurring here,

"* Mr. Buckler describes, in the *Ent. Mo. Mag.*, 1865, pp. 133 and 152, the larvæ of *aquilina* and *fumosa*, and finds in all respects a great similarity, but states, the latter may be distinguished by a double streak above the feet, and by the black warty spots (my larvæ, however, all had these). As he did not breed the larvæ from the egg, but had them sent by others, and could not, therefore, compare them from youth upwards, while I, on the other hand, bred no quite black examples of *nigricans*, but only grey ones, though marked in the same way, it will be just as well, perhaps, to try again, and to rear a brood from the egg."

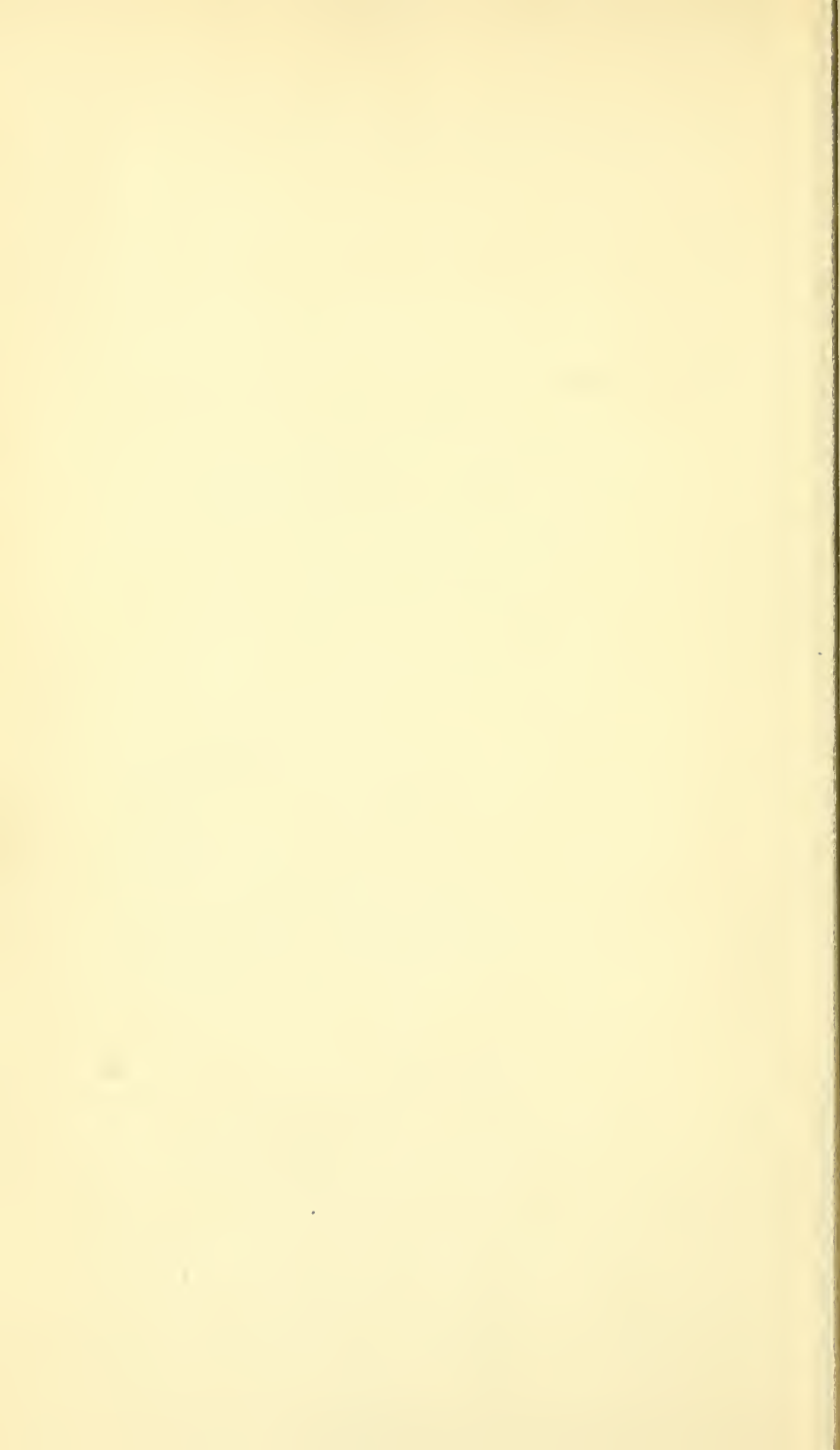
which now pass as separate species, that likewise belong to *tritici*. The insect is a native not only of the district of the so-called European fauna, but, along with many others of our species of *Agrotis*, of North America also."

Capture of Mixodia rubiginosana, H.-S. (= *Pœcilochema* Bouchardana, Doubdy.), and other local species in West Norfolk, last season.—Among captures made by my brother and myself in this district last season, were some which we were unable to name with certainty. These I sent to Mr. C. G. Barrett, who kindly named them for me. I was not a little surprised to find that *Mixodia rubiginosana* was amongst them. Five specimens of this species were taken by my brother on or about the 16th of June, in extensive fir-woods on rather elevated ground, about seven miles from this town. From enquiries I have made, it would appear that the species was probably introduced with trees obtained from Scotland and planted here, some twenty years ago. From the same locality and on the same day, two fine specimens of *Cryptoblabes bistriga* were boxed, and not more than half a mile from the woods on wet ground, a single representative of *Cosmopteryx Lienigiella* was met with. During the next month (July), whilst collecting *Stathmopoda pedella* among alders, a brilliant little micro was found in the net, which turned out to be *Bohemannia quadrimaculella*. In all, four specimens of this pretty little insect were taken. *Tinagma resplendellum* also occurred among alders.—EDWARD A. ATMORE, 8, Union Street, King's Lynn, Norfolk: April, 1883.

Spring Hymenoptera at Hastings.—I was at Hastings this year from the 22nd to 27th of March, and succeeded in capturing a fair number of the ♂ and ♀ of *Andrena lapponica* in the same locality near Ore, where I took the ♀ in April last year. I think this is worth recording, as I believe the ♂ has only been taken hitherto at Moffat and Bristol; in that locality I could find no other *Andrena* besides *lapponica*, but I met with a number of *A. Gwynana* near Fairlight Glen, in the exact spot where I took *A. bicolor* plentifully in August, 1879. This quite confirms the view that these two so-called species are only different broods of one.—E. SAUNDERS, Holmesdale, Upper Tooting: 16th April, 1883.

Obituary.

Professor Zeller. On the 27th March, Philipp Christoph Zeller died quite suddenly, of heart disease, at his residence, Grünhof, near Stettin. For more than forty years the name of Zeller has been constantly on the lips of Lepidopterists in Europe, and latterly his fame was as widely extended across the Atlantic and in our Australian colonies. His correspondence must have been very extensive, yet he was always ready to answer queries on any subject referring to his favourite branch of entomology, and though he had nearly completed his 75th year, he had not ceased to be a writer of long and neatly legible letters, nor were his scientific labours, especially in reference to Exotic *Micro-Lepidoptera*, supposed to be at all near their close. We hope to give a more detailed notice of the illustrious Professor in our next number.



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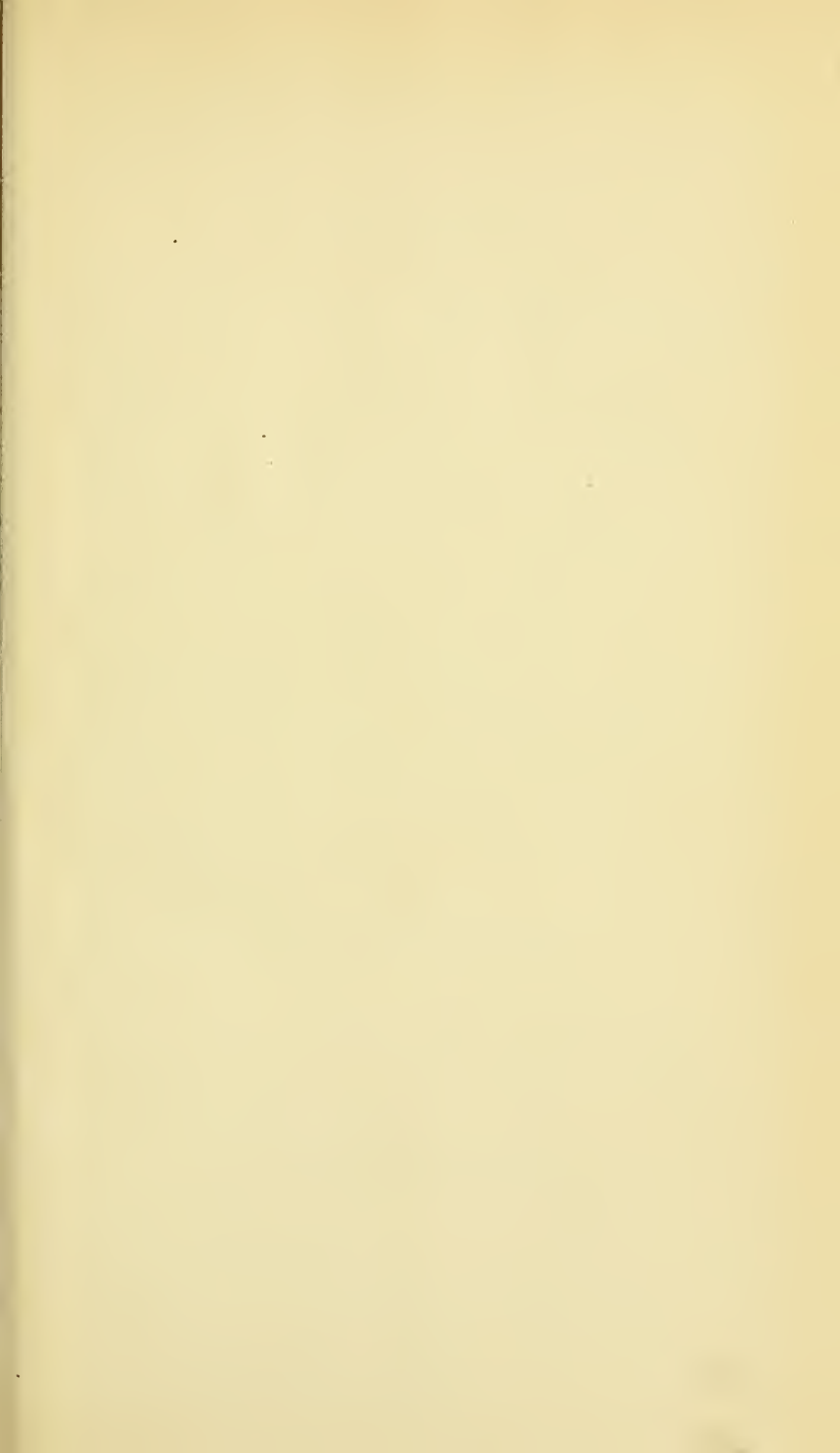
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ERRATA.

Page 28, line 7 from bottom, for "*dodoneata*," read "*abbreviata*."

„ 121, „ 11 „ top, „ „ "fine," „ "five."

„ 199, „ 2 „ bottom, „ „ "nastrosjos," „ "rastrosjos."

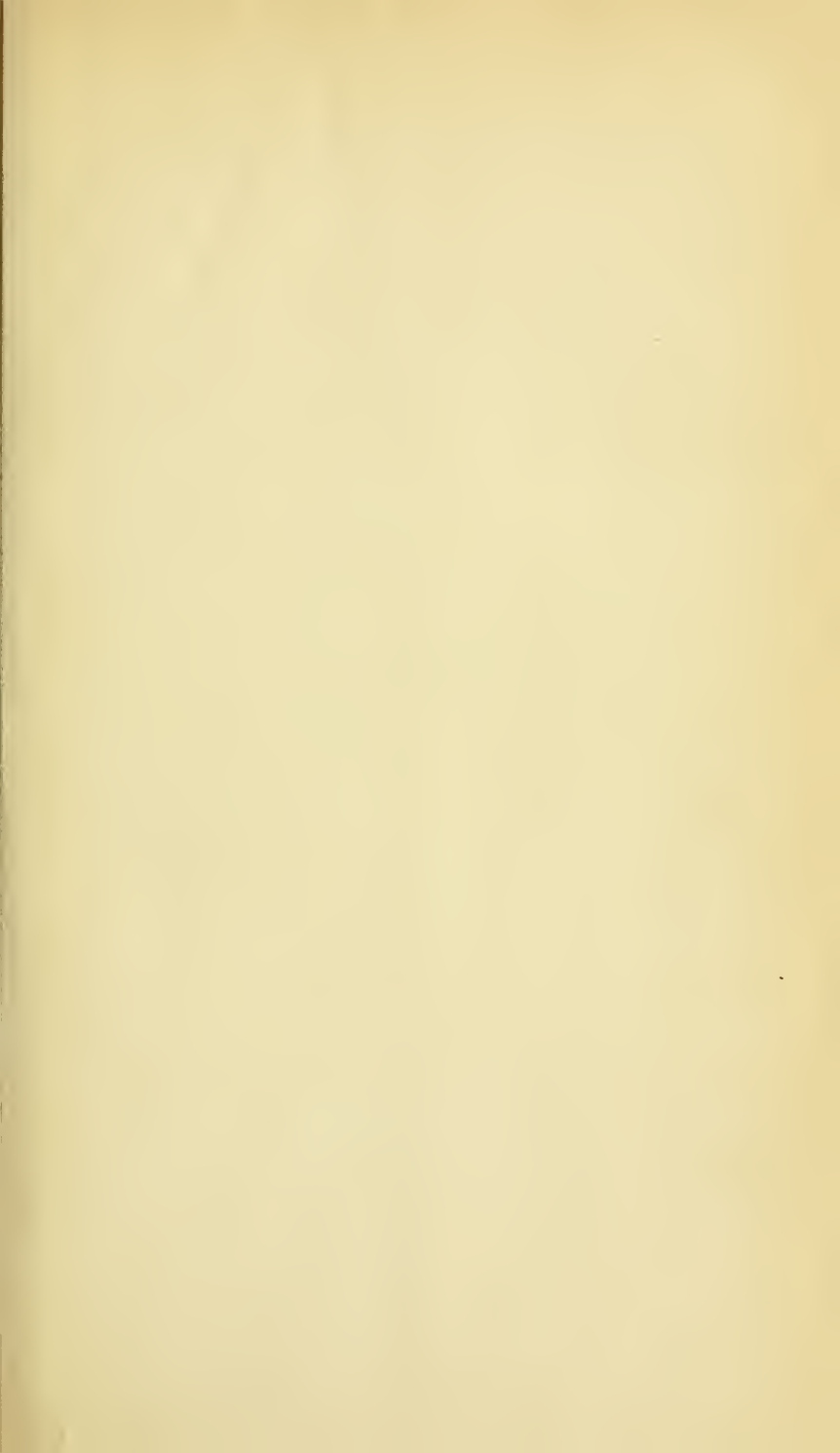
„ 201, „ 7 „ „ „ "Aubonium," „ "Aulonium."

„ 202, „ 18 „ „ „ "Phrenapetes," „ "Phrenapates."

„ 204, „ 20 „ top, „ „ "guava," „ "guavo."

Pages 211—213, for "Nayland," read "Myland."

Page 249, line 29 from top, after "highlands," read "of Guatemala the fauna partakes, &c."





PROF. P. C. ZELLER.

Kof-Lithograph A. Hochstetter, Stettin

Entomologist's Monthly Magazine

VOLUME XX.

PHILIPP CHRISTOPH ZELLER,

BY H. T. STAINTON, F.R.S.

Philipp Christoph Zeller (to quote his own words) "was born April 9th, 1808, at Steinheim, in the Kingdom of Württemberg." (As it appears there are two Steinheims in Württemberg, Hagen, in his "Bibliotheca Entomologica," mentions more precisely that it was at Steinheim on the Mürr; this is only two miles from Marbach, the birth-place of Schiller). "Early in life," he says, "he came to Frankfort on the Oder, so that he had no recollection of the place of his birth. How and when there first arose in him a love for *Lepidoptera*," he, writing in 1851, "had no recollection, but," he adds, "it must have been in very early youth."

"My father disliked this fancy of mine, and I can still very well remember how, on one occasion, I was beaten, when, instead of executing some commission, I went chasing *Pieris brassicæ*, which, as at that time I had no entomological apparatus, must have been by the aid of my jacket or overcoat. But my predilection for Butterflies was not driven out of me, on the contrary, it developed more and more, and when I went to the Gymnasium, I made many excursions after *Lepidoptera* instead of going into the mathematical lecture-room, which was not quite so much to my taste."

"In 1823 I commenced a Lepidopterological Journal, and I also described larvæ and painted butterflies; these descriptions and figures are now mostly lost, as afterwards, I became ashamed of them. At the Gymnasium I received no instruction in Natural History, but I owe much to my old friend Metzner, who lent me books, of which I copied out the greater part. This system of copying, which I continued in after years, has, notwithstanding my limited means, placed me, by degrees, in possession of a more complete literature of my hobby than one finds amongst most Lepidopterologists."

"It was not till I went to the University of Berlin that I had any instruction in Natural History, and even then only in Botany, as I looked upon Natural History only as an object of relaxation, and for

this reason also, I neglected to make the acquaintance of the Entomologists at Berlin, which I now much regret."

"After passing my examination, I returned to the Gymnasium at Frankfort on the Oder, in 1830, and now began to devote all my leisure time to Entomology and Botany; for some years I rather neglected *Lepidoptera* for *Coleoptera* and *Diptera*."*

"In 1833, however, I made the acquaintance of Fischer-von-Röslerstamm, and then returned with eagerness to the study of *Lepidoptera*. I can, however, truly say, that if I have attained any correct views, I do not owe them in any degree to the study of writers on the Order *Lepidoptera*, but rather to the Coleopterologists, and above all things to the Dipterologist, Meigen."

As an instance of an early entry in Zeller's Journal may be given the following, dated July 12, 1829. "In the early morning about 5 o'clock some very pretty moths were flying from fir-trees at Tegel (near Berlin); of these I caught 2, one good and the other bad, the latter I threw away." Many years afterwards the name of the insect was added to this entry "*Ecophora Borkhausenii*."

The earliest printed notice of Zeller occurs, I believe, in Treitschke's "Schmetterlinge von Europa," IX, 2, p. 262, published in 1833; he is there described as "Herr Candidat Zeller in Frankfort an der Oder, a zealous friend of Entomology," the notice refers to the rearing of a number of *Tinea tapezella* from a decayed hoof of a horse.

In the 3rd part of Treitschke's 10th volume, published in 1835, Zeller is three times mentioned, at pp. 141, 153 and 187; in the second of these notices he is spoken of as "Herr Oberlehrer Zeller in Glogau," showing that between 1833 and 1835 he had removed from Frankfort on the Oder to Glogau, and had developed from a "Candidat" to an "Oberlehrer."

Oken, the Editor of the "Isis," had offered a prize for the best essay on the determination of the *Lepidoptera* which were noticed in Réaumur's "Mémoires pour servir à l'histoire des insectes," and of the two essays sent in to compete for this prize, the first prize was awarded to P. C. Zeller, Oberlehrer an der evangel. Bürgerschule in Gross-Glogau.† This "Kritische Bestimmung" extends to 112 columns (56 pages quarto), and revealed at once uncommon powers in the new writer, who, thus in 1838, made his first appearance as an author.

* Between 1840 and 1847, he published several Dipterological papers, and one on a Coleopterous subject, as may be seen in Hagen's Bibliotheca Entomologica.

† The second prize was awarded to C. F. Freyer of Augsburg, the illustrious author of the "Beiträge" and "Neuere Beiträge."

He had, however, been already working for some time at a Classification of the *Tineacea*, and it was no doubt, in some degree, owing to the encouragement derived from his successful determination of so many of Réaumur's *Lepidoptera*, that an epitome of this Classification appeared in the "Isis" of the following year, 1839.

This epitome, entitled "Versuch einer naturgemässen Eintheilung der Schaben" (an attempt at a natural arrangement of the *Crambina* and *Tineacea*), extends to 54 columns (27 pages quarto).

In it the *Crambina* are divided into two groups, the true *Crambina* comprising 4 genera, and the *Phycideæ* comprising 7 genera; the *Tineacea*, not divided into groups, comprise 42 genera, of which two, *Coryptilum* and *Stenoma*, were founded solely for the reception of exotic insects (from Java and North America), so that the European *Tineacea* were comprised in 40 genera.

This classification is such a vast stride on anything that had previously appeared in the pages of Duponchel, Stephens and Treitschke, that one looks upon it with amazement, whilst reflecting that it is really the maiden essay of a new author; for though the determination of Réaumur's *Lepidoptera* had been published a few months previously, and hence appears as the author's first work, this classificatory essay had been the work of Zeller during many previous years.

Unfortunately, in the pages of the "Isis" it remained too little known, for though it may be said without hesitation, that no Entomological Library can be complete that does not contain those volumes of Oken's "Isis" in which Zeller's papers have appeared, yet it is only too rarely they are found on an Entomologist's book-shelves.

The same volume of the "Isis" (1839) contained two other papers by Zeller; one, the determination of the *Lepidoptera* mentioned in De Geer's "Mémoires," the other, a critical notice of Freyer's determination of Réaumur's *Lepidoptera*; for, as may be easily supposed, the two authors had not in all cases concurred in their determination of Réaumur's species.

In the "Isis" of 1841 appeared a treatise on the *Pterophoridaæ*, and in that of 1844, a Monograph of the genus *Hyponomeuta*; more than half of the year 1844 (from January to August) was devoted to an Entomological expedition to Italy and Sicily, where a rich harvest of observations was made, to be afterwards recorded in the pages of the "Isis."

The "Isis" of 1846, contained two important works from Zeller's

pen.—1^o His notes to the Lepidopterological Fauna of Lievland and Curland, by Madame Lienig. These notes contain a valuable mine of observations, especially amongst the *Geometridæ* and the *Micro-Lepidoptera*. 2^o A treatise on the knot-horned *Phycidæ*.

During the eight years which had elapsed since his first appearance as an author, numerous smaller papers had appeared, either in the "Isis," or in the organ of the then newly-founded Entomological Society at Stettin, the "Stettiner entomologische Zeitung." This Society, in 1846, commenced an important new work, the "Linnæa Entomologica," for the reception of more extensive Monographs, which were in their nature rather too bulky to appear in the "Zeitung," which at that time, and for many years afterwards, was issued in monthly numbers.

The first volume of the "Linnæa Entomologica" contained two elaborate papers by Zeller, on *Lithocolletis* and on *Eudorea*, the two together forming nearly one-third of the volume; each was illustrated by a Plate, and these Plates appealing at once to the eyes of those who were still ignorant of the German language, gave an impulse to its study among the Entomologists of other countries, the beneficial influence of which it seems impossible to exaggerate.

Another result of the publication of the "Linnæa Entomologica" was that it led to a more extended knowledge amongst other Entomologists of Zeller's earlier papers, that had appeared in the "Isis," but which had previously existed too much like a buried treasure.

The discovery in 1847 of "the attempt at a natural arrangement of the *Crambina* and *Tineacea*," which, though published eight years previously, now first became known to English Entomologists, came like a ray of sunlight to those who had hitherto been groping very much in the dark, and had been puzzling and perplexing themselves how they were ever to decide whether an insect was a *Microsetia* or an *Amaurosetia*, names which must sound strange to the Entomologists of the present day, but which were once "familiar in our mouths as household words."

In less than three years from the publication of these Monographs on *Lithocolletis* and *Eudorea* in the "Linnæa," we find Zeller actively in correspondence with three English entomologists: Stainton, Henry Doubleday, and Douglas. But to recur to the works of the author which followed 1846, before this intercourse with English entomologists began, and which was to be continued in a regular and steady stream to the end of his days:—

In 1847 there appeared in the "Isis" his "Remarks on the *Lepidoptera* collected during a journey in Italy and Sicily" (the journey in 1844 to which we have already alluded), and the same year there appeared in the "Linnæa Entomologica," vol. 2, his treatise on *Argyresthia*.

In 1848 there appeared in the "Isis" his treatises: 1st, on the *Galleriæ* and naked-horned *Phycidæ*, and 2nd, on the exotic *Phycidæ*, and in the third volume of the "Linnæa Entomologica" his Monograph of "the Genera of leaf-mining *Tineidæ* with Eye-caps" (*Lyonetia*, *Opostega*, *Bucculatrix*, *Nepticula*, &c.).

Unfortunately, 1848 was the year of Continental Revolutions, and partly owing to the political disquiet of the time the "Isis von Oken" (commenced in 1817) thenceforward ceased to appear. For all naturalists, the discontinuance of this valuable miscellany was a great deprivation, but to Entomologists in particular, who had seen its pages of late years so largely filled with the writings of P. C. Zeller, the loss was immense.

In 1849, Zeller produced, in the 4th volume of the "Linnæa Entomologica," a treatise of more than 200 pages on *Coleophora*; and in that and the following year he gave, in the pages of the "Stettiner entomologische Zeitung," an elaborate notice of the *Lepidoptera* collected by Herr Joseph Mann in Tuscany, in 1846.

In 1851 appeared, in the 5th volume of the Linnæa, a treatise on the three genera, *Incurvaria*, *Micropteryx*, and *Nemophora*, and in the following year, in vol. 6 of the same work, was a Monograph of the other *Tineidæ* with long maxillary palpi (*Euplocamus*, *Tinea*, *Eriocottis*, and *Lampronia*), and also a revision of the *Pterophoridæ*.

In 1852 it was that Zeller, who had lately received from the King of Prussia a special award of the title of Professor, visited England in company with his friend, Dr. C. A. Dohrn of Stettin. This visit occurred in the month of July and only lasted a fortnight, but during that period he visited four Entomological localities: Charlton sand-pit, West Wickham Wood, Mickleham and Sanderstead;" he also visited Professor Westwood at Hammersmith, and Henry Doubleday at Epping. It is, however, to be feared that this visit was not one of pure enjoyment, as the worthy Professor's stomach had been more or less disarranged by the transit from Ostend to Dover, and the "sentiment of the water," as he expressed it, still remained with him the greater part of his visit, besides, he had a great aversion to the smell of camphor (a perfume of which English Entomologists,

habituated to it from their earliest boyhood, are utterly unconscious), and was at the same time very unwilling to have a breath of fresh air admitted by an open window.

In 1852 appeared also the 7th volume of the "*Linnaea Entomologica*," in which Zeller treated of the genera *Lypusa*, *Talæporia*, *Solenobia*, *Diplodoma*, and *Xysmatodoma*; and in the same year he also described Wahlberg's Caffrarian *Micro-Lepidoptera* in the Transactions of the Stockholm Academy of Sciences. The following year the genera *Adela* and *Nemotois* were treated monographically in the 8th volume of the "*Linnaea*," and a critical determination of the species figured by Clerck in his "*Icones*" appeared in the "*Stettiner entomologische Zeitung*."

In 1854, Zeller gave, in the 9th volume of the "*Linnaea*," the genus *Depressaria*, and several allied genera (including 26 species of the genus *Cryptolechia*). The tenth volume of the "*Linnaea*," in 1855, contained a postscript on *Cryptolechia*, with descriptions of 13 new species, and also an elaborate Monograph of the very difficult genus *Butalis*. This was, we regret to say, the last of his masterly contributions to the "*Linnaea Entomologica*." It was towards the end of May, 1855, that the writer of these lines had the pleasure of seeing Professor Zeller in his home at Gross-Glogau, and after spending two days there, of meeting him for several days the guest of Dr. Dohrn at Stettin and at Hökendorf.

In 1855 appeared the first of the 13 volumes of the *Natural History of the Tineina*, by Stainton, assisted by Zeller and Douglas; of this series the whole of the German and Latin letter-press was translated by Professor Zeller from the original English, and he also contributed many valuable remarks.

At the end of March, 1860, Zeller left Gross-Glogau in Silesia, where he had resided for a quarter of a century, for Meseritz, in Posen, where he still continued his scholastic employment. Here, in 1863, he wrote his Monograph of the *Chilonidæ* and *Crambidæ* of 54 quarto pages—this was printed as an Appendix to a "*Schulnachricht*," and it is a very nice question, whether it was ever published. The date on the Monograph itself was not printed.* In 1865 a troublesome and painful illness necessitated his absence from Meseritz for some weeks, and he spent the greater part of June and July in that year at Frauendorf, near Stettin. In May, 1866, he retired from his school-occupation, and had thenceforward more leisure to devote to Entomo-

* "Dass das Datum der Publikation schriftlich eingetragen worden ist, hat seinen Grund darin, dass die Jahreszahl sich auf dem Titel der hier weggelassenen Schulnachrichten befindet."—P. C. Zeller in *lit.*, 21.7.63.

logy. An intended excursion to Carinthia, contemplated for 1866, was necessarily deferred on account of the war between Prussia and Austria; but, in 1867, June and July were spent at Preth and Raibl in Carinthia, and a few days on the return journey at Bruck on the Muhr, and at Vienna.

Notices of his observations during this excursion appeared in 1868 in the "Stettiner entomologische Zeitung," and in the "Verhandlungen des zoologisch-botanisch Vereins in Wien." At the end of April, 1869, Zeller removed to Grünhof, near Stettin, where he found useful and congenial occupation in the post of Librarian to the Stettin Entomological Society, and here he found himself fully occupied with his extensive scientific correspondence, and in the determination of the *Micro-Lepidoptera* which were sent to him from various parts. From his retreat at Grünhof, he three times made prolonged stays at Bergün in Switzerland, situated at the northern extremity of the Albula Pass in the Grisons; thus, in 1871, he was at Bergün from May 31st to the end of July, in 1873, from June 24th to the end of August, two days (July 5th and 6th) having been spent at Weissenstein, and in 1875 he arrived at Bergün at the end of May, removing to Weissenstein on the 11th July, where he remained to the beginning of August. He had thus collected in abundance the materials for a Lepidopterous Fauna of the Albula district, of which a first instalment appeared in the "Stettin. Entomol. Zeitung" for 1872, followed by a more exhaustive treatment of the subject in the same periodical in 1877 and 1878.

After 1875, Professor Zeller made no extended journey, but he several times went to Swinemünde, accompanied by his daughter, Mrs Jänicke, to search on the coast sand-hills there for the very singular *Dactylota Kinkerella*; the insect, however, was not to be found by him.

In his later years, Zeller devoted much of his attention to the critical investigation and description of *Micro-Lepidoptera* from various parts of the world, and most valuable papers from his pen on "North American *Micro-Lepidoptera*," and on "Exotic *Micro-Lepidoptera*," appeared in the "Verhandlungen des zoologisch-botanisch Vereins in Wien" in 1872 and 1873, and in the "Horæ Societatis Entomologicæ Rossicæ" for 1877 and 1881.

Zeller, who had been in the enjoyment of his usual health at the commencement of the present year, was actively corresponding and readily answering any queries as to observations he had made fully thirty years ago, and to all appearance there were still years of good scientific work before him.

On Good Friday, March 23rd, he was attacked with a sudden pain of the heart. Doctors were hastily sent for, and the first who reached him (Dr. Sauerhering) found his pulse very faint, but otherwise no symptom of importance; by the time Dr. Schleich reached him the pulse was again normal, and he saw no cause for serious anxiety. The three following days passed without any recurrence of the attack, and on Tuesday, March 27th, he rose at his usual early hour, declaring that he felt quite well, and proceeded to correct a sheet of the "Stettiner entomologische Zeitung," which contained a paper by Heinrich Frey of Zürich. Soon afterwards, his wife brought him some cold meat and bread and butter, on which he set to work with appetite, and Mrs. Zeller retired to an adjoining room; soon after hearing her husband twice groan or cry out, she hurried back—he lay dead on the floor.

Zeller was married in 1833 to the lady who survives him; a son died very young, a daughter, who married in 1864 Dr. Jänicke of Wrietzen (but was too soon left a widow), has two children—the boy, like his grandfather, shows a greater predilection for Entomology than for his severer studies, but this *tendency to atavism* on the part of the rising generation was not viewed with indulgence by the aged Professor, who seemed to have overlooked that his own early life was repeated by his grandson.

It has been well said of Professor Zeller "that he always struck one as a very thorough man in what he did—one who had trained his mind well, and who thought and wrote with fullness and precision."

As might almost have been expected from the date of his birth, and the period of his greatest intellectual growth, Professor Zeller never made any approach to an approval of Darwinism.

His collections are in good hands, having been purchased by Lord Walsingham.

Mountsfield, Lewisham :

May, 1883.

Lebia turcica in the Hastings district.—On April 30th, while working at some birch stumps in a clearing near Guestling, I took a beetle which I did not recognise. When it was set, I at once identified it as *Lebia turcica*, F. In Cox's Handbook this species is merely described as "rare," but I have been informed that it has lately been placed amongst the "reputed" British species, a fact which renders its occurrence in this district doubly interesting. I have again visited the same locality, but so far without success.—W. H. BENNETT, 11, George Street, Hastings, May, 1883.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from Vol. xix, page 220).

21. ACANTHIPTERA, Rond.

Pegomyia, Macq.*Anthomyia*, Meig., Schin.*Anthomyza*, Zett.

Gen. ch.—Head nearly semi-circular; eyes bare, approximate in both sexes; arista long and pubescent; alulets well developed, the lower scale being considerably longer than the upper; abdomen elongated, tapering, and sub-cylindrical in the male, ovato-conical in the female: wings with auxiliary vein armed with spines, and anal vein not reaching the margin: legs yellow, elongated (especially in the males), and with large pulvilli.

A. INANIS, Fall.

Only one European species is known in this rather peculiar genus; it has the head similar in shape to those in the genus *Homalomyia*. The colour is totally yellow, with the exception of a bluish-grey spot on the dorsum of the thorax, and the joints of the tarsi, all of which are nigrescent in the females, but only those of the hind legs in the males. Not common. The larvæ are said to have been found in wasps' nests.

22. PEGOMYIA, Desv., Macq.

Anthomyia, Meig., Schin., Rond., p.*Anthomyza*, Zett.*Chortophila*, p., Rond.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in the males, remote in the females; arista pubescent or bare; abdomen sub-cylindrical or depressed in the males, ovato-conical in the females; alulets variable in size, mostly small, but sometimes with the scales pretty well developed and of unequal lengths: wings with the anal veins prolonged to the margin: legs always partly yellow, and abdomen mostly wholly or partially so, as well.

Sect. 1—*Abdomen wholly or principally black or grey.*

1. BETÆ, Curtis.

sulcans?, Rond.

2. CONFORMIS, Fall.

3. HYOSCYAMI, Panz.

chenopodii, Rond.

4. HÆMORRHOU, Zett.

Sect. 2—*Abdomen red or yellow.*Div. i—*Alulets moderate in size, with scales of unequal length.*

5. RUFIPES, Fall.

7. TRANSVERSA, Fall.

6. WINTHEMI, Meig.

8. LATITARSIS, Zett.

Div. ii—*Alulets small, with equal sized scales.*

9. BICOLOR, Wdm.

12. VERSICOLOR, Meig.

mitis, Meig.

13. FLAVIPES, Fall.

strigipes?, Zett.

14. VITTIGERA, Zett.

10. NIGRITARSIS, Zett.

gilva?, Zett.*fulgens*, Schin., non Meig.

15. ROTUNDICORNIS, Zett.

11. EXILIS, Meig.

The flies included in this genus are some of them more highly developed than others, having larger alulets and wider bodies; Rondani, therefore, placed them partly in his genus *Anthomyia*, and partly in *Chortophila*; the greater number of them, however, have their principal characters in common, possessing yellow bodies and legs, and form a natural group: to these I have joined a few others which closely resemble some of those in the genera *Chortophila* and *Phorbia*, but differ in having the legs always partially yellow. R. Desvoidy formed this genus to include those flies which feed in the larva state upon the parenchyma of leaves; but though most of the species included in it do thus blotch or mine the leaves of various plants, the habit is not peculiar to them, for some of the species in the genus *Phorbia*, as I have already mentioned, do the same.

P. BETÆ, Curtis.

The male of this species was well described by Curtis in the Journal of the Royal Agricultural Society of England in 1847;* he overlooked, however, one important point, describing the palpi as being black, whereas they are always yellow with black ends or tips. The antennæ are wholly black; the femora and tarsi are all black in the males, the tibiæ only being yellow or piceous in dark varieties; in the females the femora of the four posterior legs are usually pale or yellow, while those of the front pair are black or grey on their upper surfaces.

This fly, which was formerly considered rare, and was but little known, has come into rather prominent notice of late years, owing to the injury which it causes in the larva state to the agriculturist, by feeding upon the leaves of the mangold wurzel. It also mines the leaves of other species of beet and *Chenopodium*, and Mr. Inchbald sent me specimens bred from spinach leaves.

P. CONFORMIS, Fall.

This species bears considerable resemblance to the last. The female only has been described, the male being unknown until I received a specimen in May, 1882, from Mr. Inchbald, together with a female, both of which he had bred from the

* Vol. viii, pt. ii, p. 412.

leaves of *Arctium lappa*, upon which the larvæ had fed. The male bears a considerable resemblance to that of *P. betæ*: the face is rather prominent; eyes contiguous; antennæ rather short, entirely black; palpi yellow, with black tips; thorax dark grey, very indistinctly striped; abdomen narrow, sub-cylindrical, light grey, with a very slightly marked dorsal longitudinal stripe and large projecting sub-anal processes of a reddish colour; the fore legs have the femora and tarsi black, and the tibiæ only red; the four posterior legs have the femora, as well as the tibiæ, red. The female has the face more prominent than that of the male, and, together with the forehead, cheeks, and basal joints of antennæ, of a bright yellow colour. The thorax and abdomen are both immaculate and light grey; the legs have all the femora and tibiæ yellow. Rare: besides the pair which I received from Mr. Inchbald, I have two females which I captured at Windermere in 1874.

P. HYOSCYAMI, Panz.

In this species the abdomen is usually described as being of a light grey colour, especially in the male; but it will often be found to have a pale testaceous tinge in both sexes, when it corresponds to the *C. chenopodii* of Rondani. The back of the abdomen is marked with a longitudinal row of narrow triangular spots in both males and females, very similar to those seen in *P. betæ*. The palpi are yellow with black tips; the basal joints of the antennæ are yellow; and the legs have all the femora and tibiæ pale, with the exception of the fore femora in the male, which are partly grey. This rare species is said to feed in the larva state upon the leaves of the henbane, and Rondani says that he has bred the pale bodied variety from those of the deadly nightshade (*Atropa belladonna*), as well as from some species of *Chenopodium*.

P. HÆMORRHOUM, Zett.

The female of this species closely resembles that of *P. conformis*, but differs in having the last two segments of the abdomen red or yellow. The palpi are yellow with black tips; the antennæ are wholly black in all the specimens that I have seen, but Zetterstedt says that they are often red at the base; the fore femora are black or grey, but all the others, as well as all the tibiæ, are yellow. Zetterstedt only knew the female when he published his description in the 4th vol. of the Dipt. Scand.; but in the 14th and Supplementary volume of the same work he gives a very imperfect account of the male. In several specimens which I possess of that sex, the abdomen is sub-cylindrical, entirely grey, having dark reflections, but no distinct markings; the anal segment is incurved, grey, with two projecting processes of a black colour; the eyes are sub-contiguous; the forehead prominent; the antennæ wholly black as well as the palpi; the legs are coloured as in the female, but the fore femora are only black at their bases. This species is not uncommon near Bradford, but the females are more frequently met with than the males.

P. RUFIPES, Fall.

Only the male is known of this species, which is one of the most highly developed in the genus, the scales of the alulets being of considerable size, and the abdomen widened. The antennæ and palpi are black, the latter, however, being sometimes pale at their bases; the legs are entirely rufous, with the exception of

the tarsi, which are black ; the fore femora are, however, often darker than the others (piecous). Rare. I have two specimens, one found near Bradford, and the other in Oxfordshire.

P. WINTHEMI, Meig.

This species, like the last, has the alulets comparatively large. It is characterized by the abdomen, which is yellow, being marked on the lower edge of each segment by a transverse black line ; the antennæ are black in the males, but have the two basal joints pale in the females ; the palpi are yellow ; the thorax is dark grey, the apex of the scutellum and the sides of the thorax being often tinged with yellow, especially in the females ; the transverse veins of the wings are oblique and sinuous.

P. TRANSVERSA, Fall.

This species closely resembles the preceding one ; it differs from it, however, in having the alulets smaller, the scales being only slightly unequal, and in having the external transverse veins of the wings nearly straight and upright ; the femora and tibiæ are all yellow in both species. These two flies, which are quite distinct, have been mixed together. Meigen, in his description of *P. Winthemi*, says, that the external transverse veins are straight and upright, but Schiner states that he had examined specimens obtained from Meigen, which all had the veins sinuous ; he, however, thought that there was only one species, and that Fallen's *P. transversa* was the same as Meigen's *P. Winthemi*. Rondani also confounded the two species : his description of the male of *P. transversa* (he does not mention *P. Winthemi*) applying to that species, while that of the female belongs to *P. Winthemi* ; for he says of the former, "vena transversa exteriore non rectissima," while he remarks of the latter sex, "alæ vena transversa exteriore distincte sinuosa." Both these species are rare, but I possess two males and two females of each.

P. LATITARSIS, Zett.

I have not seen a male of this species, which closely resembles that of *P. transversa*. The females may be known at once by their having the tarsi of the four posterior legs widely dilated at their extremities. I have two specimens, both captured in Yorkshire.

P. BICOLOR, Wdm.

This common species may be considered as the typical one of the group to which it belongs (those with small alulets). I will, therefore, briefly mention its leading features of distinction, so that it may be easy to note the characteristic points by which the following and nearly allied species may be distinguished from it. The forehead and face are somewhat prominent ; the eyes of the male sub-contiguous ; the seta bare ; the antennæ usually with all three joints black, but sometimes with the first and second rufous ; the palpi always entirely yellow ; the frontal stripe usually black in the females, and always in the males ; the abdomen of males sub-cylindrical ; all the tarsi and the fore femora black in the males, the tarsi only black in the females. The larvæ of this species feed on the leaves of several of the common species of dock (*Rumex*), in which they make large blotches.

P. NIGRITARSIS, Zett.

Rondani places this species in his genus *Anthomyia*, but in numerous examples which I have examined I have always found the scales of the alulets very small and equal in size. This closely resembles *P. bicolor* in shape, colour, &c., but differs in being usually rather smaller; in having black tips to the palpi; the eyes of the male contiguous; the frontal space mostly red in the males, and always brightly so in the females; and the fore femora always grey on their upper surfaces in the females. Schiner evidently confounds this species with *A. fulgens* of Meigen, but the latter (of which I have not seen a British specimen) has the scutellum yellow, not grey, as in *P. nigratarsis*. This fly also feeds in the larva state upon dock leaves; I have bred many specimens from those of *Rumex obtusifolius*. On one occasion, several individuals of this species, as well as some of *P. bicolor*, emerged from pupæ formed in the same leaf.

P. EXILIS, Meig.

This closely resembles the two preceding species, but differs from them both by having the palpi entirely black; the antennæ have the basal joints yellow. Rare: I bred a single specimen last year from a leaf of *Heracleum sphondylium*.

P. VERSICOLOR, Meig.

In shape and general appearance this species closely resembles *P. bicolor*, but may be distinguished from it by having the palpi entirely black; the antennæ are also black, by which it may be known from *P. exilis*. Not very uncommon.

P. FLAVIPES, Fall.

This little fly differs from *P. bicolor*, as well as from most of the other preceding species, by having the forehead flat, and the abdomen thin and depressed, instead of being sub-cylindrical. It has the arista pubescent; the palpi yellow (sometimes darkened at the extremities); the thorax sub-testaceous; the abdomen livid, with large sub-anal processes; and the four posterior femora with black rings round their extremities. Rare: only the male has been described.

P. VITTIGERA, Zett.

This species differs from all the preceding by having the thorax always pale, as well as the abdomen. The colour of the former varies from light yellow to rufo-testaceous, and it is marked down the dorsum with a broad grey stripe. This fly closely resembles *P. flavipes* in most points, having among others the posterior femora annulated with black at their extremities. Zetterstedt captured a female in union with a male of *P. flavipes*, and I am inclined to think that they are both varieties of the same insect. Rare: I captured a single female at Windermere in June, 1874.

P. ROTUNDICORNIS, Zett.

This is an aberrant species, peculiar by having the eyes of the male, as well as those of the female, separated by a considerable interval. The antennæ are short, with the third joint orbicular, and with the seta elongated and bare; the thorax is

grey; the abdomen very narrow, depressed, and reddish-brown. Zetterstedt only knew the male; the female is very similar to it, but has the abdomen fusiform and the metatarsi yellow. A pair of this well marked and peculiar species were sent to me for identification by Mr. Dale, of Glanville Wootton in May, 1877.

(To be continued).

REPLY TO MR. MEYRICK'S OBSERVATIONS ON THE SYNONYMY OF CERTAIN MICRO-LEPIDOPTERA.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

It is a truth which none will question, that no criticism of a man's work (however severe or unmerited) is so distressing as the ignoring of it altogether; and the distress, such as it is, is still more diminished when the critic bases his observations upon an unsound foundation.

When a man can say, as Mr. Meyrick cannot, that he has before him, as he writes, *the types*, or even *good figures*, of several so-called species, referred by their authors to different genera; and, that they are specifically identical, his statements may be accepted, until proved to be erroneous; but when he makes such sweeping statements as that respecting *Rhodaria robina*, it may safely be concluded that he will commit many errors through haste which he will afterwards regret: I will not then repeat this error by asserting that *R. robina* is not one or both of Guenée's species referred to *Endotricha*, since I have neither of that author's types before me, but I will positively maintain that it is neither generically nor specifically identical with any *Endotricha* known to me, nor with the *Pyralis stilbealis* and *P. docilisalis*, of Walker; I will further observe that I do not believe the last two to be varieties of the same species; although on this point I am open to conviction if Mr. Meyrick can show me a series of examples linking them together: on the other hand, Walker's species are referable to his genus *Doththa*, which appears to be congeneric with *Endotricha* (*E. flammealis*); and, therefore, on this head, as in *all but one* of my notes on synonymy, I am able to agree with Mr. Meyrick: whether he is right in stating that *Rhodaria*, Guen., is not separable from *Botys* will depend entirely upon what he regards as the type of the latter genus, a point which, at present, I have not the time to enter into.

I admit that I was over-hasty (in my paper in the *Annals*) in con-

demning Walker's *Crambus impletellus*, coming from Tasmania, whilst *C. pleniferellus* is from Sydney, I ought to have believed its slight differences of pattern (or, rather, the additions in the pattern of the primaries) to be constant until the reverse had been proved.

With regard to *Conchylis*? *auriceps*, which Mr. Meyrick asserts to be allied to *Philobota Arabella*, and concerning the neurulation of which he can speak confidently without examination, I may say that I have just examined it again in conjunction with *P. Arabella*, and that differences in neurulation (such as the distance between the emission of the subcostal branches and the direction and angulation of the discocellulars) do exist between them, and that the "other respects" which I put first (such as the form of wing and fringing) are similar to those of *Conchylis margaritana*, and not *P. Arabella*; nevertheless, our specimen being (as I stated in my description) an imperfect one, I may repeat the words there used:—"I cannot be positive of the correctness of its generic location."

Of *C. Thetis* it is possible that the collector may have sent Mr. Meyrick examples, but it is just as likely (in the case of a type of coloration frequent in the *Micro-Lepidoptera*) that either he, or even Meyrick himself, may have failed to recognise my species, in which case the synonymy will not be burdened; whereas, if the contrary be the truth, it will argue that my descriptions are easier to recognise than those of my critic, for I certainly went through his papers with each Melbourne specimen before I decided it to be new, and that, too, with an effort to obtain an identification if possible, which would have gratified the author had he seen it.

British Museum: May, 1883.

Influence of colour on Insects.—The following extract from the recently published 2nd part of vol. i of "Timehri," the Journal of the Royal Agricultural and Commercial Society of British Guiana, so ably edited by Mr. E. F. im Thurn, may be of interest to our readers. It occurs in an account of a visit to Mount Russell in Guiana, by the editor (p. 223):—

"That afternoon the Indians of the place, seeing our interest in catching butterflies, exhibited various clever ways of entrapping these insects. To catch those of yellow hue, they picked and laid on the ground the flowers of a yellow *Bignonia* (*B. chicka*); and this proved a most successful plan. Equally successful were they when they laid decaying banana-skins on the ground to attract the large blue *Morphos*; but an attempt to attract certain red species by displaying the ripe red

fruit of the faroah plant (*Bixa orellana*) was not successful. Then, these methods of enticing the insects were completed by inverting a round quake (a wide-mouthed basket of very open wicker-work) over the bait, taking care to raise the quake so that its lower edge was some inches from the ground. The butterflies, attracted by the flowers, made their way under the raised edge of the quake, and when the Indians approached flew, not out under the edge of the quake, but upward into the top, where they were captured."—E. C. R.

Notes on British Ants.—Ernest André, in his *Spécies des Hyménoptères Formicides*, pp. 271, 272, exposes an error into which entomologists have fallen with respect to the supposed males of *Stenamma Westwoodi* and *Asemorhoptrum lippula*, and clearly shows that at present the ♂ of one species only has actually been described; for my share in this blunder, I must apologize, as I described the ♂ of *Asemorhoptrum* from nature, but borrowed my characters of *Stenamma* from Smith, Mayr, &c., and did not see the actual type, as I ought to have, which would probably have saved me from the error.

Westwood originally described *Stenamma Westwoodi*, Stephens, MSS., from the ♂, not knowing any other sex; to this ♂, the ♀ and ♂ of a quite distinct species have been associated, so that what we have known, and F. Smith and myself have described, as *Stenamma Westwoodi*, has been the ♂ of one species, and the ♀ and ♂ of another. The ♂ of what we have called *Asemorhoptrum lippula* exists in several collections, and it now turns out, from Mons. André's examination, that these two males are identical. As Westwood described his *Stenamma Westwoodi* before Nylander characterized his *Myrmica lippula*, what we now know as *lippula* will have to be called *Stenamma Westwoodi*, and the ♀ and ♂ of what we have called *S. Westwoodi* will have to be known as *Formicoxenus nitidulus*, Nyl., the ♂ of this latter being as yet undescribed, the synonymy standing thus:

Stenamma Westwoodi, West.

= *Stenamma Westwoodi*, F. Smith, E. Saund., &c., ♂ (*nec* ♀, ♂).

= *Asemorhoptrum lippula*, F. Smith, E. Saund., et auct., ♂, ♀, ♂.

Formicoxenus nitidulus, Nyl.

= *Stenamma Westwoodi*, Smith, E. Saund. (*excl.* ♂), *nec* West.

While on the subject of British ants, I want to say a few words on the Bournemouth ant, which I have referred to *Formica gagates*, and for which Mr. Farren White, in his recent book, "Ants and their ways," has proposed the name "*glabra*."

I think there is no doubt that Forel and Emery are right in uniting *fusca*, *cinerea*, *cunicularia*, and *gagates* as races under the one species, *fusca*, Linn. Of these four races, *fusca*, *cinerea*, and *cunicularia*, have the abdomen clothed with silken hairs, *gagates* has it glabrous with stiff bristles round the apex of the segments; the specimen I have described from has the abdomen glabrous as in *gagates* true, but is undoubtedly smaller and paler than continental specimens. On the continent there are also intermediate forms, known as *fusco-gagates*, *fusco-cinerea*, *cinereo-rufibarbis*, and *fusco-rufibarbis*. Surely, it is more likely that our specimens belong to some such intermediate form (possibly, *cuniculario-gagates*, if there is such a thing), than to a new species "*glabra*," not known on the continent at all, especially as my specimen only differs from typical *gagates* in being smaller and paler, and because

paler, having the bristles at the apex of the segments less conspicuous. I should be only too pleased to add a new ant to our list, *i. e.*, if indigenous and not introduced directly by unnatural means, but I really think a form in the midst of the confusion of *gagates*, *cunicularia*, *fusca*, &c., should not be singled out for that purpose.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: *8th May*, 1883.

On the habits of the larva of Eupæcilia rupicola.—I have found these larvæ commonly, wherever *Eupatorium cannabinum* grows, *not*, however, in the standing stems of last year's plants, but in old broken and rotten bits, lying prostrate on the ground and covered over with moss and rubbish.

If the old stems happen to have been broken, or mown off, within three or four inches of the ground, there is pretty certain to be a larva spun up in a long cocoon, fastened to the outer wall of the stem, much in the same way as that of *E. udana* is, or else among the half-eaten pith.

Whether the larva at first feeds in the flowers and descends to make up in the rubbish I cannot say, but certainly the pith of the old stems is eaten. Sometimes two or three larvæ may be found, one behind the other, in a very narrow stalk just large enough to hold them. These larvæ are bright yellowish-pink on the back, paler beneath. Very sluggish, and if disturbed, not wandering away as the larva of *udana* does, but contentedly spinning themselves up again in the old spot. Unfortunately they are terribly subject to ichneumons, which are already beginning to appear. I have not found a single larva in a standing stem of last season.—W. WARREN, Merton Cottage, Cambridge: *April 20th*, 1883.

On the hibernation as full-fed larvæ of some species of Nepticula.—Dr. Wocke has remarked in the Stettin. ent. Zeit., 1871, p. 428, that the larvæ of *Nepticula sericopeza* may be found spinning their cocoons on maple-trunks in spring, and it seems probable that others may have the same habit, ignorance of which is possibly the cause of failure or difficulty in breeding these species. Last autumn I placed a few pear-leaves, with larvæ of *N. minusculella* in their mines, within a glass vessel half-full of earth and rubbish. The top was covered over with a piece of white muslin. I took particular care of these insects, because, though I had bred them easily from the summer brood, I had always failed with the winter one.

Well, I examined the vessel carefully last autumn, and also at times during the winter, without seeing any trace of cocoon or larva in the earth through the glass. Last week, on putting the vessel along with others containing *Nepticulæ* in the recess of a window, exposed to the sunshine, I was startled to find a fresh yellow cocoon attached to the muslin at the top of the glass. Now, as I have had the covering off many times during the winter, and examined it each time, the cocoon must have certainly been newly spun, so that I cannot help thinking that the larva of *minusculella* hibernates in the ground and spins up only in spring.

In confirmation of this supposition I may mention that, three years ago, I had collected a large number of larvæ of *Nepticula atricollis*, some of which were kept in an ordinary flower-pot half-full of earth, and others in a tin without earth. In the summer following, I bred large numbers of the imago from the flower-pot, but failed to find within the earth the slightest trace of a cocoon; while from the tin I

bred a few, but these were always sitting *outside* on the rim of the tin, or on objects near, and I remember being puzzled at the time to account for their getting out in this way. Here, too, I found no trace of any cocoon *within* the tin among the leaves. I now fancy that the cocoons must have been spun in spring at the top or outside, where, of course, I never thought of looking for them.

If I am right in this conjecture, it is probable that a large number of *Nepticula* larvæ escape from us in spring-time, and spin up at large; for we never think of looking to see if our vessels are tightly closed at *this* time, and our failures may be due to this and not to the death or drying up of the insects.

In the case of *sericopeza*, the larvæ may either remain in the fallen keys during the winter, or emerging therefrom may hibernate in the ground, ascending in spring to spin their cocoons.—ID.

The young larvæ of Coleophora lixella.—Whilst gathering blades of grass containing larvæ of *Elachista stabilella*, I observed a plant of *Dactylis glomerata*, with two white patches, on which were two brown specks. On closer examination, these proved to be each a dry calyx of thyme, and the young larvæ were still feeding within them on the grass-blades, ejecting their "frass" from the end. Though the fact of *Coleophora lixella* feeding at first on thyme has long been known, I am not sure whether this particular habit of the larvæ, after hibernation, feeding in spring *within the old flowers* has been recorded.—ID.

[It being news to me that the young larvæ of *C. lixella* continued to use their thyme-cases whilst actually feeding on the grass, I wrote to Mr. Warren for further details on this point, to which he replied, May 9th, as follows:—"You were quite right in thinking that the young larvæ of *C. lixella*, while still in their thyme-cases, fed on the grass; but on the 30th April, I found that one had left the old case and cut a piece out of the side of a blade of grass, with which it has fashioned a new case, still quite small, and the other has since done likewise." This reminds me that, when, in 1854, I was staying at Box Hill from the 14th to 17th April, I found far more grass leaves mined by the larvæ of *C. lixella* than I could find cases of the larvæ; at that time I was only acquainted with the grass-made cases, and, therefore, looked only for them, had I then known of the thyme-calyx cases and looked for them, I should probably have had a more successful hunt. I remember that I came to the conclusion that the larva of *Coleophora lixella*, unlike its congeners, had a habit of wandering far from the leaves on which it had fed. Now, after an interval of 29 years, with additional information, the matter appears in a different light.—H. T. S.]

Coleoptera from the vicinity of ants' nests, Chobham.—Whit Monday being a warm, more or less rainy, day at Chobham, I established myself under some trees growing on a bank on Chobham common, and hunted for *Coleoptera* under dead leaves, &c., at the base of the bank, I soon found that there were two ants' nests in the vicinity: one of *fuliginosa*, and another of *rufa*; *rufa* seemed to hold entire possession of one part of the bank, *fuliginosa* of the other, on one occasion I saw one of each species meet, and *fuliginosa* had to succumb to the strength of *rufa*.

In the *rufa* quarters I only found *Myrmedonia humeralis* and *Drusilla canaliculata*, but with *fuliginosa* I found these two species equally commonly as with *rufa*, and also *Myrmedonia limbata*, *lugens*, *laticollis*, and *funesta*, as well as a single specimen of *Amphotis marginata* adhering to the base of the stem of a foxglove, and covered by the leaf that sheathed it. I further took a single specimen of *Callicerus rigidicornis*, and several of the little wood-louse, *Platyarthrus Hoffmanseggii*, from roots of grass. Two of our rarer ants occurred in the same locality, viz., *Stenamma Westwoodi* (*Asemorhoptrum*, olim.) and *Leptothorax Nylanderi*, but I do not think either of these were associated with the other species of *Formica*. All these were taken within twenty yards of the same spot, and, as I doubt if it has often fallen to the lot of one person to take six species of *Myrmedonia* in one day, I thought a record of their capture might be of interest.—EDWARD SAUNDERS: Holmesdale, Upper Tooting: 18th May, 1883.

Recent captures of Coleoptera and Hemiptera in the Birmingham district.—Owing to the bad state of the weather during the first four months of the present year, outdoor entomologizing has not been either so pleasant or so profitable as could have been desired; but, nevertheless, I have taken a few good things, and have added several species of insects to our local lists. Amongst my best finds are the following:—

COLEOPTERA: *Bembidium prasinum*, *Hydroporus lepidus*, *Tachyusa atra*, *Orypoda nigrina*, *Myllæna intermedia*, *Gymnusa brevicollis*, *Geodromicus nigrata*, *Acidota cruentata*, *Coryphium angusticolle*, *Euplectus punctatus*, *E. bicolor* (in abundance under bark of dead oak trees), *Scydmaenus exilis*, *Cephennium thoracicum*, *Ptilium Kunzei*, *Pt. Spencei* (both in hot beds), *Myrmex piceus*, *Cryptarcha strigata*, *C. imperialis*, *Rhizophagus depressus*, *R. ferrugineus*, *R. perforatus*, *R. parallelocolis*, *R. nitidulus*, *R. politus*, *Aphodius porcus*, *Salpingus castaneus*, *Apoderus coryli*, *Xylocleptes bispinus* (in plenty by beating *Clematis vitalba*, May 15th), *Platyrhinus latirostris* (on ash log), *Donacia comari*, *Gonioctena pallida* (one by beating, May 15th), *Endomychus coccineus* (abundant amongst moss on an old stump).

HEMIPTERA: *Serenthia læta*, *Acalypta brunnea* (also in the young state, amongst moss on oak trees), *Aradus depressus* (flying in the sunshine), *Xylocoris ater*, *Salda c-album*, *S. Cocksii*, *Hebrus pusillus*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: May 16th, 1883.

A new British Trichopteron (Mesophylax aspersus, Ramb., var.).—While examining a small collection of caddis-flies formed by Mr. Service, of Dumfries, one specimen (a ♂) gave me considerable trouble, as it did not agree in certain details with any of the species described in Mr. McLachlan's "Monographic Revision and Synopsis of the Trichoptera." I submitted the specimen to Mr. McLachlan, who at once informed me that it was *Mesophylax aspersus*, Ramb., variety.

The species has been recorded from the south of Europe, while the variety has been taken at the Lake of Zürich in May and September. Unfortunately, Mr. Service cannot give any date or exact locality where his specimen was captured, but he says that all the insects in the collection were taken within Torquair parish, Dumfriesshire, he having only collected caddis flies in three localities, so I hope he may

be able to turn up the insect again this year. With his usual kindness he has placed the specimen in my cabinet.—JAMES J. KING, 207, Sauchiehall Street, Glasgow : 17th May, 1883.

[*Mesophylax aspersus*, Rbr., stands in my Monographic Revision and Synopsis as *Stenophylax aspersus*, p. 132, and Supplement, pp. x and xxxiv. The genus *Mesophylax* was created by me subsequently (Journ. Linn. Soc., Zoology, xvi, p. 156, 1882) for the reception of *S. aspersus* and *S. oblitus*, on account of the microscopic condition of the spur of the anterior tibiæ of the ♂, without the first joint of the anterior tarsi being abbreviated, &c. The type form belongs essentially to the South of Europe, and is often found in caves; the paler var. (?) has been recorded from as far north as Bavaria. Whether I am right or not in considering this pale form only a variety remains to be proved; it is usually larger than the type form, but Mr. Service's example is of about the ordinary size. *M. aspersus* is an insect I should not have suspected of occurring in Britain, and especially in Scotland. Most of the allied species of *Stenophylax* and *Micropterna* are very concealed in their habits. There is just a possibility that this example may have worked its way inland from some vessel passing along the Scottish coast, but the chances of its having done so seem infinitesimal. I hope Mr. Service will search for the species diligently, and be enabled to place the matter above all doubt by further discoveries.—R. McLACHLAN.]

Reviews.

ROVÁRÁSZATI LAPOK. We have received what appears to be No. 4 (April, 1883) of a new monthly Entomological Magazine in the Hungarian language, and published at Pesth: we have copied the title. The contents seem to be varied, and probably of great value scientifically, and evidently concern several Orders of insects, according to the scientific names. More than this we cannot say. Beyond these scientific names, the only intelligible matter (to us) is a scale of charges for advertisements (in German) on the cover, and the titles of publications noticed. The editor (according to the signature to the scale) is "Dr. E. Kaufmann," of Szaboles, near Fünfkirchen, Hungary. In another cover-notice (in Hungarian) he appears as "Dr. Kaufmann Ernő," the latter word being evidently the Christian name; we have not the slightest doubt but that the cart thus put before the horse will retain its anomalous position in catalogues and records. If the editor wishes his magazine to be known outside Hungary (and we presume he has this desire, or he would not have sent us the last No.), he should give a résumé of (at least) the contents in some language with which most scientific men are familiar; in that case it would be possible for those who do not understand the Magyar language to obtain a translation of any article that seemed of sufficient interest. Patriotism we look upon as one of the finest attributes of human nature; but Science knows no nationality; therefore, if the notes in the Magazine whose title we give at the head of this notice are of any value outside Hungary (and, no doubt, most of them are so), the editor should not conceal their value by giving no clue to it in a form available to the majority of scientific students.

CATALOGUE OF BRITISH COLEOPTERA, by DAVID SHARP, M.B., &c., 2nd edition. London: E. W. JANSON, 35, Little Russell Street; March, 1883. 39 pp. 8vo.

Dr. Sharp is so justly accepted as an authority among Colcopterists, both in this country and abroad, and his catalogue has been so long in use, and of such service to British students, that it is not necessary for us to say much in its favour, but we may remark that this 2nd edition is in every respect equal to the first, and is of a rather smaller and more convenient form.

There is only one important change made in the arrangement of the families, viz., the removal of the *Erotylidae*, *Endomychidae*, and *Coccinellidae* from the end of the arrangement to a situation between the *Lathridiidae* and *Mycetophagidae*. Among the genera the changes are more numerous, especially in the *Dytiscidae* and *Staphylinidae*; these families are well known to be favourites of the author, and we think all will acknowledge that the new genera represent very natural groups of species. The alterations in the sequence of the genera at the commencement of the *Staphylinidae*, the separation of *Drusilla* from *Myrmedonia*, and of *Gnypeta*, *Epipeda*, and *Brachyda* from *Homalota*, seem to us to be most desirable, and the positions assigned to them natural and satisfactory; to adopt all Thomson's divisions of *Homalota* would be perplexing, but we regard these three as well selected, as no one could have considered their representatives as belonging naturally to *Homalota*, notwithstanding the comprehensive nature of that wonderful genus. On the whole, we may say that as few changes as possible seem to have been made in the catalogue, but what have been made, we think, are necessary. In specific names, a great many changes occur in the family *Chrysomelidae*, and notably in *Donacia*, where "priority" has necessitated the abandonment of many well-known names, still we fully admit the necessity of this rule, although its application often causes considerable temporary inconvenience.

There are two small matters we do not like in the catalogue: one is the omission of capitals to names of persons in connection with specific names; the other, and more serious, is the omission of the authors' names to the genera; but these are of small importance where all else is so well and satisfactorily done.

Obituary.

William Alexander Forbes, B.A., F.L.S., died at Shonga on the Upper Niger, on January 14th, at the early age of 28, a victim to his enthusiasm in the cause of Natural History. He was the second son of Mr. J. S. Forbes, the well-known railway director, and was born at Cheltenham on June 24th, 1855; he was educated chiefly at Winchester, and entered St. John's College, Cambridge, as an undergraduate in 1876, where he took high honours in natural science. Forbes was a born naturalist, and for many years devoted himself to entomology with much ardour. During his residence at Cambridge he took a prominent part in resuscitating the entomological society of that university town, and organized a regular series of excursions in connection with it during the season. Moreover, he made many excursions in the Alps in search of insects, an account of some of which will be found in the volumes of this magazine. Perhaps natural predilection for anatomical studies, combined with the magnitude of the subject of entomology, gradually turned his attention

chiefly to comparative anatomy, especially that of birds, a subject on which he had already made his mark in connection with the prosectorship of the Zoological Society, to which post he was appointed after the premature decease of his friend Prof. Garrod. His vacations were always devoted to zoological expeditions; in 1880 he paid a visit to Brazil, in 1881 to the United States. The more extended visit to the Niger was commenced in July, 1882, with the melancholy result we all deplore; that malarious region soon made of him another martyr to the cause of science. All who watched his career saw in him one who was destined, if he lived, to make a great name for himself, and his exceedingly amiable disposition causes his premature death to be lamented by hosts of private friends.

ENTOMOLOGICAL SOCIETY OF LONDON: 4th April, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

L. Hill, Esq., of Ealing, and L. Peringuey, Esq., of Cape Town, were elected Members.

The President, in announcing the death of Prof. Zeller, gave a brief sketch of the career of the late illustrious Honorary Member of the Society.

Mr. W. F. Kirby exhibited specimens of an *Aceridium* (believed to be *A. succinctum*, L.), which was stated to be causing great devastation in India.

As an item of "economic entomology," Prof. Westwood stated that the Myriopod *Polydesmus complanatus*, L., had been gravely accused in a Sussex newspaper of being the cause of the potato disease.

The Rev. A. E. Eaton exhibited a revolving "holder," which he had found of great service in microscopic manipulation.

Mr. Fitch exhibited galls of *Cecidomyia violæ*, Löw, found by Mr. Corder on *Viola sylvatica* in Epping Forest; also an *Aphis* gall on *Pistacia* from Cannes; and a curious pouch-like gall of a *Cecidomyia* on Juniper, found at Mentone, by Mr. Thomas Boyd.

Sir S. S. Saunders read further communications respecting fig-insects.

Mr. H. Goss exhibited *Pimelia angulata*, F., from the Egyptian Pyramids.

Mr. Olliff read a paper on new species of Clavicorn *Coleoptera* from North Borneo, collected by Mr. W. B. Pryer.

Mr. Cameron communicated descriptions of new genera and species of *Hymenoptera*, chiefly exotic.

Mr. Kirby read notes on new, &c., *Hymenoptera* from New Zealand.

2nd May, 1883.—The President in the Chair.

This being the 50th anniversary of the foundation of the Society, the President read an historical sketch, in which he succinctly embodied all points of interest concerning its career, and the benefits it had conferred upon entomological science in general. Only six of the original Members still survive, viz.: Prof. C. C. Babington, the Rev. L. Blomefield, Sir S. S. Saunders, Mr. W. B. Spence, Mr. G. R. Waterhouse, and Prof. Westwood. He expressed a hope that the number of Members would be very largely increased before the end of the jubilee year.* In concluding his address, he suggested that Prof. Westwood be elected titular Life-

* A hope we most cordially share.—EDS.

President of the Society, accompanying his suggestion by eulogistic remarks on the career of our veteran entomologist, and his labours in the cause of entomology. This was adopted by acclamation.

The Meeting was then made "special," in order to consider certain proposed alterations in the bye-laws. Some of the propositions were adopted, others rejected. The chief resultant alterations were as follows:—No "Subscribers" will be henceforth elected: the "Transactions" will be sent without further payment to all Members not in arrear with their subscriptions: notice is to be given of names proposed to be substituted for those recommended for officers and council before the Annual Meeting, such proposed substitutions (if any) to be notified by circular to the Members. At the ordinary Meeting, E. A. Butler, Esq., of Hastings, and W. H. Miles, Esq., of Lambeth, were elected Members.

SOME NEW SPECIES AND GENERA OF *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

While investigating a small batch of New Zealand *Coleoptera* received recently from Mr. Helms, of Greymouth, I have found the following new forms that it appeared to me advisable to describe.

Tarastethus, *n. g.* of *Carabidæ*; *T. puncticollis* and *T. læviventris*, *nn. spp.*; *Lecanomerus marginatus*, *n. sp.*; *Pterostichus Helmsi*, *n. sp.*; *Protoparnus*, *n. g.* of *Parnidæ*; *P. vestitus*, *n. sp.*; *Clypeorhynchus* and *Saphorhynchus*, *n. g.* of *Curculionidæ*; *C. gracilipes* and *S. longicornis*, *nn. spp.*; *Dorytomus elegans*, *n. sp.*; *Eugnomus argutus*, *n. sp.*; and *Tychanus bufo*, *n. sp.*

TARASTETHIUS, *n. g.*

Form short and convex, surface glabrous. Mesothoracic epimera linear, not reaching the coxæ. Head with two ocular setæ on each side; scrobe with an exserted seta in front. Metasternum excessively short, so that the middle coxæ almost touch the hind ones. Antennæ with the three basal joints glabrous, the others pubescent, but not densely so, so that there is not a very abrupt contrast between the glabrous and the pubescent joints. Elytra not at all truncate, with a slight sinuation near the extremity. Last joint of maxillary palpus longer and rather stouter than the preceding joint, narrowed towards the extremity and acuminate. Second joint of labial palpi short and stout, minutely bisetose, mentum with large acute tooth in the middle. Male anterior tarsi with the two basal joints a little dilated, their inner angles a little produced and acute, squamæ very obscure. Pro-

thorax with a single lateral seta on the side at the middle, and a minute one at the hind angle, none in front; base truncate, reposing on the base of the elytra, which possesses a well-marked margin.

This genus of small *Carabidæ* is allied to *Cyclothorax*, from which it differs by the convex form, the remarkably abbreviate metasternum, and by the structure of the male tarsi; the condition of these feet I am not, however, able to ascertain very thoroughly.

TARASTETHUS PUNCTICOLLIS, *n. sp.*

Nigro-piceus, nitidus, antennis palpis pedibusque testaceis; prothorace lateribus sinuatis, basi truncato, utrinque impresso, et crebre punctato, angulis posterioribus fere rectis; elytris profunde striatis, striis fortiter punctatis, interstitiis parum convexis levigatis: abdomine utrinque fortiter punctato.

Long. 5 mm.

Thorax narrower than the elytra, about as long as broad, with an elongate channel along the middle, with an impression at the base on each side nearly equidistant from the middle and the outer margin, the whole of the base punctate, the disc nearly impunctate. Elytra short and broad, convex, the shoulders much curved, the eighth interstee elevated at the extremity so as to form a plica.

I received a specimen found at Greymouth formerly from Herr Reitter, and have now received the insect from Mr. Helms. I have not, however, seen the male.

TARASTETHUS LÆVIVENTRIS, *n. sp.*

Nigro-piceus, nitidus, antennis palpis pedibusque testaceis; prothorace lateribus sinuatis, basi truncato, utrinque bi-impresso, fere levigato; elytris interne striatis, striis remote punctatis; abdomine levigato.

Long. 5 mm.

This species differs from *T. puncticollis* in numerous respects; the thorax is less sinuate at the sides, and is almost without punctuation, there being only about four or five punctures on each side about the middle of the base; the basal impression is differently formed, so that, viewed in a certain manner, there appears to be a second impression near the outer margin; the outer striæ of the elytra are quite obsolete, but the eighth interstee forms an elevated plica at the extremity.

It is from this insect that my description of the male tarsus in the generic description is taken; one of the front legs, however, being gone, I am not very sure about the details: there is no seta in this species at the hind angle of the thorax. Also sent by Mr. Helms from Greymouth.

LECANOMERUS MARGINATUS, *n. sp.*

Ovatus, nigricans, palpis, pedibus elytrorumque margine externo testaceis, antennis, tibiæ apice tarsisque fuscis, illis basi testaceo; corpore subtus variegato: prothorace transverso, posterius angustato, basi lævigato vix impresso; elytris sat profunde striatis, striis haud punctatis. Long. 6 mm.

This species is distinguished from the other New Zealand *Lecanomeri* by the more variegate surface, in which respect it resembles the New Caledonian *Acupalpus domesticus* (a species which should also be referred to the genus *Lecanomerus*). The antennæ are rather stout, and the basal joint clear yellow; the raised margin of the prothorax is yellowish, as is also the scutellum, and the same colour forms a broad definite border of variable width along the sides of the elytra; on the under-surface the head and the hind coxæ are yellow, and the ventral segments are maculate at the sides. The dilatation of the male tarsi is moderate, the fourth joint being not very short and broad.

This species occurs at Auckland, where it has been found by Messrs. Broun and Lawson: it is probable that Captain Broun's record of the occurrence of *L. latimanus* at Tairua and Whangharei refers rather to this species; Mr. Bates having at first supposed the *L. marginatus* to be a variety of *L. latimanus*, so named specimens, and thus the error has arisen.

PTEROSTICHUS HELMSI, *n. sp.* (sub-gen. STEROPUS).

Elongatus, niger, superne plus minusve metallico-tinctus; prothorace elongato, posterius angustato, mox ante angulos posteriores sinuato, his rectis, basi utrinque fovea magna, impunctata, impressa; elytris ad apicem acuminatis, lateribus curvatis haud parallelis, profunde striatis, striis haud perspicue punctatis, interstitiis absque punctis impressis, ad apicem leviter transversim depressis itaque subundulatis apparent.

Long. 18, lat. $6\frac{1}{2}$ —7 mm.

Var. *femoribus rufis.*

This is, so I am informed by Mr. Helms, the only Carabideous insect of considerable size that is at all common near Greymouth; it is remarkable that it should not have been detected in other parts of the islands, especially as it belongs to a sub-genus not known before to occur in New Zealand; this sub-genus (*Steropus*) is recorded by Chaudoir (Bull. Mosc., 1865, p. 97), as possessing several species in Australia characterized by their elytra being acuminate at the extremity, and possessing some large punctures on the third interstice. *Pterostichus Helmsi* agrees in the former of these respects with the Australian *Steropi*, but has no punctures on the third interstice, so that it should apparently form a separate section in *Steropus*. From all other New Zealand *Pterostichi* of large or moderate size known to me, *P. Helmsi* is readily distinguished by its more slender form, and the more prolonged apical portion of the elytra. The undulated appearance on the posterior part of the wing-cases is somewhat variable, and the metallic tinting of the upper surface is very variable, and occasionally very slight.

PROTOPARNUS, *n. g.*

Allied to *Parnus*, but the body simply pubescent, without indument, the eyes quite small and coarsely faceted; the antennæ ten-jointed, the second joint not auriculate, joints 4–10 furnished with an elongate process: metasternum short.

The insect, for which I propose this generic name, agrees with the generic characters given for *Parnida* by Broun (Man. N. Zeal. *Coleoptera*, p. 249), except in the structure of the antennæ; but if Broun's description be at all correct, these organs must be very different in *Parnida* to what they are in *Protoparnus*. In this latter genus they are ten jointed, the basal joint is short and nearly triangular, the second joint is short and very broad, quite twice as broad as long, closely applied to the broad end of the basal joint; the third joint is very small, articulated by a very slender process to the posterior angle of the second joint; the fourth and following joints emit each in front a rather long process, so that the six penultimate joints form together a short, very broad mass, the terminal or tenth joint has a less extension in the transverse direction, so as to form an obtuse termination to the mass.

PROTOPARNUS VESTITUS, *n. sp.*

Piceus, sat nitidus, pube molli erecta vestitus, prothorace sat fortiter punctato, intra latera utrinque profunde impresso; elytris leviter striatis, striis internis obsoletis, externis sat profundis; antennis tarsisque rufis.

Long. 3 mm.

Thorax transverse, the sides in front rounded and narrowed, parallel to each a deep impression extending the whole length, but deeper at the base than in front. Scutellum broad, not pointed, impunctate. Striæ of the elytra distinct at the sides and apex, but obsolete towards the suture, some of them deeper at the base, and connected just before the base, so that some of the interstices, more particularly the 5th and 7th, reach quite to the base, while others do not. Legs short and stout. Terminal ventral segment without impression.

I have not received from Mr. Helms any information as to the habits of this little creature, but I do not suppose they are aquatic. Mr. Reitter has also received this from Mr. Helms.

CLYPEORHYNCHUS, *n. g.*

Rostrum not quite so long as prothorax, moderately stout, between quadrate and cylindric, antennæ inserted so as to leave one-third of the length of the rostrum in front of their insertion; the anterior portion of the rostrum separated by a deep irregular suture from the other part, and glabrous, the portion behind the suture being rugose

and clothed with scale-like hairs. Mandibles exposed at apex of rostrum, and laminate, that is, presenting externally and in front a well marked edge: scrobes deep in front, elongate, vague behind, not reaching the eye, this latter oval, contiguous with the margin of the thorax. Antennæ elongate and slender, scape elongate, clavate, extending backwards beyond the eye, 1st joint of funiculus very elongate, but not quite half so long as the scape, club elongate-oval, slender, evidently three-jointed, the three joints of about equal length. Thorax sub-oblong, narrower at the base than the elytra. Legs elongate, tarsi slender, third joint with elongate lobes.

This genus may be placed in the *Rhyarosomides* of Lacordaire, where, however, it is an anomalous form. Having somewhat the appearance of *Phrynixus*, Pascoe, it is abundantly distinct therefrom by the elongate scrobes, and by the slender third joint of the tarsi, which joint, moreover, is divided so deeply as to form two remarkably elongate lobes. It is an interesting fact, that although the scrobes are not terminal, yet they possess a very evident lateral dilatation after the manner of the *Rhynchides*. The remarkable differentiation of the anterior and posterior portions of the rostrum appears to me to indicate that even in the *Curculionidæ* with elongate rostrum, the portion in front of the antennal insertion is made up of the transformed clypeus, although frequently no trace of a division between the epicranium and clypeus can be detected.

CLYPEORHYNCHUS GRACILIPES, *n. sp.*

Convexus, fusco-ferrugineus, setulis haud densis maculatim vestitus, antennis pedibusque gracilibus, setulis erectis tenuibus minutis; prothorace elongato, anterieus impresso, posterius ruguloso.

Long., excl. rost., 6 mm.

Rostrum rugose, in front of the antennæ smooth and shining, the vertex between the eyes with an elongate impression. Thorax longer than broad, its greatest width in front of the middle, slightly narrowed behind, more distinctly narrowed in front, the upper surface rugose and limited on each side by an irregular band of dense sub-depressed pale setæ, and in the middle in front deeply impressed. Elytra oblong-oval, obliquely narrowed at the shoulder, the surface rather uneven, but without distinct prominences, rather vaguely striate, the striæ marked with irregular depressions, with irregular spots of pale squamiform setæ. Legs slender, all the tibiæ evidently sinuate internally, and with their inner angle prolonged and acuminate.

Mr. Helms has sent this species as No. 132, and informs me that it was found at Mouri Creek, about sixteen miles from Greymouth.

(To be concluded in our next).

STRAY NOTES ON THE *LEPIDOPTERA* OF PEMBROKESHIRE.

BY CHAS. G. BARRETT.

After such a year as I had never previously known—rain all through the spring until June, when one fortnight of fine weather intervened, then rain again till August, when came another fine fortnight, then rain, rain, rain, through September, October, and November, with only a fine day at rare intervals, and even more and continuously heavier rain through December, January, and the greater part of February, so that no drop of water seemed able to soak into the saturated earth, but all ran off as it fell, in rills, rivulets, and tumbling streams over all this hilly country—after all this, which should surely have washed, drowned, or mildewed all insect life out of existence, then came, at the end of February, such a burst of glorious sunshine as we had well-nigh despaired of ever seeing again, and promptly there appeared in the woods such a host of the lively little *Tortricodes hyemana* as I never saw before, not even in the South of England. It seemed almost magical, after a year of desolation, in which hardly a moth could be found in the woods, to see these swarms of lively little creatures dancing about in the sunshine. Clearly *this* species is able to hold its own against wet weather. Fortunately there was an added element of interest in the occurrence of this common species: among the numbers of males of the usual light brown colour were some in which the ground colour was creamy-white, and the markings dark brown, forming a very pretty and attractive variety, which, with the wings closed, looked wonderfully like *Acrobasis consociella*.

Almost the only other moth obtainable in the woods at the same time was *Hibernia leucophæaria*, which was tolerably common, sitting high up on the trunks of the trees, or among the dead leaves. Nearly all were of the ordinary grey type, and those with blackish fasciæ were not well marked, but I met with an exceedingly pretty variety, of a pale straw colour, without irrorations, and with the transverse lines dark brown.

Before these two species had disappeared, *Eupithecia dodonæata* came out commonly, though from its habit of sitting under the branches of oak trees, and flying higher up when dislodged, it was difficult to secure. Some of the specimens were very light coloured, and prettily marked.

In June, 1882, the pretty larva of *Ceropacha ridens* was tolerably frequent in the woods, the most convenient and successful method of

obtaining them being by looking up at the overhanging oak boughs, when the larvæ could easily be seen lying half curled under outside leaves drawn slightly together. From these a lovely and variable series of the moths emerged this spring. The larva of *Teniocampa miniosa* was common at the same time, but very many were destroyed while small by a parasite, which, on emergence from the larva, formed for itself a queer hard case, like a large caraway seed, and deeply ribbed, within which it made the usual silken cocoon. I suppose I kept these too dry, for no parasite emerged. Between the ravages of these enemies, and the unfortunate propensity of *Teniocampa* for dying in the pupa state, I lost nearly all my hoped-for *miniosa*.

Since the extraordinary invasion of these islands by vast swarms of *Plusia gamma* and *Cynthia cardui* from the continent in 1879, there has been in this district a marked scarcity of the former usually abundant species, and an almost total absence of the latter. I think I may safely say that I did not see a dozen *P. gamma* last year, and certainly not one *C. cardui*. It was, therefore, with no little interest that I noticed in the beginning of May this year, that the whole country had suddenly become lively with *P. gamma*, rising hastily every minute from the road-sides, and dashing wildly about the fields, and ten days later that they were joined by large numbers of *C. cardui*. It seemed curious to see half a dozen of the latter on a patch of *Allium ursinum*, enjoying the nectar of the flowers, entirely unconscious of—or, perhaps, approving—the peculiar fragrance of the plant.

In the case of *P. gamma*, it was noticeable that, although in tolerable condition, the specimens were certainly different in colour from those usually found in this district, being more of a slate colour, and paler beyond the middle of the fore-wings. In this they were very uniform. From this, as well as from their time of appearance in such numbers, I judge that they were not natives. All the *C. cardui* were also rather pale, being worn from evident hibernation, but as there were none here last autumn, nor any larvæ, they could not well have hibernated here. Moreover, on their first appearance, they were exceedingly wild and swift of flight, although it was a full fortnight earlier than they would have, in ordinary course, left their places of hibernation.

All the evidence, therefore, seems to point very strongly to an immigration from some warm climate of a swarm of both these species, just as in 1879. To reach us they must first have visited the south or south-west of England, and information on the subject from those districts would be very desirable. In 1879, *C. cardui* accomplished its

own extermination in a very singular manner. It seemed that its instinct—derived from a country of longer summers—tended towards the production of a second brood in the year, and eggs were laid which produced the young larvæ in October on the young thistles. These larvæ, of course, perished in the wet winter, and the species disappeared, to re-appear after this interval, in obedience to the strange migratory instinct. It is extremely difficult to get at data from which to judge of the cause of this system of irregular migration, but I think we have now a clue to the means by which species are locally destroyed.

Both species are still flying about in the sunshine in plenty. I must have seen scores of *cardui* to-day in the course of a short drive, and hope to see the roads rendered attractive by an abundance of the pretty creatures in far greater perfection at the end of July, if only this lovely weather remains faithful to us ; but I fear that, undeterred by the fate of their kindred, they will lay their eggs in the autumn, to no purpose.

Among the species able to endure a humid climate, *Melitæa Artemis* must certainly be included, though even it, no doubt, appreciates the value of warm sunshine at the time when its hibernated larvæ leave their sheltering tent to feed up in the spring.

I found the butterflies just emerging from the pupa in one of their favourite haunts at the end of May, in rather unusual numbers, and a week later, on a second visit, they were out in hundreds. When freshly out (on the first visit) they were very beautiful, some having a row of white spots along the margin of the hind-wings, and many emulating, though not equalling, the lovely dark markings of the West of Ireland specimens. One or two had a broad pale band across the fore-wings from the obliteration of a dark transverse line, and one of these had also the under-side of the hind-wings ornamented in a similar manner.

On the other hand, *Argynnis Selene* has disappeared from the road-sides, and the little strips of marsh into which it had found its way in recent years, and is only to be found in the woods and down the slopes of sea-cliffs. In the latter localities, a slight tendency to greater richness of marking leads one to hope for some handsome variety, which, as yet, has not turned up.

Such a hope led me the other evening down a charming place, a long slope covered with coarse grasses, furze, heath, wood-sage, violet, &c., running down to where the bare rock, sixty feet deep, was fringed with ivy, privet, wild madder, *Silene maritima*, thrift, and other sea-side plants. Here *Selene* was thoroughly at home, as completely

as in an inland wood, spreading its wings in the gleam of the setting sun, flitting away down to the edge of the precipice, or hanging with closed wings on the heads of the cock's-foot grass. The only other living creatures in sight were two or three pairs of herring-gulls flying about the rocks, and uttering loud cries of defiance at the intrusion.

At the top of this slope I met with one *Syrichthus alveolus*, almost the only specimen seen this year, though carefully searched for in the interests of a local museum. *Lycæna Argiolus*, formerly common here, has also apparently disappeared, a victim to the rain.

Pembroke: 11th June, 1883.

NOTES ON HAWAIIAN MICRO-LEPIDOPTERA.

BY E. MEYRICK.

I am indebted to the kindness of the Rev. T. Blackburn for the specimens on which the following notes are founded. I had the pleasure of making a rough general examination of Mr. Blackburn's collection, from which it appears that the Micro-Lepidopterous fauna of the Hawaiian Islands is highly specialized and very interesting. So far as I could determine, Mr. Butler's identifications of those species described by him are often erroneous; a few of these I have here corrected. The importance of a thorough investigation of this fauna is very great, as bearing on questions of geographical distribution and development.

CONCHYLIDÆ.

HETEROCROSSA, Meyr.

H. achroana, n. sp.

♂ ♀. 18—20 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish; palpi very long in both sexes, externally mixed with dark fuscous towards base; anterior tibiæ mixed with dark fuscous. Fore-wings elongate, costa moderately arched, apex round-pointed, hind margin straight, moderately oblique; whitish, thinly sprinkled with greyish-ochreous and fuscous, appearing ochreous-whitish; a tuft of raised scales on fold at one-third from base, and two others transversely placed in disc beyond middle; a few scattered raised scales: cilia whitish, sprinkled with fuscous. Hind-wings and cilia whitish.

Distinguished from all the other species of the genus by the entire absence of dark markings. Two specimens taken on Mauna Loa, at an altitude of 4000 feet.

The occurrence of this genus is very interesting. I have described two species from New Zealand, and a third from Australia, and have two other New Zealand species undescribed. It belongs to a very ancient group of the *Conchylidæ*, now in course of extinction, and represented in Europe only by the two species of *Carposina*, H.-S. This genus is specially characterized in the group by the basal pectination of the lower median vein of the hind-wings, a structure otherwise confined to the *Grapholithidæ*, and probably ancestral. The species is closely allied to the New Zealand forms, but as there is in general no affinity whatever between the New Zealand and Hawaiian faunas, it is probably a case of a single persistent type once widely dominant, but now lingering only in isolated situations.

GELECHIDÆ.

Depressaria indecora, Butl., Ann. and Mag. Nat. Hist., 1881, 397, and *D. lactea*, *ibid.*, 398, are respectively ♂ and ♀ of the same species. This is not a *Depressaria*, and does not in fact belong to the *Depressaridæ*, but to the *Gelechidæ*; I cannot, at present, specify the genus, but it is nearly allied to those hereafter following. I am unable to understand why Mr. Butler has stated that this species possesses the true neuration of *Depressaria*, since in fact it differs widely in that respect. The same may be said of *D. gigas*, *ibid.*, 397, which is apparently cogenetic with the preceding. No true *Depressaria* occurs in Mr. Blackburn's collection, nor any allied genus; and it may be observed, that the genus is also wholly absent from Australia and New Zealand. The so-called genus *Chezala*, Walk., alluded to by Mr. Butler as a section of *Depressaria*, is virtually uncharacterized, and, therefore, non-existent; but the species on which it is founded (*C. allatella*, Walk., itself merely a synonym of *Cryptolechia privatella*, Walk., and *Crypt. latiorella*, Walk.) belongs to the *Æcophoridæ*, and is widely remote from *Depressaria*.

THYROCOPA, n. g.

Head smooth, side tufts short, erect; tongue moderate. Thorax smooth. Antennæ moderate, filiform, pubescent; basal joint moderate, simple. Maxillary palpi short, drooping. Labial palpi long, recurved; second joint thickened with appressed scales, somewhat rough beneath; terminal joint as long as second, moderate, acute. Abdomen stout, somewhat depressed, distinctly margined. Posterior tibiæ with short, dense, appressed hairs. Fore-wings elongate-oblong. Hind-wings trapezoidal, somewhat broader than fore-wings, hind margin

very slightly rounded, cilia short ($\frac{1}{2}$); costal edge folded and bent back above, forming a deep furrow on upper surface, in which lies a very long pencil of fine hairs (in ♂ only?). Fore-wings with 12 veins, 2 from considerably before angle of cell, 3 from angle, 7 and 8 stalked, 7 to costa. Hind-wings with 8 veins, 3 and 4 from a point at angle of cell, 5 parallel to 4, 6 and 7 stalked.

This does not nearly approach any described genus, but is allied to the two following genera, which together belong to a peculiar group of the *Gelechiidæ*, apparently forming a considerable proportion of the Hawaiian fauna.

Th. usitata, Butl.

Depressaria usitata, Butl., Ann. and Mag. Nat. Hist., 1881, 396.

A variable and obscure looking species, not recognisable from Mr. Butler's description. The normal form has the fore-wings dull, rather light greyish-brown, with two or three dark fuscous dots near base, two transversely placed in disc before middle, two nearer together and almost confluent in disc beyond middle, and posterior half of costa dotted with dark fuscous; hind-wings greyish-white, more greyish posteriorly. It varies principally in size and depth of colouring.

SYNOMOTIS, *n. g.*

Head with appressed scales; tongue long. Thorax smooth. Antennæ slender, filiform, pubescent, basal joint moderate, simple. Maxillary palpi obsolete. Labial palpi long, curved, ascending, second joint clothed with appressed scales, somewhat rough beneath towards the apex, terminal joint as long as second, slender, acute. Abdomen moderate, margined. Posterior tibiæ clothed with short, dense, appressed hairs. Fore-wings elongate-oblong. Hind-wings trapezoidal, slightly broader than fore-wings, hind margin very faintly sinuate below apex, cilia short ($\frac{1}{3}$); with an expansible pencil of long fine hairs at base of costa. Fore-wings with 12 veins, 2 from considerably before angle, 3 and 4 approximated at base, 7 and 8 stalked, 7 to costa. Hind-wings with 8 veins, 3 and 4 stalked from angle of cell, 5 rather bent and approximated to 4, 6 and 7 stalked.

Closely approaching *Thyrocopa* in neuration, and distinguished principally by the free basal hair-pencil of the hind-wings, and the absence of maxillary palpi, as well as several minor differences.

S. epicapna, *n. sp.*

♂. 16-17 mm. Head, palpi, antennæ, and thorax pale fuscous, mixed with

dark fuscous and ochreous-whitish. Abdomen ochreous-whitish. Anterior and middle legs fuscous, with ochreous-whitish rings at apex of joints; posterior legs ochreous-whitish, sprinkled with fuscous. Fore-wings moderate, oblong, costa gently arched, apex almost acute, hind margin slightly sinuate, moderately oblique; pale fuscous, densely irrorated with darker fuscous; an indistinct, short, linear, dark fuscous mark in middle of disc; the three discal dots hardly indicated; faint traces of a paler angulated posterior transverse line: cilia pale fuscous, irrorated with darker fuscous. Hind-wings whitish-grey, more whitish towards base; cilia whitish, with two grey lines.

Two specimens.

AUTOMOLA, n. g. = *Autostichus* *Macfarlandi* *Forster* 1882

Head smooth; tongue long. Thorax smooth. Antennæ rather stout, slightly serrate, simple, basal joint moderate, simple. Maxillary palpi rudimentary, short, drooping; labial palpi moderately long, recurved; second joint broadly thickened with dense appressed scales; terminal joint somewhat shorter than second, rather stout, acute. Abdomen moderate, distinctly margined. Posterior tibiæ with dense appressed hairs. Fore-wings elongate; hind-wings trapezoidal, as broad as fore-wings, hind margin markedly sinuate beneath apex, cilia moderate ($\frac{2}{3}$). Fore-wings with eleven veins, 2 and 3 stalked from just before angle of cell, 7 to costa. Hind-wings with eight veins, 3 and 4 stalked from angle of cell, 6 and 7 stalked.

Doubtless allied to the two preceding genera, but differing from them and almost the whole family in the possession of only eleven veins in the fore-wings, this exceptional structure is evidently due to the coalescence of the normal veins 7 and 8, which coincide for their whole length, instead of for a portion only.

A. pelodes, n. sp.

♂. 15 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish-ochreous, thinly sprinkled with fuscous; second joint of palpi externally densely irrorated with dark fuscous, terminal joint with a slender blackish median ring. Fore-wings moderately elongate, costa moderately arched, apex obtuse, hind-margin obliquely rounded; whitish-ochreous, somewhat suffused with ochreous, and thinly sprinkled with dark fuscous; a blackish dot at base of costa; a small blackish dot in disc before middle, a second rather obliquely beyond it on fold, and a third more conspicuous in disc beyond middle; a row of blackish dots between veins on hind margin and apical fourth of costa: cilia whitish-ochreous sprinkled with fuscous. Hind-wings whitish-ochreous, slightly greyish-tinged; cilia whitish-ochreous.

This is the species considered by Mr. Butler to be synonymous with the Australian *convictella*, Walk. It would be alike unexpected and interesting to find any species native to both Australia and the Hawaiian Islands; but, as a matter of fact, *convictella*, Walk., belongs

to the genus *Eulechria* in the *Æcophoridæ*, and differs from the above species in almost every important point of structure; nor is there even any close superficial resemblance.

Parasia sedata, Butl.

I cannot identify the very insufficient description originally given (Cist. Ent. ii, 560), and do not remember noticing an Hawaiian type. Mr. Butler referred the first specimen to *Gelechia*, but the second to *Parasia*, as if it were a matter of choice, though these genera are widely different. But it is in the highest degree improbable that the species is common to the Hawaiian Islands and New Zealand; and, considering its obscure colouring, the apparent uncertainty as to its structure, and the above-mentioned similar instance of mistaken identity, I think we shall be justified in regarding this identification as unwarranted.

DIPLOSARA, *n. g.*

Head with appressed scales; tongue strong, scaled. Thorax, perhaps crested (?). Antennæ rather stout, serrate, in ♂ towards base with a fascicle of short cilia ($\frac{1}{2}$) on each joint; basal joint moderate, simple. Maxillary palpi rudimentary, short, drooping. Labial palpi moderately long, recurved; second joint considerably thickened above and beneath with dense, somewhat rough scales, attenuated towards base; terminal joint as long as second, acute, posterior edge from base nearly to apex clothed with long, dense, obliquely projecting scales. Posterior tibiæ clothed with long dense hairs. Fore-wings elongate, narrow, surface with large tufts of raised scales; hind-wings elongate-ovate, as broad as fore-wings, cilia rather long (1). Fore-wings with twelve veins, 3 and 4 closely approximated from angle of cell, 5 and 6 widely remote, 7 and 8 stalked, 7 to costa, 11 from middle of upper margin of cell. Hind-wings with eight veins, 2 and 3 considerably before angle of cell, parallel, 4 and 5 stalked from angle, 6 gradually approximated to 7 at base.

A remarkable and distinct genus, certainly belonging to the *Gelechidæ*, but otherwise differing greatly from any other known. It is, however, probable that it has some direct relationship to the genera above described.

D. lignivora, Butl.

Scardia lignivora, Butl., Ent. Mo. Mag., xv, 273.

I am unable to conjecture why Mr. Butler should have referred this singular insect to the genus *Scardia*, with which it has really not a single structural point in common.

TINEIDÆ.

Blabophanes longella, Walk.

This is another instance of mistaken identity. I saw five specimens of the Hawaiian species, and they did not appear to differ perceptibly from the European *B. monachella*, Hb. But in any case it is impossible to admit that the white-headed Hawaiian species (which is perfectly constant) can be identical with the yellow-headed Indian species described by Walker under the above name. If, as I think, the species is truly *B. monachella*, it is no doubt an introduced insect.

Christchurch, New Zealand:

February 17th, 1883.

DESCRIPTION OF A NEW GENUS AND SPECIES OF THE FAMILY
GERRIDÆ (HEMIPTERA-HETEROPTERA).

BY F. BUCHANAN WHITE, M.D., F.L.S.

PLATYGERRIS, n. g.

Corpus oblongum, latiusculum, depressum. Caput oblongum ante oculos subconstrictum. Oculi intus leviter sinuati. Ocelli nulli. Antennæ cylindricæ, 4-articulatæ, corporis dimidio subæq̃ilongæ, articulo primo longissimo. Rostrum 4-articulatum, mesosterni marginem anticum attingens. Pronotum transversum, longitudinaliter trisulcatum, processu postico laud instructum. Mesonotum longissimum. Metanotum brevissimum. Elytra et alæ absunt? Abdomen brevissimum, connexivo erecto instructum. Pedes antici breves, tarsis biarticulatis. Pedes intermedii et postici elongati, ad latera posteriora thoracis inserti, tarsis biarticulatis.

Somewhat, but not very closely, allied to *Hydrobates* and *Halobates*.

PLATYGERRIS DEPRESSA, n. sp.

Nigra subnitida, capillis brevissimis adpressis albidis vestita; capite macula ovali intraoculari, pronoto linea angusta longitudinali obsoleta, rubris; acetabulis anticis anticé, coxis anticis, trochanterum anticorum vitta anteriore, acetabulorum intermediorum macula triangulari longa inferiore, acetabulorum posticorum macula triangulari brevi inferiore, coxarum posticarum macula inferiore, margine postico inferiore segmenti genitalis primi, necnon spina postica inferiore segmenti genitalis secundi plus minus sordide ochraceis.

♂ Long. 6, lat. $2\frac{1}{2}$ mm.

Habitat, Mexico (Berlin Museum, No. 3351).

The structure of this species is in several respects so interesting, that it merits a longer description than the rather brief diagnosis given above.

Body oblong, rather flattened and comparatively broad; more or less covered with close, short, adpressed pubescence. Black, somewhat shining, but this may arise from the pubescence having been rubbed off in several places. Where the pubescence remains it consists of, in some places, very short, adpressed, scale-like, flattened, white hairs, and in others of less adpressed black hairs. The pronotum and abdomen above have a bluish tinge, and the two pairs of posterior legs are brownish-black. Between the eyes is a large, oval, orange-red spot, and on the pronotum a narrow, rather indistinct, central longitudinal line of the same colour. The front of the anterior acetabula, the front coxæ, and a band on the inside of the front trochanters, a long, narrow, triangular spot on the underside of the middle acetabula, and a shorter triangle on the under-side of the hind acetabula, a small spot on the nuder-side of the hind coxæ, the middle of the hind-margin of the under-side of the first genital segment, and a conspicuous spine-like process on the hind-margin of the under-side of the second genital segment, are more or less ochraceous.

Head, without the eyes, oblong, with the sides in front of the eyes sinuate; the vertex slightly concave in the middle, and the frons convex and sloping gradually downwards. Hind-margin rounded. The eyes very large and prominent, situated at the sides of the head, and extending a little behind it, and resting on the sides of the pronotum; the inner margin slightly sinuate. Antenniferous tubercles situated at the sides of the head, and near the front, and rather flatly, horizontally, expanded. Antennæ about half as long as the body, moderately stout, four-jointed, with a conspicuous jointlet between the 2nd and 3rd joint, and a smaller one between the 3rd and 4th. First joint the longest, and slightly curved; 2nd about one-third the length of the 1st, somewhat thickened upwards; 3rd about two-thirds the length of the 2nd, and strongly incrassate upwards; 4th longer than the 2nd, and much the thickest joint, thickest in the middle, the apex curved upwards. Several of the joints have erect spine-like hairs, but these are most numerous on the 4th. Rostrum reaching to the front margin of the mesosternum, 4-jointed: 1st joint stout, short, and subquadrate, 2nd ring-like, 3rd the longest, and 4th shorter and thinner than the 3rd.

Pronotum distinct from the mesonotum, much broader than long, longest in the middle, narrower than the head with the eyes. Disc flat, with three rather obsolete, shallow, but wide, longitudinal furrows. Front margin slightly concave, hind margin widely convex, sides rounded. Prosternum smaller than pronotum, disc slightly convex, the outer third on each side occupied by the acetabula of the front legs.

Mesonotum forming nearly one-half of the total length of the body, oblong, widening slightly backwards, wider in front than the pronotum; disc flatly convex, with, on each side, a wide longitudinal furrow, continuous with the lateral furrows of the pronotum. Front margin widely concave, with the anterior angles prominent and rounded, and extending a little forwards on each side of the pronotum. Sides rounded. Hind-margin very distinctly bisinuate, the posterior angles extending considerably backwards and downwards to form the acetabula of the middle legs. Meso-

sternum very slightly convex, front margin nearly straight, the anterior angles slightly tumid, and having within them a rather obsolete furrow. Hind-margin very slightly concave, with, on each side, a shallow longitudinal furrow lying on the inside of the middle acetabula. Metanotum separated from the mesonotum by a distinct furrow; very much broader than long, and consisting of three portions. The central portion is bounded on each side by an elevated ridge, continuous with the connexivum of the abdomen, and lying to the inside of the hind acetabula; front margin concave; hind margin emarginate in the middle, slightly convex on each side; disc transversely convex, with, posteriorly on each side, a narrow, rather deep fovea, external to which is a small tubercle. The lateral portions of the metathorax extend backwards and form the hinder acetabula, hence, perhaps, they should be considered as making part of the metasternum, no part of which is visible below.

The abdomen is very short in comparison with the thorax, and does not extend backwards much beyond the base of the hind legs. Above, the abdomen (excluding the genital segments) consists of five visible segments, but another probably exists, and is covered by the metanotum, the small fovea on each side of the disc of which indicates its situation. The five visible segments are ring-like, and very much broader than long. On each side is the broad connexivum, which is perpendicular to the segments, and is continuous with the ridge that lies between the central portion of the metanotum and the hinder acetabula. Below, the abdomen has six visible segments, of which the 1st is nearly as long as all the others taken together; the 2nd is rather indistinct, but seems to be like the remaining four, ring-like, very much broader than long. The hind margins of all are concave, and the sides of the 6th are prolonged backward a little. At the middle of the hind margin of the 1st is a small tubercle, the exact nature of which in this specimen I have not been able to make out. Similar tubercles occur in species of the genus *Halobates*, and appear to be perforated at the apex, and are probably the opening of some gland.

The genital segments are a little distorted in the specimen described, but appear to be three in number, visible both above and below. The first is, above, similar to the preceding abdominal segment, but rather broader. It has an erect connexivum. Below, it is as long as the four preceding ventral segments; hind margin concave. The second segment forms a cylinder, open at the end. It is about as long as one-third of the abdomen, but narrower. Viewed from above it is oval, convex, rather narrowed at the base, and triangular at the apex; viewed from below it is rather flat, with a strong tooth about as long as the segment itself below, projecting backwards from the hind margin. The third above and the third below are apparently not united. Above, the third is a narrow, triangular plate, with blunt apex and with the sides sloping at the base downwards under the second segment, and giving rise on each side below to a long spine-like tooth. (From the distortion of the parts, only one spine is actually visible, but the other seems to exist.) Below, the third is a very convex, long, narrow, boat-shaped valve.

Front-legs: acetabulum large, cylindrical, with the circular opening looking backwards and downwards; coxa short, ring-like; trochanter large, cylindrical, slightly curved, the base abruptly bent into a narrow neck, the lower posterior part of the apex pointed to articulate with the femur. Femur stout: viewed from the outer side it forms a long narrow triangle, slightly thickened about the middle and again at the apex; the base with an excavation on the posterior side in which the trochanter articulates,

consequently, the femur forms with the trochanter almost a right angle. Viewed from the inner side, the basal half of the femur is somewhat parallel-sided, with a square base; on the under-side it tapers from the middle to the apex. Under-side armed with a few hair-like spines, as is the trochanter. Tibia slender, as long as the femur, nearly equally thick throughout, the apex somewhat dilated, the under-side produced and forming a short straight process. Tarsus less than half as long as the tibia, 2-jointed; 1st joint about one-third the length of the 2nd, slightly incrassate upwards; 2nd slightly incrassate upwards, with an excavation on the under-side before the tip, in which the claws are probably inserted.

Middle-legs: acetabula situated at the hind angles of the mesothorax, large, cylindrical, with a long suture on the under outer side, opening circular, looking backwards. Coxa cylindrical, about as long as broad, apex hollowed, with a semi-circular emargination on the outer under-side. Trochanter with a ball-like base, rather narrow neck and triangular apex to the outer upper face of which the femur articulates. Femur very long and slender, nearly equally thick throughout, but a little incrassate at base and apex, armed with a few hair-like spines, the apex with two teeth, between which the tibia is inserted. Tibia about one-third the length of the femur, slightly curved, narrowing from the base to the middle, the apex rather flatly dilated on the inner side. Tarsus two-thirds the length of the tibia, 2-jointed; 1st joint tapering from just above the base to the apex, rather flat, furrowed on the upper side from base to apex; 2nd joint about one-third the length of 1st, narrower, equally broad throughout, slightly flattened, and with a slight furrow, especially near the base on the upper-side, slightly excavated on the inner side before the tip.

Hind-legs: acetabula occupying the hind angles of the metathorax, consequently the hind-legs are inserted above the middle-legs; similar to the middle acetabula, but longer. Coxa a little longer than middle coxa. Trochanter, like middle trochanter, reaching backwards nearly as far as the apex of the abdomen. Femur rather longer and more slender than the middle femur. Tibia shorter than the middle tibia, about one-fifth the length of the abdomen, cylindrical, tapering from base to apex. Tarsus about one-third the length of the tibia, 2-jointed, joints cylindrical, 2nd about one-half the length of the 1st, slightly excavated on the inner side before the tip.

In many respects, *Platygeris* resembles *Halobates*, and still more *Halobatodes* (a new genus, of which the type is *Halobates lituratus*, Stål), but in the shape of the body, the structure of the genital segments, the form of the anterior trochanters and femora, and of the middle tibia and tarsus, as well as in other characters, it diverges very considerably. To *Hydrobates* the affinity is much less strong, though part of the structure is suggestive of that genus.

I may take this opportunity of mentioning that I think of attempting to monograph the species of *Hemiptera* that dwell on the surface of water (families *Hydrobatina*, *Hydrometrina*, &c.), and will be very glad of the loan of specimens.

Re-appearance of Phosphæus hemipterus, Geoff., at Lewes.—This curious insect has again occurred at Lewes. My friend, Mr. Cecil Morris, of this town, has taken several specimens in his garden, and, by his kindness, I have been able to see the insect in a living state. The locality is not far from the place where Miss Hopley took the first British specimens in 1868. The first specimens were seen this year on the 17th inst., and, so far, only males have been taken. The males are decidedly luminous, the light issuing from two spots on the apical segment of the abdomen both above and below. As in the glowworm, the light is produced at the will of the insect, and when not visible, a little irritation will generally render it so; this fact would make it probable that the light, at least in the male, is not used as a sexual attraction, but as a means of *frightening its enemies, and warding off danger*; perhaps it is the same in all luminous insects. The insect is very active by day, crawling vigorously over walls, &c., but it readily feigns death, contracting the limbs close to the body and falling to the ground.—J. H. A. JENNER, 4, East Street, Lewes: June 20th, 1883.

Lebia turcica.—I am informed that specimens of this species (I believe four in number) are being exhibited in London as having been purchased, with other *Geodephaga*, from Mr. C. S. Gregson, of Liverpool. In the interests of my Coleopterist brethren, will you permit to state, that I know Mr. Gregson's collection very well indeed, and that there was not a specimen of *Lebia turcica*, either British or foreign, in that collection.—JOHN W. ELLIS, 101, Everton Road, Liverpool: May, 1883.

Cicindela maritima in Carmarthenshire.—On May 24th, 1883, four specimens of *Cicindela maritima* were taken by the Rev. Clennell Wilkinson on the Sandhills near Pembrokeshire, in Carmarthenshire. I think this is a new locality for this beautiful and very local insect.—A. H. WRATISLAW, Manorbere Vicarage, Pembrokeshire: June, 1883.

Myrmecophilous Coleoptera in the Hastings district.—I have been working nests of *Formica rufa*, all situated in a wood at Guestling during the spring and early summer, and thought that my captures might be worth recording, especially as the nests are not so very far from the sea. In the beginning of April, *Thiasophila angulata* was by far the most plentiful insect, just now, however, *Homalota flavipes* is the commonest. In addition to these I have found *Dinarda Märkeli*, *Homalota anceps*, *Oxyptoda hæmorrhœa*, in some numbers, and *O. formiceticola*, *Monotoma angusticollis*, Gyll., *M. formicetorum*, Th., *Leptacinus formicetorum*, and *Quedius brevis*, sparingly, and a single example of *Myrmedonia humeralis*. I also met with a few specimens of a *Xantholinus*, which I think may be *atratus*, Heer. I was pleased to find *Clythra 4-punctata* in plenty: they were either flying in the sunshine around the nests, or sitting on the bushes overhanging them. On several occasions I have seen specimens crawling about with the ants, and once a ♀ emerging from the entrance to the subterranean cells. Between the 15th May and 12th June, I caught about sixty examples, and saw many others. *Formica fuliginosa* is, I am sorry to say, rare with us; but from a weak nest I obtained four *Myrmedonia*

funesta, one *M. limbata*, one *Drusilla canaliculata*, and one *Thiasophila inquilina*. In a nest of *L. flava*, *M. limbata* has shown itself, and *Myrmica rubra* (*lævinodis*?) has only yielded me the common *Drusilla*.—EDWARD P. COLLETT, St. Leonards-on-Sea : June 17th, 1883.

Further note on Ephestia passulella.—I find my former note on *Ephestia passulella* (Ent. Mo. Mag., xix, p. 142) was not strictly accurate, as the species is evidently only partially double-brooded. As there stated, the larvæ all spun up, and, as at the time, the imagos were continually emerging, I concluded that all would do so. Many of the larvæ, however, did not change to pupæ, but remained all the winter in their cocoons, and changed to pupæ without again feeding at all, this spring. The imagos from them are now emerging every day.—GEO. T. PORRITT, Huddersfield : June 5th, 1883.

The oldest name for the Phycita hostilis of Stephens.—Heer P. C. T. Snellen has kindly called my attention to the confusion that has arisen between *Nephopteryx rhenella*, Zincken (described in Germar's Magazine, 1818), and *Pempelia adelphella*, Fischer von Röstertamm. Both were mixed together by Treitschke under the name of *rhenella*.

The brown larva of *rhenella* feeds on *Populus alba* and *tremula* (I have a specimen from Zeller "on *Populus monilifera*"). The green larva of *adelphella* feeds on willow. The description of *hostilis* in the Manual was made from a Glogau specimen of *adelphella* received from Zeller in 1850.

Mr. Barrett has already pointed out (Ent. Mo. Mag., xvii, p. 179) that the *hostilis* of Stephens is not identical with *adelphella*, for which it had been quoted as a synonym by Zeller in the Isis of 1846. It is, however, really the *rhenella* of Zincken, which being a much older name, must supersede *hostilis*, whilst, at the same time, it will be needful to remove the insect from *Pempelia* to *Nephopteryx*.

The differences in appearance of the two species are well noted by Zeller in the Isis of 1846, p. 777. He says of *P. adelphella*, "anterior wings narrower, with the base always of a much brighter red, the first transverse line forming, at the subdorsal nervure, a sharper angle, almost a right angle, the central area is pale red instead of grey towards the inner margin, and the costa beyond the first transverse line is blackish; the hinder transverse line is more faintly toothed, and forms a sharper angle towards the inner margin."

I think it highly probable that both species may occur in this country, though, so far as we know, *adelphella* has hitherto escaped observation.—H. T. STAINTON, Mountsfield, Lewisham : May 21st, 1883.

Occurrence of Ecophora grandis near Burton-on-Trent.—On Saturday, June 2nd, I went out for the afternoon to a part of the Forest of Needwood, about eight miles from here. The place is a very tempting one, but there seemed either to be very little to be had, or else, that the place (which is high ground and cold clay) was very backward; almost my only captures being *Eupæcilia maculosana* and *Incurvaria Ehlmanniella*. About half-past four, from a holly tree I beat out a small thing which flew off sharply, but which I fortunately contrived to secure. My delight was only equalled by my surprise when I saw what I had got:—a very

fresh, beautiful, and brightly coloured specimen of *Æcophora grandis*. It was quiet in the net and box, and has taken no harm with the journey home.—J. SANG, 181, Horninglow Street, Burton-on-Trent : *June 4th*, 1883.

Insects from the East Coast of Greenland.—Mr. William Scoresby, Jun., in his "Journal of a Voyage to the Northern Whale Fishery, &c.," Edinb., 1823, 8vo, states, p. 423, the presence of *Col. Palæno* and *Pap. (Argynnis) Dia* on Jameson's Land at Cape Lister and Cape Hope, on the northern shore of Scoreby Sound, 70° 30' Lat., July 24th. Both occurred in great numbers. He mentions also (p. 188) the occurrence of bees and mosquitoes. Prof. Jameson and Mr. James Wilson give, pp. 424—428, a more detailed account of the butterflies. Curiously enough these very interesting statements of insects of the eastern shores of Greenland, which are probably the only ones known, though quoted in Lacordaire's *Introd.*, vol. ii, p. 603, have escaped Mr. Kirby (Richardson's work) and all later publications about the Arctic fauna. The same statements have been repeated by Mr. J. Wilson, in the *Family Library*, No. 53 (I can only consult the American edit., New York, 1836), in Mr. P. F. Tytler's historical view of the progress of discovery on the more northern coasts of America, with sketches of the *Nat. Hist.* by J. Wilson, p. 305.

The hope to find perhaps figures of the two butterflies in Mr. J. Wilson's *Illustrations of Zoology*, Edinb., 1828—31, for which I have noted in my *Bibliotheca* two *Lepidoptera* on pl. 4 and 28 (I cannot compare this book now), was destroyed by the record in Férussac's *Bull.*, vol. xxvi, p. 287, stating that these *Lepidoptera* are *Noctua (Strix) Erebus* and *Pap. Jasius*. If, by a lucky chance, the two *Papilios* from Mr. Scoresby should be still in existence in Edinburgh, a detailed scientific examination would be of great interest. It is possible that the so-called *C. Palæno* could be the *Colias Hecla*, var. *glacialis*, described by McLach., *Linn. Soc. Journ.*, vol. xiv, p. 108, but *C. Palæno* is very common in Labrador, and could as well go higher up in Greenland, as it is a decidedly Arctic species. I remark that the food-plant of its caterpillar, *Vaccinium uliginosum*, is represented in the flora of this part of Greenland. In Scoresby's *Journal*, p. 410, in the list of plants, Dr. Hooker gives No. 13, *Vaccinium pubescens*, Hornem., which he considers to be a dwarf state of *V. uliginosum*.—H. A. HAGEN, Cambridge, Mass. : *May 5th*, 1883.

Note on the appearance of ♂ and ♀ of Formica rufa.—Seeing it generally stated that the winged examples of this ant usually "come out" in July and August, I beg to say that this year, at Guestling, the ♂ began to appear on the 21st May, and ♀ a week later.—E. P. COLLETT, St. Leonards-on-Sea : *17th June*, 1883.

A very small nest of Vespa vulgaris.—I have recently had brought to me from the neighbourhood of Bromley, a very pretty little nest of *Vespa vulgaris*. It has been, unfortunately, a good deal broken from handling, but is of a rounded, semi-conical shape, with a round, central, apical aperture, and its widest diameter is only about an inch and three-quarters. It was found suspended under the roof of an outhouse. I believe such a locality is not a very unusual one for *V. vulgaris* to choose, but the very small size of the nest certainly surprised me. Shortly after receiving it, two worker-wasps emerged from the cells near the

centre, and I observed that nine others were spun-over at the top, the remainder were occupied by larvæ in different stages of growth, those near the centre nearly full grown, those near the circumference quite small: altogether there are about forty cells. I am afraid no more wasps will come out now, as the larvæ have died in their cells, and made the nest smell so strongly that I fear all the spun-up pupæ will be killed. The actual paper-like substance of the nest appears to consist of very fine fibres of wood.—EDWARD SAUNDERS, Lloyd's: *June 17th*, 1883.

Review.

NOUVEAUX SOUVENIRS ENTOMOLOGIQUES: ÉTUDES SUR L'INSTINCT ET LES MŒURS DES INSECTES. par J.-H. FABRE. Paris: Ch. Delagrave, 1882. pp. 319, 12vo.

In 1880, vol. xvii, p. 117, we noticed the work by this veteran author (who has long been celebrated for his minute history of *Sitaris humeralis*) entitled "Souvenirs Entomologiques," and the present volume is a continuation and amplification of his most assiduous and complete observations on the instinct and habits of the objects of his attention. There are 17 chapters, entitled: 1, L'Harmas (the name given to the scene of his researches); 2, L'Ammophile hérissée; 3, Un sens inconnu. Le Ver gris; 4, La Théorie de l'Instinct; 5, Les Eumènes; 6, Les Odyneres; 7, Nouvelles recherches sur les Chalcidomes; 8, Histoire de mes Chats; 9, Les Fourmis rousses; 10, Fragments sur la Psychologie de l'Instinct; 11, La Tarentule à ventre noir; 12, Les Pompiles; 13, Les Habitans de la Ronce; 14, Les Sitaris; 15, La Larve primaire des Sitaris; 16, La Larve primaire des Méloés; 17, Le Hyperméta-morphose.

Although the author deprecates criticism on the style of his writing by saying that "his pages contain only a narration of facts observed, nothing more, nothing less," yet the charm of it is in this very simplicity and originality of the relation of his numerous experiments and observations. The chapter about his cats, which, at first sight, looks like an interpolation, is given to show that a cat has the same innate faculty to return in a direct line to its home, even when it has been removed therefrom in seclusion, that a Hymenopterous insect in similar circumstances possesses. From the author's points of view, the hypothesis of evolution is not regarded favourably, for the experience of his forty years' observation does not support it. He rejects its theory that instinct is an acquired and transmitted faculty; such a notion being nothing more than a *jeu d'esprit* wherewith an indoor naturalist who fashions the world according to his fancy may amuse himself, but in which the observer who grapples with the reality of things finds no serious explanation of anything he sees.

Every book suffers by translation, especially such an one as this that is so full of graphic individuality; moreover, the nature of the subjects makes it difficult to detach a short extract, yet we would have tried to give in this way an idea of the merits of the work, if we had not been met at the very first page by this notice: "Toute traduction ou reproduction, même partielle, est interdite." All that we can do, therefore, is to recommend this most enticing book of Natural History to the attention of all who read, or wish to read, French.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(Concluded from vol. xix, p. 270).

RHYNCHOPHORA.

APION OPETICUM, Bach.

Allied to *A. pomonæ*, F., but differs from it in its smaller size, its invariably black colour, its rostrum being more abruptly contracted a little behind the middle, and less dilated at the base in both sexes, and in having a less elongate club to its antennæ. Two specimens (male and female) were taken by Dr. Power at Hastings (Ent. Mo. Mag., xi, 156).

Apion scrobicollæ, Gyll.

There is no authority for this insect, and it must, consequently, be omitted.

APION ANNULIPES, Wenck.

Two female specimens of this insect were taken by Mr. Champion and Mr. Rye at Mickleham in 1870. They differ from the same sex of *A. flavimanum*, Gyll., their close ally, in their entirely black and very much stouter legs and wider tarsi, brilliant and very finely punctured rostrum, &c.; the male appears to have the antennæ testaceous, except the club, and the tibiæ marked with testaceous colour before the base (Ent. Mo. Mag., viii, 159).

APION RYEI, Blackburn.

This species is separated from all the rest in the group with the femora and anterior tibiæ alone yellow, by its short, broad, sparingly punctured thorax, which is scarcely, if at all, longer than broad, and has its sides very evidently rounded; it is most nearly allied to *A. fagi*, L., from which it differs in its shorter and more strongly bent rostrum, and in its antennæ, which have a darker base. Taken by Mr. C. Lilley and Rev. T. Blackburn in the Shetland Islands, in July, 1874 (Ent. Mo. Mag., xi, 128).

CATHORMIOCERUS MARITIMUS, Rye.

Differs from *C. socius*, Boh., in being more robustly built, flatter, darker, and much more strongly punctured, with more prominent eyes, and the funiculus and club of the antennæ (comparing both sexes) distinctly broader and shorter. Taken by Mr. Moncreaff at Portsea (Ent. Mo. Mag., x, 176).

Eusomus ovulum, Ill.

This is, according to Dr. Sharp, an introduced species, and very doubtful as British.

Otiorrhynchus monticola, Germ.

O. blandus, Gyll., must be substituted for this species, as all the Scotch specimens named *O. monticola* really belong to *O. blandus*.

Liosoma ovatum, var. COLLARIS, Rye.

This variety is smaller than the type form, with femora dark at apex, thorax usually red or reddish, and less closely punctured, and the tooth on the femora feeble.

LIOSOMA TROGLODYTES, Rye.

The small size of this insect separates it from our other species, but, apart from this, its untoothed femora remove it from *L. ovatum*, Clair., and its opaque and almost rugose-punctate thorax, shorter and broader build, and more marked striæ separate it from *L. oblongulum*, Boh. Taken by Mr. J. J. Walker at Faversham (Ent. Mo. Mag., x, 136).

LIOSOMA OBLONGULUM, Boh.

Differs from *L. ovatum* in being narrower, with rostrum less curved, in having the antennæ inserted nearer the apex of the rostrum, and especially in the fact that, its femora are not toothed. Taken by Mr. Walker near Chatham, and by Mr. Champion at Caterham (Ent. Mo. Mag., ix, 242).

Lixus turbatus, Fab.

This has been considered a doubtful species. Dr. Power, however, has a specimen in his collection taken by himself in the fen district: it is the *L. iridis*, of Olivier, and the *L. gemellatus*, of Gyllenhal.

Smicronyx Reichei, Gyll.

This is not unlike a very large example of *S. jungermanniæ*, Reich., but it has a thicker and darker rostrum, and much more thickly and coarsely punctured thorax; it is densely clothed, when in perfect condition, with tessellated grey and brown scales. Two specimens taken near Folkestone by Mr. Champion and Mr. E. A. Waterhouse (Ent. Mo. Mag., ix, 11).

BAGOUS BREVIS, Schön.

Of our species, this can only be compared with *B. frit*, Herbst: its thorax, however, is very strongly constricted before the apex, and has a dorsal channel ending in the middle one of three foveæ, situated in the anterior transverse constriction. Taken by Dr. Power in Surrey (Ent. Mo. Mag., ix, 242).

BAGOUS DIGLYPTUS, Boh.

Two specimens of this very distinct species were taken by Mr. Harris near Burton-on-Trent. It may readily be distinguished by its very short broad form, uniform grey colour, rugulose thorax, which is much constricted before the apex, and has a short dorsal channel near the base, its ferruginous tibiæ, which are much curved inwardly and thickened above the middle, and its very short tarsi, which have the penultimate joints simple and not bilobed (Ent. Mo. Mag., xv, 235).

Orchestes scutellaris, var. SEMIRUFUS, Gyll.

This variety is smaller than the type, but exhibits no structural differences, merely having the head and thorax pitchy-black, and the legs darker than usual.

Orchestes decoratus, Germ.

This very doubtful species is included in the second edition of Dr. Sharp's catalogue: it has for many years been alternately inserted in and erased from the British List. In Ent. Ann., 1867, 88, Mr. Rye quotes Mr. Walton as having shown that Stephens' *O. decoratus* is only *O. rusci*, and it is to Stephens that M. Brisout refers for the type-form of the insect.

NANOPHYES GRACILIS, Redt.

This insect is readily distinguished from *N. lythri*, F., by the fact that all its femora have two small sharp spines on the under-side; it has longer and thinner legs, antennæ, and rostrum, less evident pubescence, and broader and much less acuminate elytra, of which the interstices are flat (Ent. Mo. Mag., ix, 157). Taken in the New Forest and other localities.

Ceuthorrhynchus crassidentatus, Marshall?

This insect must be erased from the British list: nothing seems to be known about it.

Ceuthorrhynchus viridipennis, Bris.

This insect comes near *C. chalybæus*. Dr. Sharp told me that he possessed a short series of an insect that he believed to be this species, but he has omitted it from the second edition of his catalogue.

Ceuthorrhynchidius minimus, Walton (Rye).

A very doubtful species, near *C. floralis*, apparently resting on two examples supposed to have been placed by Dr. Leach in the British Museum collection, where, however, they are not now to be found.

Ceuthorrhynchidius Chevrolati, Bris.

This species is apparently only a well-marked and fresh type of *C. troglodytes*, F. Dr. Sharp, however, introduces a new species into the second edition of his catalogue under this name.

CEUTHORRHYNCHIDIUS CROCHI, Bris.

This insect, which has not been particularly recorded as British, but is described by M. Charles Brisout as from England only, is said to be very like *C. versicolor*, Bris., but may be distinguished by its more depressed prothorax, of which the anterior margin is less reflexed, and by its testaceous tarsi, of which the claws are smaller (Ent. Mo. Mag., ix, 159). It is a doubtful species, apparently, as British.

Cossonus linearis, L.

It is probable that all our insects which stand under this name are in reality to be referred to *C. ferrugineus*, Clairv., and that *C. linearis* may not be British at all (Ent. Mo. Mag., ix, 243; Ann., 1874, 109).

Magdalinus Heydeni, Desbr.

The author of this species mentions it as British in his Monograph of the genus,

stating that he possesses a specimen from England; it appears to be a doubtful species, very near *M. duplicatus*, Germ.; with regard to this latter species there appears to be some doubt whether a true specimen has yet been taken in this country.

HYLURGUS MINOR, Hart.

Very closely allied to *H. piniperda*, L., but usually somewhat smaller, always with brown elytra, which are more delicately punctate-striate; the second interstice of the elytra (unlike *H. piniperda*) is set with roughened elevated tubercles like the rest; the posterior tibiæ are also differently formed. Taken by Dr. Sharp and Dr. Buchanan White at Braemar (Ent. Mo. Mag., viii, 74).

CISSOPHAGUS HEDERÆ, Schmidt.

Chapuis formed the genus *Cissophagus* for the reception of *Hylurgus hederæ*; in this genus the funiculus of the antennæ is six-jointed, and the third joint of the tarsi distinctly bilobed, whereas in *Carphoborus* (*Xylechinus*) *pilosus* the funiculus is only five-jointed, and the third joint of the tarsi is simply cordate; this insect has occurred several times in Britain, and was taken last year near Shere by Dr. Capron (Ent. Mo. Mag., viii, 107; Entomologist, xv, 212).

POLYGRAPHUS PUBESCENS, Fab.

This genus, which is new to the British list, may be readily separated from the other *Hylesinides* by each of its eyes being almost entirely divided into two parts by an extension of the lateral piece from which the antenna springs, by the third joint of the tarsi not being wider than the second, and by the non-articulate club of its antennæ, which is very large, flattened, ovate, and considerably longer than the funiculus, which is four-jointed. Taken under fir bark near Scarborough by Mr. Lawson (Ent. Mo. Mag., viii, 82).

Bruchus atomarius, L.

This ought, apparently, to be inserted instead of *B. seminarius*, L., and *B. lathyri*, Steph., instead of *B. loti*, Payk., the insects being apparently identical in either case, and the question simply one of priority; there is, however, a confusion as to the latter insect caused by Stephens (Ent. Ann., 1874, p. 111).

Urodon rufipes, F.

This is a very doubtful species, and cannot be admitted as indigenous without further confirmation.

LONGICORNIA.

PACHYTA SEXMACULATA, L.

This species is closely allied to *P. octomaculata*, F., but may be readily separated by its narrower and more parallel form, its more shining appearance, much scantier and finer pubescence, and the different maculation of its elytra, which are black with three pale yellow, transverse, angular bands. Taken by Mrs. King at Aviemore, Inverness-shire (Ent. Mo. Mag., xiv, 92).

Monohammus sartor, F., and *M. sutor*, L.

These ought, probably, to be regarded as introduced species, as much as *Cerambyx heros*, Scop., which is now generally omitted.

PHYTOPHAGA.

Clythra læviuscula, Ratz.

This species has a very slender claim, indeed, to be admitted as British, and had better be left out (Ent. Ann., 1865, 77).

CRYPTOCEPHALUS VIOLACEUS, F.

Of this species, which somewhat resembles a large *C. fulcratus*, Dr. Power possesses a specimen taken by himself in Cambridgeshire; it was also taken by Mr. Sidebotham.

Cryptocephalus bipustulatus, F.

This appears to be a variety of *C. lineola*, F., and to bear much the same relation to that species as the *var. bothnicus*, L., bears to *C. decempunctatus*, L.

Lina tremulæ, F.

The true *L. tremulæ* is not British: the *L. tremulæ* of Waterhouse's catalogue = *L. longicollis*, Suffr., a very common British insect.

Gonioctena affinis, Suffr.

This is a very doubtful species, apparently resting on one example, which certainly requires confirmation (Ent. Mo. Mag., i, 278; Ann., 1866, 115).

Crepidodera smaragdina, Foudr.

Dr. Sharp inserts this species in the second edition of his catalogue: it belongs to the *C. aurata* group, and apparently comes very near that species, to judge by Allard's description (Gal. Anisopodes, p. 311).

Several species of the genus *Thyamis* appear to be doubtful, as *T. nigra* and *T. fuscata*; the *T. melanocephala* group requires a careful revision.

THYAMIS DISTINGUENDA, Rye.

This insect comes nearest to *T. atricilla*, L., in our list, but differs from it in being on an average of rather larger size, without a dark brassy head and thorax; it is of less regularly oval outline, and has more perceptible shoulders to the elytra, longer posterior tarsi, and a longer and stronger spur to the tibiae. Found by Mr. Champion on Box Hill (Ent. Mo. Mag., ix, 158).

THYAMIS FERRUGINEA, Foudr.

This species was recorded as British by Mr. Crotch, but was afterwards dropped; it must, however, be again inserted, on the authority of one specimen taken by Mr. Champion at Caterham, and two in Mr. Rye's collection. It differs from *T. flavicornis* and *T. pellucida* in its smaller size and much stouter antennæ, of which the five or six apical joints are blackish, and from *T. Waterhousei* (which also has the apical joints blackish) in its smaller size, rather stouter antennæ, and more coarsely punctured thorax and elytra, which are much narrower (Ent. Mo. Mag., xii, 180).

COCCINELLIDÆ.

Coccinella 12-guttata.

Of this species, which is hardly ever seen in any collection, Mr. Mason and I discovered a specimen in Mr. Griesbach's collection, which passed into the possession of the late Mr. W. Garneys.

SCYMNUS QUADRILUNATUS, Ill.

This insect has alternately been inserted in and omitted from the British list; there is an authentic specimen from Kent in Mr. Rye's collection.

SCYMNUS REDTENBACHERI, Muls.

M. Brisout named a doubtful *Scymnus* from Mr. Wilkinson's collection (now in the possession of Mr. Mason) for me, as this species. It is a small insect ($\frac{2}{3}$ lin.) of long oval shape, with long grey pubescence, sometimes entirely black, but usually with a longitudinal curved band of a red or yellowish-red colour on each elytron; the legs are entirely of a pale yellow colour (Ent. Mo. Mag., xix, 67).

SCYMNUS ARCUATUS, Rossi.

This is a very distinct species, "the elytra having in common two horse-shoe-shaped whitish-yellow lines, open towards the front, of which the lower encloses the upper." One specimen was brushed out of very old ivy at Shenton Hall, near Market Bosworth, Leicestershire, by Mr. Wollaston, on August 24th, 1872 (Ent. Mo. Mag., ix, 117).

SCYMNUS LIVIDUS, Bold.

Smaller, more oval, and much more finely and evenly punctured than *S. discoideus*. It is livid testaceous in colour, and has the head and claws black. One specimen found on the sea-banks near Hartley by Mr. Bold (Ann., 1872, 91).

Lincoln : June, 1883.

THE BRITISH SPECIES OF *DICYPHUS*.

BY DR. O. M. REUTER.

Messrs. Douglas and Scott (Brit. Hem., i, pp. 370—381), as well as Mr. Saunders (Syn. Brit. Hem., pp. 284—285), describe from Britain five species of the heteropterous genus *Dicyphus*, Fieb., Reut. (*Idolocoris*, D. & S.), viz., *globulifer*, Fall., *annulatus*, Wolff, *pallicornis*, Fieb., *pallidus*, H.-Sch., and *errans*, Wolff. One of these species, viz., *pallidus*, is, however, wrongly determined, the British species noted by this name being quite distinct from the true *pallidus*, originally described from Germany by Herrich-Schäffer, and living on *Stachys sylvatica*. The British species occurs on *Epilobium*; and regarding it

as new, I name it after the food plant, *D. epilobii*.* It is also this species, which in the Ent. Mo. Mag., vol. xvii, p. 166, is quoted under the name *D. stachydis*, Reut., according to specimens found by Saunders at Hastings, and wrongly determined by me as my *stachydis*, from which it is easily distinguished amongst other characters by the longer first joint of the antennæ.

As *D. pallidus* I have quoted (Ent. Mo. Mag., vol. xiv, p. 186) a species found at Perth on *Symphytum*, still this species is not the true *pallidus*, H.-Sch., neither is it identical with my new species *epilobii*, but it agrees thoroughly with the typical specimens of *D. constrictus*, Boh., a species referred without reason by Fieber as a synonym of *pallidus*.

A very different species has been confounded with *D. errans*, Wolff. Messrs. Douglas and Scott say (*l. c.* p. 380), "frequently the ♀ has undeveloped elytra." Also concerning *pallidus*, it is said, "♀ with undeveloped elytra without euneus (!) and membrane." All the females of *epilobii* (= *pallidus*, D. & S.) which I have seen, however, have, like the female of *errans*, completely developed wings. Perhaps the paler specimens of the species, with undeveloped wings, confounded with *errans*, have been supposed to be ♀ of *pallidus*, D. & S., the darker specimens being described as ♀ of *errans*. But the ♀ of *errans* is always macropterous, as far as I know, and I have examined a great many from different parts of the palearctic zone. The species which has been regarded as being a short-winged ♀ of *errans* is, however, in both sexes dimorphous, and easily distinguished by the short first joint of the antennæ, this character allying it to *pallicornis*, Fieb. It lives on *Stachys sylvatica*, and is widely distributed in Europe; it is also found in the west of Siberia. I have named it *D. stachydis*, by which name it has already been recorded from Britain by Mr. Norman (Ent. Mo. Mag., vol. xv, p. 255), by the same author (*l. c.* vol. xiv, p. 166) given in error as *D. errans*. This species is also described by Flor (Rh. Livl., i, p. 483) as *collaris*, Fall., and by me (Hem. Gymn. Sc. et Fenn., p. 128) as the brachypterous form of *errans*.

I am publishing in the third volume of Hemipt. Gymnor. Europæ (now in the press) the more detailed descriptions of the European species of *Dicyphus*, and I shall there give a complete account of their synonymy. As the British fauna, however, now possesses seven species instead of five, and as it is not impossible that two other additional species (*pallidus*, H.-Sch., and *hyalinipennis*, Klug) may yet

* Mr. Saunders has written to me (Dec. 2nd, 1882)—"I have seen a pair of *pallidus* which Mr. Douglas has lent me; they are clearly identical with the pale *Epilobium* form."

be added to it, a synopsis of the species of this genus may not be without interest to British entomologists. From this synopsis I exclude, however, the well and easily known *globulifer* and *annulatus*, treating only of the species characterized by the head being pale above, black behind the eyes at the sides, and marked between the eyes with two brown or black stripes diverging in the front (in *epilobii* the head is mostly entirely pale). As almost all these species, especially *errans*, *hyalinipennis*, *stachydis*, and *pallicornis*, are in a high degree variable as to colour, I will try to employ principally plastic characters, which limit the species more distinctly and accurately.

- 1 (12). Antennæ and legs distinctly pubescent.
- 2 (9). Antennæ always much longer than half the length of the body (with the exception of the hemielytra); the first joint as long as, or very little shorter than, the head seen from above (at least, if the clypeus is not taken with it), and not or scarcely shorter than the posterior margin of the vertex; the second joint linear, always distinctly longer than the pronotum. The head, seen from above, not or only a little transverse, seen from the front, twice as long as margin of vertex; behind the eyes long or rather long, constricted; the front gradually declivous, clypeus rather slightly arcuated, the throat long. Rostrum reaching to, or beyond, the posterior coxæ. Legs long, or very long, the anterior coxæ reaching much beyond the middle of the mesosternum.
- 3 (4). Antennæ and legs very long. Antennæ with the first joint distinctly longer than the posterior margin of the vertex; the second joint as long as the scutellum, pronotum and head together; the last two joints together as long as the second; the second joint fuscous only at the apex. Pronotum with the transverse impression behind the middle. Thighs beneath rather densely provided with somewhat short and rigid black bristles. Posterior tibiæ with long spinulæ, about four and a half times as long as the width of the head (with the eyes). Male and female dimorphous1. *D. PALLIDUS*, H.-Sch.
- 4 (3). Antennæ with the first joint as long, or almost as long, as the posterior margin of the vertex; the second joint (♂) as long as scutellum, pronotum and head to the base of the clypeus (seen from above), or mostly (especially ♀) shorter. Thighs rather long, pubescent, beneath without black rigid bristles. Male always winged, with completely developed hemielytra.
- 5 (6). Pronotum with the transverse impression in the ♂ a little behind the middle, in the ♀ very distinctly behind the middle. Antennæ with the second joint at the base and apex fuscous, as long as the scutellum, pronotum and head to the base of the clypeus (♂), or only to the transverse impression of the vertex behind the eyes (♀); the last two joints together scarcely (♂) or distinctly (♀) longer than the second. Cuneus at the apex narrowly dusky. Posterior tibiæ about four times as long as the width of the head (with the eyes). Female dimorphous2. *D. CONSTRICTUS*, Boh.
- 6 (5). Pronotum with the transverse impression in the middle, or almost the middle.

Antennæ with the first joint in the middle largely red or piceous, the last two joints together as long as (δ) or scarcely longer than (φ) the second joint. Male and female with developed wings.

- 7 (8). Antennæ with the second joint only at the apex fuscous; the second joint as long as the scutellum, pronotum and head until the base of clypeus (δ), or only as long as the scutellum and pronotum together (φ). Pronotum at the base largely and slightly sinuated, and scarcely twice as wide as at the apex, the sides gradually diverging from the collar to the posterior angles, the pronotum being much longer in proportion to its width than in the following species. Cuneus at the apex narrowly dusky. Tibiæ at the base concolorous, the posterior tibiæ about $3\frac{2}{3}$ — $3\frac{3}{4}$ times as long as the width of the head (with the eyes). The body more slender; head almost plain, pale (= *D. pallidus*, D. & S., Saund.).

3. *D. EPILOBII*, *n. sp.*

- 8 (7). Antennæ with the second joint, at least at the base and apex, piceous, or entirely piceous, or black, as long as the scutellum, pronotum and head as far as the transverse impression of the vertex behind the eyes (δ), or as long as the scutellum and pronotum together (φ). Pronotum shorter in proportion to its width than in the foregoing species, its base at least 2— $2\frac{1}{2}$ times as long as the apex, raised, and at the margin more deeply sinuated, the sides diverging rapidly from behind the central constriction. Tibiæ at the base narrowly fuscous or piceous, the posterior ones four or almost five times as long as the width of the head (with the eyes). Cuneus at the apex largely and obliquely brown.

4. *D. ERRANS*, Wolff.*

- 9 (2). Antennæ not or very little longer than half the length of the body; the first joint always three-sevenths shorter than the head with the clypeus, or half as long as the head, and at least one-fifth to one-fourth shorter than the posterior margin of the vertex; the second joint towards the apex distinctly a little incrassated (in the macropterous specimens), distinctly shorter than the scutellum and pronotum together, mostly as long as the pronotum, the last two joints together distinctly longer than the second. Head seen from above scarcely or very slightly transverse. Legs rather long, the anterior coxæ scarcely reaching behind the middle of mesosternum. Posterior tibiæ about three and a half times as long as the width of the head (with the eyes).

- 10 (11). Pronotum at the base almost more than twice (δ) or scarcely twice (φ) wider than at the apex, the sides sinuated, diverging rapidly from behind the central constriction, the basal part above almost smooth, the basal margin rather deeply sinuated. Antennæ with the first joint one-fifth to one-fourth shorter than the posterior margin of the vertex; the third joint almost one-fourth shorter than the second, and almost twice as long as the fourth. Hemelytra developed (δ φ) 5. *D. HYALINIPENNIS*, Klug.

- 11 (10). Pronotum of the macropterous form at the base slightly sinuated, and not

* Mr. Saunders has kindly communicated me two specimens (δ φ) from the extreme S. W. corner of England ("Penzance, by sweeping"), which differ from *errans* only by the distinctly longer antennæ. The second joint is as long as the scutellum, pronotum and half the head together, and the last joints together scarcely longer than the second (δ), or the last joints together distinctly longer than the second (φ). This form still remains to be satisfactorily made out. I have not seen it among the large number of specimens from the continent which I have examined. The food-plant is unknown.

twice as wide as at the apex, only a little raised, the sides almost straight, gradually diverging from the collar to the posterior angles; the posterior disc slightly rugose. Antennæ with the first joint almost one-third shorter than the posterior margin of the vertex, the third joint only one-fifth to one-sixth shorter than the second, the fourth two-fifths to three-sevenths shorter than the third. Male and female dimorphous 6. *D. STACHYDIS*, *n. sp.*

- 12 (1). Antennæ and legs short, smooth, without hairs, pale, only the first joint of antennæ in the middle largely red or piceous, or with two piceous rings, the second only at the base piceous or entirely pale. Antennæ with the first joint only half as long as the head seen from above, the second as long as pronotum and gently thickened towards the apex, the third joint at least one-fourth shorter than the second, the fourth only one-fourth shorter than the third. Head short. Posterior tibiæ only about two and a half to two and two-thirds times as long as the width of the head (with the eyes), sparingly provided with short spinulæ. The body shorter and less elongate than in the preceding species. Male and female dimorphous 7. *D. PALLIDICORNIS*, Fieb.

Helsingfors: *June*, 1883.

DESCRIPTIONS OF SOME NEW SPECIES OF *LEPIDOPTERA*, CHIEFLY FROM THE ISLAND OF NIAS.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The species here described were almost entirely selected from two small collections made in Nias, a small island to the west of Sumatra.

RHOPALOCERA.

1. *Elymnias dolorosa*, *sp. n.*

Dark smoky-brown, the primaries almost black, but the costa, apex, and external border pale, greyish-olivaceous; secondaries with the external border more broadly pale, with six ill-defined ocelli, the fourth of which is largest and most distinct, the last two close together; external margin blackish, fringe white, spotted with blackish at the extremities of the veins and internervular folds: basal three-fourths of the wings, below, dark greyish-olivaceous coarsely and densely marbled with dark red streaks; external fourth paler, that of the primaries whitish towards the costa, irregularly marbled with red striæ, internal area greyish; external fourth of secondaries stone-yellowish in tint, striated with blackish, and crossed by a curved series of six conspicuous black ocelli with white pupils, and a pale blue patch from the pupil to the posterior edge, the first and fourth ocelli large, the sixth small, and the remainder of medium size, a conspicuous white sub-costal spot with black diffused edge below the centre of the costal margin: body brown, anus testaceous: expanse of wings, 70 mm.

Island of Nias.

Nearly allied to *E. panthera*, of Java, but larger, blacker, with the secondaries more strongly dentated, with a decided tail; the streaking below much coarser and less broken up, and the ocelli of the secondaries of four times the size, but the white spot smaller.

2. *Xanthotania obscura*, sp. n.

♂. Allied to *X. Busiris*, of Sumatra, Borneo, and Malacca, but, for its sex, larger, with longer wings; the basal half of primaries, and whole of secondaries, deep chocolate-brown instead of tawny, the yellow belt of primaries more oblique, and slightly paler; the sub-apical spot smaller; primaries below with all the darker areas decidedly darker, and the sub-marginal belt more ochraceous, crinkled rather than zigzag, the larger sub-apical ocellus black, with white pupil and pale yellow iris, instead of stone-grey with pale yellow iris; secondaries clouded beyond the cell, across the disc and on the border, with chocolate-brown; the irregular lines across the wings more angular, well-defined, dark chocolate-brown; the second and sixth ocelli large and blackish, with white pupil and pale yellow iris, the other ocelli very small; the eighth absent: expanse of wings, 73 mm.

Island of Nias.

3. *Moduza imitata*, sp. n.

Allied to *M. Procris*, but with more nearly the general aspect of *M. libnites*; upper surface mahogany-red; primaries with the apical half black; a white, irregular, oblique, quadrifid patch just beyond the middle; three sub-apical white dots in an oblique, slightly incurved series; an irregularly sinuated band of mahogany-red near the outer margin, the outer border brown-edged, and intersected by a marginal and a sub-marginal black stripe; costa at base black; the basal area crossed by the usual black markings, similar markings are also within the cell of secondaries; a transverse, bifid, sub-apical, white spot on the latter wings, two diverging discal series of almost confluent black spots; outer border as on the primaries; fringe spotted with white between the veins; body rufous-brown; primaries below paler than above; the basal area greenish-white; an oblique black dash in the cell, followed by an oblique black-edged tawny spot, below which is a second smaller spot of the same colours; the black apical half is only represented by a black margin to the white patch, followed on the radial and sub-costal interspaces by four longitudinal black streaks, on the upper three of which the white dots of the upper surface appear, but larger than above, oblique, and cuneiform; there is also a series of black spots (which, on the upper surface, are united, and form the outer boundary of the discal red band), some of these are edged externally with whitish; sub-marginal and marginal stripes reduced to black lines, the interval between which is partly white; secondaries with the basal three-fourths pale green, the basal black markings very slender; the double white spot of the upper surface black-edged, and forming the commencement of an irregular series of spots, three of which are also white with black edges, and the other two small and black, these spots are all smaller than the first; discal series of spots much reduced in size, the outer series with whitish lunules immediately beyond them; marginal and sub-marginal stripes slender, with white between them, as on the primaries; body below white: expanse of wings 68 mm.

Island of Nias.

4. *Pandita imitans*, sp. n.

Evidently a copy of the preceding species; distinguishable at a glance from

P. Sinope and *P. sinoria* by the curved patch of four increasing oval white spots just beyond the middle of the primaries; these spots are separated only by the black veins, as in the *Moduza*; the general colour of the insect is darker than in the known species, being the same as in the *Moduza*, the external border is also blacker, and the discal bands of secondaries are less curved and of more equal width, the streak limiting the basal area in these wings is also replaced by two approximated angulated black stripes, which are much nearer to the inner discal band than the streak in the other species, so that the disc is in reality crossed by three equidistant blackish bands: in addition to corresponding differences on the under surface, the external border is tinted with pearly-whitish, the sub-marginal and marginal lines are blacker; the basal half of the wing is bounded by a black line, corresponding with the outer stripe of the central band on the upper surface; the abdominal area is also more broadly greenish than in *P. Sinope* and *P. sinoria*: expanse of wings 54 mm.

Island of Nias.

5. *Hypolimnas antilope*, Cramer.

Olive-brown, the basal half of the wings suffused with darker rufous-brown; this colour on the primaries ends abruptly in an oblique line just beyond the cell; a large bifid, sub-apical, white spot, being the commencement of a series of discal spots parallel to the outer margin, the others are, however, all small, six on the primaries, and five on the secondaries; external border narrowly blackish, and traversed by two series of more or less lunate white spots; body dark olive-brown; under surface more olivaceous than above, not at all rufous; all the white spots larger, the discal series of secondaries consisting of ten spots, the first of which is larger than the others, and cream-coloured, as also is the large sub-apical spot on the primaries; the spots on the external border more sharply cut, and of a purer white than above; primaries with the costa to the end of the cell rather broadly black, interrupted within the cell by five white spots: body brown, palpi and front legs blackish, fringed with white: expanse of wings, 98 mm.

"Paso, Amboina; by a stream, 11th May, 1882" (*H. O. Forbes*).

From two fine examples in the Museum collection, there were others in Mr. Forbes' papers: the species has hitherto been incorrectly identified with a much smaller insect belonging to a different section of the genus: *H. antilope* belongs to the *H. jacintha* group, and, doubtless, has a blue-blotched male; Mr. Wallace's male evidently belongs to the same section of the genus with his "*Diadema anomala*," which follows *H. antilope* in his "Notes on Eastern Butterflies," Trans. Ent. Soc., 1869, pp. 284, 285. The types of Wallace's species passed, with his collection, into Mr. Hewitson's hands; but, I am unable to recognise his male of *H. antilope*; no typical female exists in the collection, and the only female from Amboina is what I believe to be a pale variety of *H. porphyria*, of Cramer, it certainly belongs to that section of the genus.

The following, which was in our collection when Mr. Wallace worked with it (and was regarded by him as one of the varieties of *H. antilope*), must now be named.

6. *Hypolimnus eremita*, sp. n.

Allied to *H. porphyria*; wings above purplish-piceous, with the external fourth of primaries and the external third of secondaries paler and yellower in colour, especially on the disc of secondaries; the paler area on the primaries is bounded internally, from the second median interspace by a curved series of four still paler spots, which, however, are not very distinct; a series of white spots (eight on the primaries, six on the secondaries) crosses the disc parallel to the outer margin; there are two sub-marginal series of buff-coloured spots: wings below a little paler than above; the primaries with three sub-costal, black-edged, white spots in the cell; secondaries crossed beyond the middle by a pale band; otherwise much as above: expanse of wings, 78 mm.

Dorey (*Wallace*).

The male of the above species is, I have little doubt, a form which we have from Dorey, closely resembling that sex of *H. alimena*, of Australia, but differing in the absence of white scales upon the blue band of the primaries above, and of the white sub-apical band on these wings below, also in the much less defined and less lilacine band across the disc of the secondaries on the under surface.

We have what I believe to be the male of *H. porphyria*, from Amboina and Ceram; it is also much like that sex of *H. alimena*, but possesses slight differences which seem to be constant.

7. *Charaxes niasicus*, sp. n.

♂. Allied to *C. Schreiberi*, of Java and Malacca, the upper surface greener throughout, but especially towards the base, the bluish areas having green instead of lilac reflections, and much broader, the outer edge of the belt of this colour on the secondaries sharply defined and zigzag throughout, and the marginal markings more perfectly confluent, so that the sub-marginal black belt becomes a confluent series of decreasing pyramidal spots bearing the usual series of white dots; orange marginal spots barely indicated; white band of primaries of little more than half the width, but that of secondaries the same as in *C. Schreiberi*: primaries below bluer, the green band and border yellower; the central band much wider, the red spots beyond it replaced by olive-green; the black markings with a decided green tinge; the two black spots in the cell larger; green bands of secondaries yellow, the central one much wider; the red humules on the green discal belt much paler, brick-red: expanse of wings, 90 mm.

Island of Nias.

This species must stand between *C. Schreiberi* and *C. cognatus*.

HETEROCERA.

8. *Amesia Trepsichrois*, sp. n.

♂. Mimics *Trepsichrois Verhuellii* from the same island; allied to *A. stelligera*, of Bhotan and Darjiling (Ill. Typ. Lep. Het., v, pl. lxxxiii, fig. 8), but on the upper-side all the white spots on the primaries, especially of the sub-marginal series, much larger, more elongated; the blue border more brilliant than in any known species, pure ultramarine, without the usual purplish tinge; secondaries uniformly dark pitchy-brown, with a single sub-apical white spot: on the under-side the differences are more decided, the wings being of a uniform sepia-brown colour, with fewer spots, those in the cell of primaries and the last five of the discal series being absent; the other spots are cream-coloured, and, for the most part, much larger than in *A. stelligera*, but the last of the discal series of primaries and of the sub-marginal series of secondaries are reduced to mere points; the blue borders and purple reflections are wholly wanting: expanse of wings, 71 mm.

Island of Nias.

9. *Chalcosia Enone*, sp. n.

Allied to *C. distincta*, Guérin (Delessert, Voy. Ind., pl. 24, fig. 3), but the primaries blacker, with more decided blue shot, the white veins and bands purer, the central band of only half the width; secondaries with the border more decidedly shot with blue: expanse of wings, 45 mm.

Island of Nias.

We have *C. distincta* from "India," Java and Sumatra: it is an interesting fact that, as a rule, the Nias species are not identical with those of Sumatra.

British Museum: July, 1883.

 DESCRIPTIONS OF THREE NEW SPECIES OF *CHARAXES*.

BY H. GROSE SMITH.

CHARAXES PORTHOS.

Upper-side black. Anterior-wings with a row of six blue spots, forming a band from near the apex to near the middle of the inner margin, the first spot small, the others gradually larger, the spot on the inner margin being the largest, a blue spot within the cell near the disco-cellular nervules. Posterior-wing with a similar band of spots from the centre of the anterior margin across the middle of the wing to the fold; a sub-marginal row of eight minute bluish-white spots, and a marginal thin blue line extending from the inner angle beyond the tail, which is small.

Under-side resembles *Nesiope* and *Mycerina*. This species differs from *Nesiope* in the position of the blue spots on the upper-side of both wings, and the row of small white spots on the posterior-wing, and from *Mycerina* in the absence of the broad blue band within the cell of anterior-wing, as well as in the position of the band of blue spots on both wings, and on the posterior-wing in the substitution of the row of small white spots and the thin blue marginal line for the band of blue spots on the margin of *Mycerina*.

Exp. 3 in.

Hab.: Camaroons (Fuller).

CHARAXES NICHETES.

Upper-side rich dark brown, paler towards the base. Anterior-wing falcate, crossed from the apex to near the inner angle by a sub-marginal, sinuate, rufous band, narrow at the apex, gradually widening towards the inner angle; cell with a brown spot on the sub-costal nervure in the middle, and a larger spot at the end of the cell. Posterior-wing rufous, from the middle of the wing to the outer margin with a sinuate band of dark brown containing eight small rufous spots, the six upper spots being lunular, with two short tails.

Under-side brown, paler towards the margins beyond the dark brown line, which crosses both wings from near the apex of the anterior-wing to near the anal angle of the posterior-wing, inside of which are numerous brown markings, and outside of which is an indistinct serrated line of same colour, but lighter, beyond which, on the posterior wing, is a row of eight small spots, corresponding with the small spots in the dark band on the upper-side. Exp. $3\frac{1}{8}$ in.

This species has a curious resemblance to some of the male varieties of the eastern species, *Polyxena*, especially in the band and spots on the posterior-wing.

Hab. : Camaroons (Fuller).

CHARAXES NEPENTHES.

Upper-side straw colour. Anterior-wing with the costa and apical portion of the wing, as in *Eudamippus*, dark brown, with a sub-marginal row of small spots, inside of which is another row of larger spots, and two still larger spots between the sub-costal nervules, all straw colour. A quadrangular dark brown spot at the end of the cell, the lower end of the spot, on the outside, extending down the upper and middle disco-cellular nervule. Posterior-wing with a double row of sub-marginal black spots, the outer row elongate, the inner row hastate, distinct from it, not joined as in *Eudamippus* and *Dolon*, two tails bluish-grey, outer margin black.

Under-side silvery-white. Anterior-wing with a fulvous band, irregularly marked outside with black, extending from the costa beyond the middle to near the inner angle; beyond which is a row of indistinct dark marks, and a fulvous band on the outer margin; two black spots within the cell; two black lines on the upper and middle disco-cellular nervules, the inner one sinuate, under which are two black spots: near the costa, about half-way between the cell and the first fulvous band, are two more small black spots. Posterior-wing with the double row of submarginal spots as above, the inner row bordered inside with a fulvous band, which, near the anal angle, joins an irregular fulvous band, extending down the wing along the abdominal fold from the costa, near the base, to the anal angle, where it joins a marginal fulvous band bordered with grey. On either side of the band down the wing are several black lines and spots, and two transverse, black, elongate spots on the abdominal fold, a little above the anal angle. Exp. $3\frac{1}{2}$ in.

Near to *Eudamippus* and *Dolon* but quite distinct.

Hab. : Siam (Boeck).

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from p. 14.)

All the remaining species in this Family have the eyes widely separated in both sexes, and are thus related to the smaller acalyptrate *Muscidæ*; their calyptra or alulets are always, however, more or less highly developed, so they must be retained among the *Anthomyiidæ*.

With the exception of those in the peculiar genus *Lispa*, Meigen included almost all the other species in the genus *Cænosiæ*; they differ, however, so much from each other in the size of the alulets, in the degree of pubescence of the arista, and in other characters, that it is necessary to divide them into a number of groups or genera, which I will briefly arrange or analyze in the following table:

- A. Alulets large, with unequal scales.
- B. Palpi with dilated extremities *LISPA*, Latr.
- BB. Palpi of the ordinary shape.
- C. Arista plumose *CARICEA*, Desv.
- CC. Arista pubescent or bare.
- D. Abdomen of ♂ narrow, cylindrical, and with projecting appendages *MACHORCHIS*, Rond.
- DD. Abdomen of ♂ clubbed at the end, and without projecting appendages.
- E. Internal transverse vein of wing opposite the end of the axillary vein.
- F. Forehead and epistome prominent...
MELANOCHELIA, Rond.
- FF. Forehead and epistome unprojecting...
CÆNOSIA, Meig.
- EE. Internal transverse vein opposite the end of first longitudinal vein *ATHERIGONA*, Rond.
- AA. Alulets small, with equal sized scales.
- G. Arista plumose, or sub-plumose.
- H. Anal vein prolonged to the margin of wing...
MYCOPHAGA, Rond.
- HH. Anal vein shortened *CHELISIA*, Rond.
- GG. Arista pubescent or bare..... *SCHENOMYZA*, Hal.

23. *LISPA*, Latr.

Gen. ch.—Eyes bare, widely separated in both sexes; arista plumose; palpi with dilated extremities; alulets with the lower scale much longer than the upper one; anal vein elongated, but not reaching the margin of the wing.

1. TENTACULATA, Deg.

2. LITOREA, Fall.

Only two British species have been recorded of this singular genus, which may at once be distinguished from all the other Anthomyids by the singular spatulate enlargement of the ends of their palpi. Neither of them are common; *L. litorea* is a maritime insect.

24. CARICEA, Desv.

Gen. ch.—Eyes bare, widely separated by a space of nearly equal width in both sexes; arista with long hairs; alulets well developed; tibiæ all armed at their apices with four or five spines; anal vein rather short, only reaching about half-way from the base to the margin the wing.

1. TIGRINA, Fab.

leonina, Rond.

2. CILIATO-COSTA, Zett.

pantherina?, Rond.

C. TIGRINA, Fab.

This very common species has a long arista, which is only plumose along its basal half; the distal part being nearly bare. It has only three bristles seated on black spots, behind the transverse suture, in each of the two middle longitudinal rows of setæ on the thorax. The females closely resemble those of *Spilogaster communis*, but may be at once distinguished from them by the circlets of spines at the ends of the tibiæ.

C. CILIATO-COSTA, Zett.

This differs from *C. tigrina* by having the two basal joints of the antennæ rufous; by the arista being plumose along almost its whole length; by having four instead of three bristles behind the suture in the middle dorsal thoracic rows of setæ; by the costal spine and ciliæ being much more developed; and by the transverse veins of the wings being more clouded. Rare. I only know the male.

25. MACHORCHIS, Rond.

Cænosia, Meig., Schin., &c.

Gen. ch.—Eyes bare, widely separated in both sexes; arista pubescent; abdomen of male narrow and sub-cylindrical, with prominent sub-anal appendages; alulets with unequal-sized scales; anal veins of wings not prolonged to the margin; legs elongated.

1. INTERMEDIA, Fall.

2. MEDITATA, Fall.

3. MEANS, Meig.

M. INTERMEDIA, Fall.

This, the largest species (5 to 7 mm.), is of a dull ash-grey colour; the arista is sub-plumose; the thorax is marked with two brown lines; the abdomen is long, narrow, cylindrical, and immaculate; the legs are yellow, with the exception of the fore femora, the coxæ, and the tarsi, which are all grey; the hind femora are longer than the abdomen; the pulvilli are large and yellow. Not uncommon.

M. MEDITATA, Fall.

The arista has only short pubescence; the abdomen of the male is shorter and more conical than in *M. intermedia*; marked on the dorsum with four brown spots, and furnished on the under-side of the penultimate segment with a very large projecting process; the legs have the coxæ, femora, and tarsi, all black, and the knees and tibiæ yellow. Rare.

M. MEANS, Meig.

This species is very similar in form to *M. intermedia*, but is smaller (4 mm.); the arista is sub-plumose; the abdomen immaculate; alulets rather small, but with unequal scales; the legs are entirely black, with the exception of the knees and the proximal thirds of the fore femora, which are yellow. Not common.

(To be continued).

FURTHER INFORMATION AS TO THE MIGRATORY HABITS OF THE GALL-MAKING *APHIDES* OF THE ELM.

BY JULES LICHTENSTEIN.

My good and learned friend, Professor Horváth, Director of the *Phylloxera* station in Budapest, is an eminent Hemipterist, well known from his many good works on the *Hemiptera-Heteroptera*. He has now lately entered on the study of the *Homoptera* also, and has made such good progress that he became in a few years the first authority in his country for the knowledge of the *Phylloxera*, and was appointed director to the *Phylloxera* station of Hungary.

When I had the pleasure of seeing him here, I called his attention to my new ideas on the evolution of plant-lice from galls, and asked his good aid to support me against some of my adversaries in Paris, who consider, as a poetical fancy, my theories of migrations from plant to plant, or even from galls on trees, like elms or poplars, to grass roots.

Prof. Horváth is a sharp observer, and deserves more than any one the adjective of "*oculatissimus*," so often employed in entomology. Thus, I had the pleasure, soon after having charged him with that work of observation, to see in a French entomological paper (*Revue Française d'Entomologie*, April, 1883) a note from Horváth announcing that my theories were deserving of full confidence, for he had attentively observed the root-louse of the *Zea mäs* (*Pemphigus zeæ-mäidis*, L. Dufour, after F. Löw), and had arrived at the conviction that it flew from the maize-roots to the trunks of the elm trees where it deposited the sexual forms.

Of course, I was highly pleased with this discovery, much more

so, indeed, than was M. le Professeur Balbiani, who had on former occasions declared such a migration quite opposed to entomological and botanical laws.

Moreover, as only one species of *Pemphigus* is known on the elm tree, viz.: the *Pemphigus pallidus*, Haliday (sub. *Eriosoma*), I fancied it was now a very easy job to gather galls of that insect when the emigration takes place, to put the emigrant winged-lice on roots of maize, and to notice how they thrive.

Under a bell glass I placed some good clean garden earth, in which I had planted some grains of Indian corn, and I thought, at the same time, I could try also to put besides the *Pemphigus* galls the other four galls of the elm tree.* There is a sixth gall-louse on elm, the *Colopha compressa*, but it occurs only on *Ulmus effusa*, and never on *Ulmus campestris* in which the others are abundant. Well, to my great disappointment, not one of the young *Pemphigus* touched the maize-roots; they were all dead and dried up, in a few days. But, to my still greater astonishment, the young of *Tetraneura ulmi*, the most common of all the elm gall lice, fixed themselves immediately on the tender rootlets of the plant, and went on sucking and growing so satisfactorily, that, in ten days, they had acquired nearly double their previous size, and were covered with the usual white secretion, which we generally see on these insects.

Immediately the idea occurred to me that M. Horváth finding a root-louse on the Indian corn, had jumped to the conclusion that it could be no other than the *Pemphigus zæ-mädis*, and had never thought that it might be a *Tetraneura*.

Indeed, the difference between the two genera is a very trifling one: *Tetraneura* has but one cubital nervure in the under-wings, while *Pemphigus* has two, and no under-ground species of *Tetraneura* is known up to this time.

Hence, I wrote to Prof. Horváth:—"Please, dear friend, send me at once what you call *Pemphigus zæ-mädis*." By return of post I had the insect; I put it under the microscope, and saw at once it was a *Tetraneura*, and the very *Tetraneura ulmi* upon which Baron von Gleichen began his well-known observations, in Nüremberg, in 1770, and of which the full biology has also been discovered only in 1882, in Budapest; so now we know exactly:

1st.—That the "*Tetraneura ulmi*" comes out of eggs deposited in the crevices of the trunks of the elm tree, in the beginning of May, and forms a gall on the leaf. It is the *Pseudogyna fundatrix*.

* Viz.: *Schizoneura ulmi* and *lanuginosa*, *Tetraneura ulmi* and *rubra*.

2nd.—That in the gall the *fundatrix* deposits a great number of young, which all acquire wings. They are the *Pseudogynæ migrantes*, which fly away. Elaborate treatises, full of exact observations about those two stages of life, have been published by Baron von Gleichen, in 1770, and by Prof. Kessler, in Cassel, in 1878–1882.

3rd.—The young lice deposited by the *Pseudogyna migrans* have been educated by Lichtenstein, in Montpellier, on roots of maize, for a fortnight. Prof. Horváth, in Budapest, has found them on the roots of the same plant in October, 1881–82; it is the *Pseudogyna migrans*, apterous and subterranean.

4th.—The descendants of these apterous lice get wings and return to the elm; these are the *Pseudogynæ pupiferae*. Horváth has found them at the roots of maize, and many other observers, Lichtenstein, Kessler, Courchet, &c., have found them on the elm trunks. Here they bring the sexual forms, which copulate and lay the eggs, out of which proceed the *fundatrices*.

And so, as Columbus, when searching for India, discovered America instead, Prof. Horváth, thinking he had discovered the evolution of *Pemphigus zæ-mäidis*, has discovered the biology of *Tetraneura ulmi*.

La Lironde, Montpellier :
11th July, 1883.

DESCRIPTION OF THE LARVA, &c., OF *MELIANA FLAMMEA*.

BY WILLIAM BUCKLER.

It is a great satisfaction to have figured the larva of *flammea*, and to be able to offer the following description of it, and of the pupa; as hitherto, so far as I know, it appears as in the Manual to have remained among the “unknown”; a circumstance not very surprising from the fact of its being a fen-haunting species of obscure habit and restricted in its locality.

Here I desire to express my deep sense of thankfulness to Mr. W. H. B. Fletcher, for his great kindness in supplying me with a dozen examples of the larva on the 18th of September, 1882, and on subsequent occasions with their food, which otherwise I could not have obtained for them; also for points of interest connected with the discovery of the larva by his friend Mr. F. D. Wheeler of Norwich, some three or four years ago, who, while collecting in the Norfolk fens, was interested in the appearance of this larva and took some home, where they spun up in the heads of reeds, and yielded the moth in the following spring.

I found, just as I had been instructed by Mr. Fletcher, that the larvæ spent most of their time within the old hollow stems of *Arundo phragmites*, several harbouring together in a stem, wherein they lay stretched out at full length, one beyond another, and came out at night to feed on the leaves of fresh reeds; at first consuming a tolerable quantity, then less by degrees towards the end of the month, when their feeding had entirely ceased; each stem was now stopped up by a diaphragm or plug of pale whity-brown silk, spun across a little within each end; at the same time I became aware of one larva having fastened two stems together that had lain side by side among the leaves, and it had cleverly utilized the situation by loosening a portion of the old sheathing-leaf from one of the stems, and after creeping beneath this had, by means of silk threads, spun it firmly on both stems as the covering and protection of a sufficiently commodious puparium between them.

On the 2nd of October, when about to place them in a cage for the winter, I noticed a larva much contracted in length and fast approaching the pupal change lying loose amongst the leaves; beneath these at the bottom I presently found one had already become a pupa, and was lying there naked and unattached.

The two last mentioned, as well as those spun up in the stems, all disclosed fine and perfect specimens of the insect in this present month of June, the first was bred on the 5th, and the last on the 15th. By means of gentle forcing Mr. Fletcher succeeded in producing the moth as early as the 1st of April, and afterwards quite naturally and freely, rather in advance of mine.

A first view of the larva is very suggestive of an immature *Leucania*, more perhaps of *straminea* than of any other species I am acquainted with, though not in its general colouring, as it differs considerably from that species in having a much dingier appearance, matching fairly well some of the old reed stems; moreover, on a close inspection it is seen to have an extra fine line on either side, in addition to the usual arrangement of fine lines alternating with stripes that are observed on a true *Leucania*.

The full grown larva of *flammea* is 1 inch 2 lines in length, apparently cylindrical, yet it is somewhat flattened beneath and slightly tapering at each end, the skin is soft and smooth, the segmental divisions moderately well defined, and the usual sub-dividing fine transverse wrinkles also, which are more noticeable on the sides, the anal legs rather splayed; the ground colour above is greyish ochreous-brown faintly freckled with a darker fine reticulation, beneath, it is

paler inclining to greyish-drab; the shining head is delicately reticulated with darker grey-brown, the plate on the second segment is a trifle darker than the ground of the back and glistens slightly, and is traversed by the dorsal and sub-dorsal lines; the dorsal line is pale, and very thin, but well defined throughout its course by running between two fine lines of dark grey-brown which rather conspicuously relieve it; a little above the sub-dorsal region the ground is broken by a stoutish paler line, then after an interval or what may be termed a stripe of the ground colour comes the sub-dorsal thin line, of a paler tint, closely followed by two other similar lines though more sinuous in character, *these three are equi-distant*; from thence midway toward the spiracular region runs a stout pale line; the spiracular stripe like the belly is of a pale somewhat greyish-drab tint well defined with an edging line both above and below of still paler tint; the black dots of the trapezoidals are so minute as to almost escape notice, but the single black dots of the row along the side are larger, also the row of two's lower down in line with each spiracle situated between them, this is whitish tenderly outlined with black; other very minute black dots follow beneath, the legs are of the same tint as the belly and have dark brown hooks.

The pupa is $7\frac{1}{2}$ lines in length, of a slender, rather cylindrical figure, the head is rounded above and produced a little obtusely beneath, the thorax is rather the stoutest part, otherwise it is nearly equal in substance throughout; the wing covers of moderate length, wrapped close to the body, the moveable rings of the abdomen are deeply cut, and each with an anterior margin of punctate roughness on the back, the last two rings taper to the anal tip, which is furnished with two very minute thorny points and curly-topped bristles; its colour at first is light brown, and soon grows reddish-brown, and in twenty-four hours the darkest mahogany-brown, later to blackish-brown, the surface rather shining.

After all the insects were bred, an examination of the interior of the stems showed one piece of four and a half inches long having a knot at one-third of the length, and in this shorter division one puparium, and a pupa skin with its tail near the knot, on the other side of the knot in the longer division two pupa skins, one beyond the other, lying reversed so that the tails of all three pointed towards the knot; a diaphragm of silk mixed with gnawed particles from the lining membrane of the stem was at either end of each puparium, which in length varied from nine to eleven lines, and comfortably held the shrivelled-up larval skin, the diaphragm in front of the middle occupant

had been doubled in thickness, and probably this insect had to wait for its escape until the puparium in front was freed. Two other stems, about two and a half inches in length, contained two pupa-skins in each, with their tails towards each other; three shorter pieces of stem had in each one pupa-skin; another stem three inches long was like all the others in being well lined with silk, it held a single diaphragm, but was otherwise empty.

Emsworth : *June 27th*, 1883.

SOME NEW SPECIES AND GENERA OF *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

(*Concluded from p. 27*).

SAPHORHYNCHUS, *n. g.*

Antennæ inserted near together, on the front of the sides of the rostrum behind its middle, elongate; scape elongate, reaching considerably beyond the eyes; club elongate and slender. Rostrum longer than the thorax, curved, thickened at point of the insertion of the antennæ, in front of this smooth and cylindrical; parts of the mouth small, mandibles but little exposed: scrobes deep and large in front, visible from the front, short, passing backwards, becoming rapidly vague and not attaining the eye. Eyes oval; thorax in front with ocular lobe, touching and slightly covering the hind margin of the eye. Thorax convex, front margin of prosternum emarginate; no rostral channel; front coxæ quite contiguous; metasternum rather elongate; abdominal sutures straight; tarsi well developed, the three basal joints densely clothed with pile beneath, 3rd joint broad and short, deeply cleft; claws very divergent.

This appears to be another very anomalous form of *Curculionidæ*, and I cannot point out any near ally for it; the insertion of the antennæ far back on the rostrum, but near the front, so that they are less separated than usual, the insertion taking place on an incrassation, so that the scrobes, very deep at the insertion, are almost provided with pterygia, together with the elongate scape, seem to suggest that the insect is an isolated form that may be placed between *Clypeorhynchus* and the Australian *Rhinaria*.

SAPHORHYNCHUS LONGICORNIS, *n. sp.*

Angustulus, convexus, piccus, corpore, cumque pedibus, griseo-

squamoso, rostro ante antennas nudo sub-lævigato; prothorace elongato, rugoso; elytris interstitiis alternis, 3°, 5°, et 7°, plus minusve breviter vageque costatis, lateribus ad humeris vix angulatim prominulis.

Long., excl. rost., 6½ mm.; rostri, 3½ mm.

Rostrum curved, deflexed, above the antennæ rugose and clothed with pale scales, below the antennæ bare. Antennæ with elongate scape, which does not quite equal in length the funiculus, second and third joints very elongate, the following joints gradually shorter, but even the eighth elongate, club elongate, slender, acuminate, evidently three-jointed. Thorax sub-globose, but rather longer than broad, very densely and coarsely sculptured, and bearing numerous pale scales. Elytra elongate, with series of coarse punctures, which, however, are not distinct, the surface being rather uneven, and bearing a clothing of scales, apparently easily removed; at each side, just behind the shoulder, there is a slight angular prominence; they are much declivous behind, and on the curved portion the suture is somewhat elevated, the third interstice is a little elevated near the base, and again about the middle, the fifth interstice is more evenly elevated, but the elevation does not extend to the base or the extremity, and the seventh interstice is slightly elevated from the sub-humeral projection backwards. The legs are elongate and clothed with scales and hairs, the tarsi with hairs alone.

The specimen of this insect sent to me by Mr. Helms as No. 229 was found in the same locality as *Clypeorhynchus gracilipes*, viz., Mouri Creek.

DORYTOMUS ELEGANS, *n. sp.*

Angustulus, fulvo-testaceus, opacus, squamosus, squamulis pallidis, elytris pone medium fascia valde angulata subnuda, brunnea; prothorace cylindrico, elytris angustiore.

Long., excl. rost., 3½ mm.

Rostrum opaque, behind the insertion of antennæ with some scales, vertex with a large brown patch on each side; eyes not prominent. Thorax rather longer than broad, narrow, nearly straight at the sides, rather densely clothed with pale scales. Elytra narrow, elongate, and parallel at the sides, till near the extremity, clothed at the base with pale scales, a line of these proceeding backwards from each side to the suture, so as to form a V-shaped mark, immediately precedes a space of darker colour, from which scales are nearly absent, and is very conspicuous; immediately before the apex there is another less definite band of pale scales. The tooth on the anterior femur large.

I have received two specimens of this very distinct species from Mr. Helms. It will probably prove to be entitled to generic distinction when the New Zealand *Eirrhini* are thoroughly and critically dealt with.

EUGNOMUS ARGUTUS, *n. sp.*

Angustulus, rufescens, subtus squamulis albidis (ad humeros densioribus et subochraceis) vestitus; superne pile depressa vestitus, scutello

suturaque ad basin albido-squamosis, elytris ad basin circa scutellum fasciaque mediali sat arguta nigro-sanguineis. Long. 4—4½ mm.

This species has the surface more densely clothed, and with a rather more definite limitation of the marks than is usual in the allies. The antennæ are pale red, and the rostrum is red, the head behind the eyes more obscure; both are densely punctate, as is also the thorax, and all these parts are clothed with depressed, fine, hair-like scales of a pale flavescent colour, a white line of rather coarser scales running along the middle of the thorax; this white line is continued along the scutellum and on the basal portion of the suture; and around the pale line thus formed at the base of the elytra, there is a patch of colour of a much darker red than the general ground colour, and on the middle there is an irregular sub-angulate fascia of similar dark vinous-red colour: the rest of the elytra have a pale clothing, which is most dense and definite behind the medial fascia: the surface bears a few fine, upright, pale hairs.

Mr. Helms has sent five specimens of this species from Grey-mouth; and I have a pair in bad condition of a closely allied but distinct species, found by Mr. Wakefield at Christchurch.

TYCHANUS BUFO, *n. sp.*

Latus et brevis, squamulis depressis densissime vestitus, rostro fere nudo, lato, opaco, nigro, antennis ferrugineis; prothorace antice valde angustato, margine anteriore in medio bi-angulariter prominulo; elytris utrinque prope scutellum sub-nodosis, posterius declivis utrinque ante medium fascia albida, cuneiformi.

Long. rostr. excl., 5½ mm.; lat., 3 mm.

The rostrum is scarcely so long as the thorax, is not curved, but is broad, dull above, punctate, but not densely, some of the punctures bearing a depressed seta. The antennæ are entirely ferruginous. The thorax is as broad behind as the elytra; from the base to the middle it becomes slightly broader, and has sharply defined sides, in front of this it is excessively narrowed, the elevations over the head are very distinct, and there are on the middle two transverse, rather ill-defined, sub-angular elevations, the whole surface evenly clothed with rather coarse griseous-brown scales, probably variable in colour. Elytra clothed with scales, finer than those on the thorax, but rather similar in colour, and not variegate, except by a large, pale, very conspicuous, wedge-shaped mark on each, extending from each side towards the suture, which, however, it does not reach; on the basal portion there are some coarse pits. The legs are densely squamose, and the femora have a large angular prominence.

This insect has more the facies of a *Sympedius* than a *Tychanus*; indeed, the limits of these *Acalles* genera are not at present very definite.

Mr. Helms has sent *T. bufo* as No. 134, and informs me it is rare at Grey-mouth.

Thornhill: March 22nd, 1883.

Abundance of Plusia gamma at Hartlepool.—Mr. Barrett desires information respecting this insect from the south or south-west of England. May I be allowed to give an account of its appearance in exactly the opposite quarter, the north-east? From want of time, I have only been able to run out at night to some tufts of *Silene* flowers on the railway side. I first went in the evening of May 21st, and found *Plusia gamma* swarming. They fly rather earlier than most of those insects that frequent *Silene inflata*, and have a hovering habit, very like *M. stellatarum*. From that time to the present (7th July), they have been most abundant. I, too, noticed their fine condition, but do not think that very unusual. Indeed, wherever they came from, they must have hibernated. I think they are generally more slate-coloured in spring than in autumn, the deeper hues probably fading during their winter sleep. I have taken one, and seen several, very small in size, that I took only expanding $1\frac{1}{2}$ inches. I saw none last autumn, and it has been comparatively scarce since 1879, when it occurred in all stages in countless thousands. I have had no opportunity of observing *V. cardui*, but even here, so far to the north, the summer insects in 1879 deposited their eggs, and the larva perished in the autumn for want of food, when the thistles died down.—JOHN E. ROBSON, Hartlepool: *July*, 1883.

Plusia gamma and Vanessa cardui at Hartlepool.—Since sending note on the abundance of *P. gamma*, I took the opportunity to-day to go in search of *V. cardui*, that I might add my mite of testimony one way or other. I made my way to some waste ground, much overgrown with thistles, as the likeliest spot near here for the insect to be found. Before I had actually reached the place, I saw it on the wing, and found it there in greater abundance than I had ever seen it before. I captured two or three to examine, and found them in good condition, though rather faded in colour, but that seemed more the effect of hibernation than wear. The swarm, therefore, of both these insects, to which Mr. Barrett calls attention, has at least been large enough to extend from Wales to the North-East of England.—ID.: *10th July*, 1883.

Description of the larva of Pempelia betulæ.—On June 2nd last, accompanied by Mr. George Tindall, I visited the Green Farm Wood, Doncaster, to search for the larvæ of *Pempelia betulæ*. Mr. W. Warren, of Cambridge, had told us he used to take it there, and, following his instructions, Mr. Tindall soon discovered a fine, nearly full-fed specimen; and, before the afternoon was over, we had each the satisfaction of having secured several.

Length, about three-quarters of an inch, and rather slender, but not conspicuously so, in proportion. Head a little narrower than the second segment, it has the lobes rounded, and is, as is also the second segment, polished. Body cylindrical, thickest in the middle, tapering gradually and evenly towards each extremity. Segmental divisions clearly defined, the skin soft and velvety, very sparingly clothed with short hairs. Ground colour dull velvety-black, head black and glossy, but very prettily marbled on the lobes with clear white, and there is also a white streak above the mandibles. Two clear, bright, lemon-yellow (white on the second and anal segments) stripes extend through the centre of the dorsal area, running parallel from the second to the twelfth segment, where they unite and form

one stripe through it and the thirteenth. (When quite full-grown, these stripes become paler, and are then of a warm cream-colour.) The only indication of sub-dorsal lines is in an indistinct and interrupted series of small white dots (more numerous in some specimens than in others), from the second to about the ninth segment. The spiracular stripes are of the clear bright lemon-yellow of those of the dorsal area, and below them is another equally broad, but more interrupted, white stripe. Spiracles black, the hairs grey. Ventral surface and pro-legs uniformly dull black, anterior legs also black, but highly polished. The larva is very pretty, and is a conspicuous and striking object when at rest, stretched along the midrib under a slight web on the upper-side of a birch leaf, the spinning of the slight web draws the edges of the leaf, and turns them up a little on each side.

The bright colours are evidently not assumed until the last moult, but, unfortunately, I have no description of the larva in an earlier stage. Whilst collecting the larvæ, I put in a separate box a number of supposed birch-feeding *Tortrices*, &c., one of which developed into a bright *Pempelia betulæ*, but the only recollection I have of it when found, is a dull uninteresting looking larva, brownish-black, with dingy, pale, double dorsal stripe. This specimen did not spin up until quite the end of June, whereas all the others were enclosed by about June 10th. My larvæ formed their cocoons in the corners of their cage, but Mr. Warren writes me that, in a state of nature, "the larva makes a conspicuous white web in a leaf, or more frequently draws three or four leaves together; these nests are easily seen, and it pupates within them." The pupa is from three-eighths to half-an-inch long, is rough, but highly polished, of the usual shape, except that it has a more pointed appearance, caused by the abdomen tapering rapidly to the anal segment, which ends with a rather sharp point. All the parts are prominently defined, the colour uniformly black. My first imago appeared on July 3rd, but Mr. Tindall had one out on June 29th, and two more the day following, and he captured a female specimen at large in the wood on the 28th.—GEO. T. PORRITT, Huddersfield: *July 11th*, 1883.

Tenthredo testudinea, *Klug.*—On the 20th May, an espalier apple-tree was covered with blossoms, from which a hundred or more apples set, but on the 20th June, sixty of these, each about the size of a hazel-nut, were lying on the ground. Each was found to have a black hole on one side, and in some, at a little distance, was another larger, from which black matter was exuding. On cutting open the apples, it was seen that they were mere shells, nearly filled with black-brown powdery ejecta, those with one hole containing also a larvâ, but from those with two holes the larva-tenant had escaped: they have their exits and their entrances, they made the small hole to go in, and the larger one to get out: on the 29th June, the tenements were all vacated. The eggs from which the larvæ came had been laid in the flowers, so that the active, eating-life of the larvæ had existed only for four or five weeks, and yet, during that time, they lived fast, for they were plump, sleek creatures, half-an-inch in length, when turned out of their banquet-halls, though while *in situ* they had been obliged to conform to circumstances, for, what with that which they had eaten and voided, and that which they still had to eat, they had no option but to assume a curved, recumbent position. Then, having fared sumptuously every day (and night, too, doubtless), they turned out into the open world, and, like

their progenitors, will have to brave the perils of their life to come, during a rest of eleven months in ante-natal tombs, whence the perfected survivors will arise next May to continue the yearly round of their race. Not before, not after, the time when apple-blossoms come will they appear; if they came forth at any other period the race would be extinguished. Strange, yet true: a striking instance out of a thousand of the care and prevision of Nature.

To return to the larvæ. I took one in my hand, in order to obtain an observation of its longitude, and it at once obligingly put itself into a straight position. Then I saw that it had twenty legs: six thoracic, long and tapering; twelve ventral, short; and two anal; the head comparatively small, that is, not in proportion to the fat body—not an unusual thing with obese animals—and, except this head, which was of a darker hue, the whole larva was of a pale cream-white. I hope I may be forgiven for mentioning cream in this connection, for there was more than met the eye, the nose being involuntarily brought into requisition by a villainous scent that exhaled from the not uncomely creature, which had thriven despite the defective sanitary state of its dwelling. The smell was more like that of a *Cossus* larva than that of Eau de Cologne (which, in the opinion of a Scotch fish-wife, is a “bonnie stink”), and, like the odour of sanctity, no doubt serves to place the possessors within the cordon of protected creatures, for the bird, beetle, or other aggressive animal that would eat such unsavoury morsels as these, must have a rare and degraded appetite. Will it be argued that the stink is the result of cumulative mimicry, or that it is a property entailed by the remote ancestral proprietor of the protective essence? How did he or she invent or acquire it?

I have been able to identify this species by the account given of it by Professor J. O. Westwood, in his paper on saw-flies, in the “Entomologist’s Annual,” for 1858, page 134.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: July 2nd, 1883.

Cleptes semiauratus bred.—As this insect seems uncommon here, I have met with no more than eight specimens; the capture of a specimen a few days ago, sufficed to recall the circumstance of my having once or twice bred the species. I have an impression that I once bred a ♀ from the puparium of a Dipteron, obtained by digging; but, as this occurred when I did not label my specimens, there is no proof forthcoming. A case which admits of no doubt, is my having dug at roots of poplar, in the autumn of 1871, the cocoon of a *Nematus* (probably *N. cæruleocarpus*, Htg.), from which emerged, on June 26th, 1872, a ♀ of *C. semiauratus*. I have the insect and cocoon, both labelled, and lettered in addition, at the time. The exit-hole is at the side of the cocoon.—J. E. FLETCHER, Worcester: July, 1883.

Athous difformis.—This insect, which is usually looked upon as a very scarce thing, has been taken near here at Guestling, in great abundance this year. I think that the reason why it has not been found elsewhere for some years is, that collectors have not looked for it at the right time of day, or, rather, night. I find it by sweeping the standing grass in the evening. It is most numerous about 8 p.m. On the 28th June I obtained four dozen specimens: the next night Mr. Bloomfield caught six dozen, and to-night, between us, we took over one hundred specimens. Among all these there were only two or three ♀. I have often swept the same places in the day-time, without getting one of either sex. It has also turned up

sparingly in the same place where I found it last year. It would be well if some Coleopterist, resident in the south, would try elsewhere to obtain this species in the same way.—EDWARD P. COLLETT, St. Leonards-on-Sea: 4th July, 1883.

Coleoptera at Dulwich.—Notwithstanding the constant encroachment of bricks and mortar, the neighbourhood of Dulwich would still seem to possess some title to its old fame as a productive hunting-ground for the entomologist, at any rate, so far as the *Coleoptera* are concerned. Thus, from faggots this year I have taken, among many others, the following species: *Megacronus cingulatus*, *Phlæopora corticalis*, *Coryphium angusticollis* (several), *Cryptophagus pilosus*, *Lathridius testaceus*, and *Bolitochara bella*, the latter in profusion. Fungi have produced *Scaphisoma agaricinum*, somewhat commonly; *Liodes humeralis* in abundance; *Amphicyllis globus*, *Triplax ænea*, and various *Gyrophæna*, &c. Clinging to the under-surface of branches, &c., lying upon the ground, I have found *Ischnoglossa rufo-picea*, *Aleochara morion*, *Conurus immaculatus*, *Clambus minutus*, *Leptinus testaceus* (one only), *Acalles ptinoides*, *Alexia pilifera*, and *C. vestitus* (several); *Aleochara lata* in some numbers from carrion; *Homalota cinnamomea* from *Cossus* burrows; *Bryaxis Helferi*, *Throscus dermestoides* (in numbers) and *Apteropeda graminis*, by night, sweeping; and *Megatoma undata*, upon a fence, complete the list.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood: July 3rd, 1883.

Obituary.

Dr. Gustav Flor, Professor of Zoology in the University at Dorpat, died there on the 13th May: of his age, or the cause of his death, we are not informed. He is known in England by his great work on Livonian Hemiptera, "Rhynchoten Livlands," in two volumes, published at Dorpat in 1860 and 1861, which, in their design and execution, show the mind of a master, the leading characteristic being the importance he assigns to the genitalia in indicating generic and specific differences and affinities: thus he kept to large genera in contrast to the infinitesimal genera founded on the exaggerated importance of microscopic variations of structure in use by the analytical school, of which an example appeared in Fieber's "Europäischen Hemiptera," published in 1861.

He also published: "Zur Kenntniss der Rhynchoten: Beschreibung neuer Arten aus der Familie Psyllodea, Burm." (Bull. Soc. Imp. Nat. Moscou, 1861). "Beiträge zu einer Kritik der von Fieber in den Jahren 1858—61, veröffentlichten Schriften über Rhynchoten" (Wien. ent. Monats., vi, 1862).

Besides these we know not of any entomological work published by Dr. Flor. In 1865 he wrote to us that during the winter of that year the third volume of his "Rhynchoten Livlands," containing the *Aphides*, would be published; but it did not appear, nor, as far as we are aware, were his entomological labours continued. Some years after he excused himself from giving an opinion about some critical questions respecting species, on account of the defective vision with which he had been afflicted: this probably caused the greatly regretted cessation of his entomological work.

NATURAL HISTORY OF *ENDROMIS VERSICOLOR*.

BY WILLIAM BUCKLER.

A long cherished desire of obtaining eggs of this species, for the purpose of watching the larva through all its stages, was gratified on 6th of May, 1881, when a dozen laid on bits of paper and birch twig were sent me by Mr. H. McArthur from Rannoch.

The larvæ began to hatch in the early morning of May 22nd, and continued to appear at intervals throughout that day and up to the next morning, when the two latest were hatched.

At once the young larvæ took readily to birch as their food, and moulted the first time on the 28th—30th of the month; on the 3rd of June, most of them had again moulted, and on the 9th and 10th, for the third time; and their last (the fourth) moult began on the 17th, and concluded within a few following days.

Full growth was attained by some on the 26th of June, and from this date onward the remainder matured at intervals one after another until the 9th of July, when the last larva retired into the moss provided for the purpose.

In 1882, I was prevented from looking into their cage until the 1st of April, when I saw some specimens had already been out some time, as three or four were dead and much shattered; after this, on the 3rd, a male and two females emerged, and another female on the 8th: three pupæ remained over until the present year, 1883, when, on April 12th, a male was bred, followed on the 18th by another, and on the 21st by a female, the males being much finer specimens than those of the previous year.

The egg of *versicolor* is of a good size, about 2 mm. in length, and rather more than 1 mm. wide, in shape much like that of a brick with rounded-off angles, slightly depressed on the upper-side, sometimes on both sides, the surface apparently smooth and very glossy; when first laid, it is of a light green colour, but this, in the course of a few days, changes to dark brownish-purple, much the colour of a fresh birch twig, which lasts for about fifteen days, and then assumes a purplish-violet tint, gleaming like an amethyst, and the interior seems a little cloudy; a few hours later, it is fainter and pinkish, and then the larva soon hatches. The empty shell, with the circular hole of egress at one end, still retains a faint tinge of pinkish-violet after the larva has escaped.

On leaving the egg-shell, the larva is a stout and robust creature of cylindrical figure, the head, as usual at this time, the largest segment,

is of a dull black colour, with greenish mouth ; the body velvety-black, with a dingy olive-greenish plate on the second segment, having a wide black dorsal division ; on the other segments, are olivaceous greenish-yellow tubercular warts, each anterior pair on the back being distinctly larger than the others, which are very minute, all bearing a few weak soft yellowish hairs ; a black dorsal blunt projection is on the twelfth segment ; the anal plate and outer sides of the anal legs are pale olive-greenish-yellow ; the ventral legs are blackish on the outside with greenish innerside, the anterior legs olivaceous yellow and shining. From the first, they at intervals fed on two particular leaves near the top of the birch spray whereon they had all assembled, holding to the twig by their ventral and anal legs only, the fore-part of each body being bent back away from the twig, leaving the anterior legs free ; by the fourth day, their colouring had become dingy blackish-olive, with the mouth orange-ochreous, a blackish dorsal line, black tubercular spots, a conical hump on the twelfth segment, a faintly paler spiracular ridge on the thoracic region, and the anterior legs pale orange, with black bases.

After the first moult, the ground-colour is of a subdued green, thickly freckled with black atoms ; the head and plate on second segment paler, of sober greenish-yellow, as are also the spiracular ridge on the thoracic segments, and a green backward-slanting stripe on the side of each of the others, and this is still paler and yellower on the eleventh and the twelfth, on which last a stripe begins at the top of the blunt eminence ; the anal flap is margined with the same colour ; the head is marked with two black stripes on either side ; a black dorsal line divides the front plate, and continues throughout over the hump as far as the anal flap.

After the second moult, they were an inch long, and then broke up their society and separated for independent existence, yet were sufficiently amiable, whenever they chanced to find themselves near each other, to agree perfectly well at any time ; while resting, they still elevated the front part of their bodies as when younger ; at this stage, the colour of the back is much lighter green, the dorsal line dark green, except at the apex of the hump, where it is black ; the sides are of a fuller green finely dotted with black ; on the back, the dots show greenish, though they have become nearly obsolete there ; the stripes on the head are alternately whitish-yellow and dark green, and on the thoracic segments the whitish spiracular ridge is conspicuous, as also on the other segments are the side stripes of yellowish-white bordered above with deep green, and these also now not only reach

the segmental division in their downward slant, but cross it, and are thence continued narrowly and obscurely below on the segment following.

After the third moult, their growth was quick, two days' feeding increased the length from 1 inch 3 lines to 1 inch $4\frac{1}{2}$ lines, with greater stoutness also in proportion, the thoracic segments decidedly tapering to the small head ; the relative colouring much as before, paler whitish-yellow-green on the back, with deeper green dorsal line, black at top of the prolonged hump, which is now seen to be slightly divided into two blunt points ; the yellowish side-stripes margined both above and below with deep green, and the sides below them of still deeper green, irrorated with fine black dots, except just where the attenuated continuations of the side-stripes can be traced ; the bases of the anterior legs black.

After the fourth and last moult, their docile behaviour continued to be remarkable, as they showed no disinclination to be handled, but grew quite lethargic, often sleeping side by side contentedly like so many fat pigs ; but when awake, they made good use of their time, consuming a great quantity of birch, and their growth was commensurate, for, by 26th of June, some were 2 inches 3 lines in length, others, later, as much as 2 inches 7 lines, and bulky in proportion ; the head very small, with the thoracic segments rapidly tapering to it, and retractile as in *Chærocampa*, though to a less extent. The middle of the body is rather the thickest, and the twelfth segment, with its humped elevation bluntly pointed and slightly divided, slopes backward at an angle to the anal flap ; the ventral and anal legs are developed much after the fashion of *Smerinthus* ; the other segments are lightly sub-divided into four nearly equal portions by slight wrinkles, the segmental divisions more strongly defined, especially on the belly ; the skin is soft and smooth, glistening on the head, which is green, and has two whitish or yellowish-white stripes beginning on either side, and continuing to the end of the thoracic segments, the uppermost as a sub-dorsal, and the lower as an inflated spiracular stripe ; the back is pale opaque green, slightly inclining to yellowish in the lightest and to bluish in the deepest portions and in the dorsal line ; below the yellow stripes, which are bordered above with green, the ground colour of the sides is of a very deep and rich full green, increased in depth by the close irroration of minute black dots, and relieved by the white oval spiracles delicately outlined with black ; in front of these comes a thin line of quiet ochreous-greenish, as though a continuation of the slanting stripe from the preceding segment, more noticeable on approaching

the ventral feet, which, like the base of the anal pair, are bright crimson; the whitish-yellow stripe on the side of the eleventh segment continues downward beneath the spiracle on the twelfth; from the top of the white horn-like lump, which is divided by a thin line of black, a whitish stripe descends on either side in a slight backward curve, and the anal flap is margined with yellowish; the anterior legs are pale green, sometimes tipped with red, and with a black hook.

When full fed, all the green colours of the larva change to brown, and it becomes restless until it finds the moss and leaves needful for its retirement and the construction of its cocoon.

The cocoon varies in length from 1 inch 4 lines to 1 inch 7 lines, and is of long-elliptical shape, being from 6 to 8 lines in width; it is composed of an open-worked reticulation of coarse black or black-brown silk threads, with round or broad oval interstices; the fabric is extremely strong, tough and elastic, covered externally with moss and birch leaves firmly adherent. About a week or ten days before the time of emergence, the cocoon is pushed by the enclosed pupa from a prone to a vertical position, the upper end is ruptured, and the pupa protrudes its head through the opening and continues by degrees to advance, until it is exposed as far as the end of the wing-covers; fixed in this position, it remains quiet a longer or shorter time until the insect is able to escape, though in two or three instances the pupa had worked itself out entirely free from the cocoon before the moth could be disclosed; on examination, the pupa could be seen to be well furnished with means for facilitating such movements, as described below.

The pupa itself measures in the male a length of 12 to 14 or 15 lines, in the female from 17 to 18 lines, or occasionally a little more; it is very stout, the diameter across the bulkiest part at the end of the wing-covers in the male, ranges from 4 to $4\frac{1}{2}$ lines, in the female, 6 lines; the head has the mouth-parts a little produced in a squarish form, flanked by the curved antenna-cases in high relief; from thence the head is bluntly rounded above in an unbroken swelling curved outline to the end of the wing-covers, including the thorax and upper abdominal rings; the moveable abdominal ring is very deeply cut, and those below are well defined, the last ring ending with a prolonged flattened caudal process tapering a little to the squarish extremity, where it has a margin of hooks and bristles; the surface is remarkably dull, and rough everywhere, except in the divisions between the moveable rings, yet even there it is quite dull; the roughness on the head, thorax, upper rings and wing covers is striated, granulous, or

wrinkled ; the moveable and lower rings of the abdomen have on the back transverse rows of stout and sharp hooks pointing behind ; the colour is a sooty or dingy brown, black in the abdominal divisions.

Emsworth : *June 18th*, 1883.

NATURAL HISTORY OF *BANKIA BANKIANA*.

BY WILLIAM BUCKLER.

This pretty and active little *Noctua*, of which nothing had been heard for a long interval of time, was last season re-discovered by Mr. G. H. Raynor, who found it in some abundance near Ely, and succeeded in obtaining a good number of eggs, and most kindly sent a liberal supply of them to my friend the Rev. J. Hellins and myself ; those I received, were laid within a glass-topped box, to which they adhered, as well on the glass as on the paper, being sprinkled over both surfaces singly, with occasionally two together.

The eggs arrived on 7th of June, 1882, and began to hatch on the 9th, while yet the exact nature of the proper food-plant for the larvæ seemed somewhat uncertain ; a low plant had indeed been suggested to me by Mr. Raynor for trial, since although Guénée had distinctly stated *grasses* to be the food, he had not mentioned any particular species of grass ; I soon found, however, the low plants refused, and then tried a small *Carex* ; they fed a little on this and on coarse grasses, but the little larvæ began to die off ; when, fortunately, before all had hatched out and died, it was found that *Poa annua*, a common grass growing almost everywhere, was quite to their taste, and the fact was at once kindly imparted to me both by Mr. Hellins and Mr. Raynor.

The larvæ thrive very well on the *Poa* up to the third week in July, when, as often happens with this grass indoors, it was attacked by mould, which caused the death of almost all my larvæ ; however, Mr. Hellins most kindly sent me several of his, which had been kept in the open air, so that I was able to continue my observations until the end of the month, when the larvæ reached full growth.

I kept my pupæ alive through the winter, but suppose I mis-managed them during the month of May, 1883, by keeping them too much exposed to rain, as I bred only one specimen, a male, on 29th of last June.

The egg of *bankiana* is globular in shape, with a slight depression at the base, about $\frac{1}{35}$ " in width, and $\frac{1}{30}$ " in height, with about

thirty-four shallow ribs, and with shallower transverse reticulations; the central space in the top is flat with large shallow reticulations; the shell has a pearly sheen; when first laid, it was said to be of a dull whitish, having the faintest greenish tinge, and then gradually turned to a pale greenish-yellow.

When first hatched, the larva has the ventral legs developed on the ninth and tenth segments, and a small undeveloped pair on the eighth; it is of pale yellowish-green colour, with very fine black dots and hairs. After feeding a few hours, the interior became deeply tinged with dark green, which showed strongly through the clear skin, especially in the middle of the body; when eight days old, the skin became less clear, and of a uniform light yellowish-green with blackish tubercular dots.

In twelve or thirteen days, they moulted the first time, and became less transparent than before; and after the second moult, in five or six days' time, they were long and slender, and of a more opaque velvety green, and faintly showed subdorsal lines of paler green.

After another week, the third moult occurred, when the ground-colour was a little fresher than before, the head very pale green, and a dorsal line of darker green than the ground showed faintly here and there; the subdorsal lines were whitish-yellow, and also the segmental divisions, while the length had increased to $7\frac{1}{2}$ lines.

The fourth moult occurred on 14th of July, and by the next day they had become nine lines long, and the small undeveloped pair of legs on the eighth segment were still to be noticed; the slender proportions of the larvæ, remarkable from the first, seemed now to be even more striking as they attained full growth towards the end of the month, when they measured from eleven to twelve lines in length; they were of a very yellow-green colour, with yellow segmental folds, the round head of a light green colour with upper lip whitish, and mouth black; the dorsal line dark green though faint; the subdorsal stripe primrose-yellow; the roundish spiracles flesh-coloured, placed on the deep yellow thread-like trachea, showing faintly through the skin.

On 1st of August, one larva began to spin its cocoon just beneath the crown of the grass-roots, almost close to the surface of the earth; and others followed in the same way during the next four days, though one larva lingered two or three days longer: this was exactly an inch long as it lay stretched out, according to the habit of this species when at rest among the grass, which it matched in colour remarkably well.

The pupa is very short, stout, and dumpy, $3\frac{1}{2}$ lines in length, the thorax and wing-covers are well defined, the last rather long in pro-

portion, and from them the abdomen tapers obtusely to the tip, which is furnished with two fine points and minute curly-topped bristles; its colour at first is of a light drab, but towards May of the year following, it becomes a dark brownish-green, and is rather shining.

Emsworth: *July 24th*, 1883.

A NEW SPECIES OF *PELTASTICA*, MANNERH. (*TROGOSITIDÆ*).

BY GEORGE LEWIS, F.L.S.

This genus was formed in 1852, for the reception of an insect from Sitkha, and in 1879, Herr E. Reitter described a second species from the Amur. The type of the latter has been kindly sent to me for inspection, and I find it is specifically distinct from one I have lately taken in Japan, and which I now describe and dedicate to my friend.

P. REITTERI, *n. sp.*

Oblong, pale testaceous, rather shining, club of antennæ pitchy, head between the eyes, and disc of thorax, black. The thorax is transverse, rounded, and much dilated at the sides, where it is closely and deeply punctured: the disc is rough and irregular, with ill-defined tubercles. The front of the head, anterior and lateral margins of the thoracic disc, and legs, are reddish. The elytra are deeply punctured in regular rows, with the suture and four lines of costæ elevated, having tubercles more or less distinct. The tubercles are black, with several spaces between them, less raised, whitish. Beneath, pitchy-black. Length, 2 lines.

It differs from *amurensis* in being rather less elongate, proportionally broader and more convex. The convexity is most conspicuous in the region of the elytra, and the punctuation of the thorax at the sides, where it is pale and dilated, is close, not scattered as in *amurensis*. The sides of the thorax are also more rounded, and the basal angles less broken in outline.

Suyama, Nikko, and Fukui are localities for it, where it is not rare in May and June at fermenting sap in forests of fair elevation, and I have taken it as late as August.

Wimbledon: *11th July*, 1883.

SOME FRIENDLY REMARKS ON MR. BUCKTON'S STANDARD WORK ON THE BRITISH *APHIDES*.

BY JULES LICHTENSTEIN.

I have just received the 4th and last volume of Mr. Buckton's splendid "Monograph of British Aphides," and cannot sufficiently praise the immense quantity of interesting observations and valuable

reflections given by the author on a subject which he, perhaps, knows better than any one.

Yet, precisely, because it is a work destined to become a classic compendium of Aphidology, I should like to prevent any misapprehension in a question on which I am not in perfect concordance of views with Mr. Buckton: viz., the migrations of *Aphides*.

Mr. Buckton says, page 72: "Whilst fully sensible of the value of much that M. Lichtenstein has written on the *Pemphiginæ* and *Phylloxerinae*, I would guard myself from a committal to some of the theories he has put forward, such as the periodic migration of *Aphides* from one food-plant to another, and particularly as to his observations that certain species feed on the leaves of the oak, and subsequently descend to the roots of grasses for hibernation."

Certainly there is an error, as I only spoke (and, precisely, in the Ent. Mo. Mag.) of the gall-lice of the elm, not of the oak, and as the late observations of Prof. Horváth, in Budapest, have put beyond doubt the migration of the maize-root louse to the trunks of the elms in October, I think if Mr. Buckton give a new edition of his book, he will change the word "oak" into "elm," and put in a note that since he wrote the above lines, migration of the elm-lice to maize-roots has been observed.

But, still more in the following page, 74, Mr. Buckton states that Sign. Balbiani, the strongest opponent of the migration theory, has observed the migration of the *Siphonophora millefolii*, as female, on several grasses (?) and plants, as *Cyperaceæ*, *Trifolium pratense*, &c.; but here the migration seems to find an explanation, being in reference to *Aphides* which live on *annual* plants.

Is *Achillea millefolium* an *annual* plant in Paris? Here, and in England, I believe, it is not so, and the roots of that plant last many years; so, if migration were not the rule, there were no more necessity for the *Siphonophora millefolii* to migrate to *Trifolium*, than for *Tetraneura ulmi* to migrate to maize-roots. More explanations are desired, either from Mr. Buckton or from Sign. Balbiani.

But to confirm or destroy the migration theory, how is it that the clever observer of Weycombe, who, in his first volume, speaks of Walker's idea as to the migration of the hop-blight (*Phorodon humuli*) from the hop to the plum-tree, occupies three pages of his 4th volume, 186—188, to, "the extermination of the hop-Aphis," without saying if he has tried to follow the insect from the one plant to the other, after having followed it from the leaves of the hop to the roots on which he could not breed them?

Even if he has no faith in a good result, the essay should have been attempted. As hop is not grown here, I could not make it here easily, but I tried in May, 1880, to bring the plum-tree louse (*Phorodon mahaleb*) on hop-leaves in the botanical gardens, and it lived very well on them, and acquired wings. I was not able to follow it longer.

In his work, Mr. Buckton gives *Phor. mahaleb* as a variety of *Phorodon humuli*; to me, it is the same insect at different stages of its life. Some English entomologist could easily furnish evidence for or against my hypothesis, for I repeat it is merely an hypothesis, up to this day.

These are the only faults I find in Buckton's splendid work, which is, for the present, the best book we have on *Aphides*.

Montpellier: 9th August, 1883.

Occurrence of Argynnis Euphrosyne in Sutherlandshire.—The lower part of the valley of the River Shin is sacred ground in the eyes of the Micro-Lepidopterist, for there, thirty years ago, Mr. E. C. Buxton captured *Chalybe pyrausta*. It was in the month of May, 1853, that this occurred, whilst Mr. Buxton was more intent on the pursuit of salmon than of *Micros*.

The following May (1854) he captured on the same spot *Ræsslerstammia pronubella*. Of the habits and food of this latter insect, we are still quite in the dark; but of *Chalybe* (or *Psecadia*) *pyrausta*, thanks to Baron von Noleken, we know the whole history (Ent. Ann., 1868, p. 153); it feeds on meadow-rue (*Thalictrum*) in July and August.

I first visited the valley of the Shin in June, 1872, and have since been there in July, 1882, and June, 1883, but I have not yet succeeded in detecting there any *Thalictrum*, though it is very possible that it may occur plentifully in some limited area, as often happens with plants.

It was whilst prospecting for *Thalictrum* a little below the Shin-falls on the 21st June, 1883, that I noticed some specimens of an *Argynnis* on the wing, and found, on capturing them, they were *Euphrosyne*. This being the very first time I had met with that species in Scotland, all my previous captures for more than forty years, and in many different and distant localities, having been *Selene*!

Mr. E. C. Buxton died of fever in the interior of Africa in August, 1878, but his captures of thirty years ago have still an influence upon me, and urge me from time to time to revisit the valley of the Shin, though to do so without a fishing rod is looked upon as a most incongruous proceeding by the anglers I meet with there.—H. T. STANTON, Mountsfield, Lewisham: August 11th, 1883.

Vanessa polychloros distinguished from Vanessa urticæ by a structural character.—Last Saturday, I had a visit from the celebrated Dutch Entomologist, Mr. P. C. T. Snellen, of Rotterdam, who was spending a few days with Mr. W. F. Kirby.

Talking, as we did, "de omnibus rebus et quibusdam aliis," I chanced to show, as objects of interest, the Isle of Man form of *Vanessa urticae*. This led to a remark by Mr. Kirby that some people wanted to make out that *polychloros* and *urticae* were only different forms of one species. Mr. Snellen then enquired if I was aware of the structural character by which the two insects might be recognised; on my confessing my ignorance, he pointed out that the basal half of the costa of *polychloros* shows a row of long, strong bristles, which are entirely absent in *urticae*. *Antiopa* shows similar bristles, but *Io* and *Atalanta* have none.—ID.: August 20th, 1883.

The larva of Acronycta alni—a problem for observers.—Dr. A. Speyer, in the Stettiner entomologische Zeitung, 1883, p. 419, has a chapter on this larva, which he calls "an Entomological enigma." In the earlier stages of its larval life, it is well known to have a totally different appearance from that which it presents at its last moult. The younger larvæ might readily be passed for the faeces of birds, even by a tolerably good observer, but the adult larva (blue-black spotted with dazzling yellow, with long hairs terminating in clubs) neither resembles bird's-dung nor any thing else. Has it then, from some cause unknown to us, any special protection in that form?

Dr. Speyer mentions that his friend, Dr. H. Müller of Lippstadt, had once offered a brood of the gaily-marked larva of *Cucullia lactuca*, bright yellow and black, to the numerous occupants of various ages of his chicken yard: most of the old fowls and many of the younger ones made long necks on first catching sight of the larvæ, but took no further notice; a few pecked towards them, but in such a timid, hesitating way, that they did not actually touch them; just a few actually picked up the larvæ, but speedily threw them down again and walked away; only one young and inexperienced chicken picked one up a second time after an interval of some minutes. The story is well told; but it does not say whether this last mentioned larva was eventually eaten.

I doubt whether any Entomologist has ever had the larvæ of *Acronycta alni* in such numbers, as to have tried the experiment of offering them to his poultry; but for all that, the experiment might be worth trying, and if the fowls did not eat them, he would be eventually no loser!

Another question here arises—why is it that this larva always occurs singly? Dr. Speyer says that it has never been his fate on finding one of these larvæ to succeed in finding a second in the same locality, in spite of the most careful search; this seems the more extraordinary as the larva does not conceal itself, but feeds exposed on the upper surface of the leaves. Of its polyphagous habits, Dr. Speyer can testify from his own experience, having found it on alder, birch, oak, beech, lime, cherry, raspberry, dog-rose (*Rosa canina*), and willow (*Salix alba*).—ID.

Pieris napi, L., versus *P. Melete*, Mén., and *P. megamera*, Butl.—I have just succeeded in solving this question by breeding many specimens of *Pieris Melete* from eggs laid by *Pieris napi*, or, as it is named by Mr. Butler, *Pieris megamera*. I fully anticipated this result, as was indicated in my paper read before the Entomological Society in August, 1882.

Pieris napi being a common English insect, I would suggest the experiment of breeding it in a hothouse for several generations, in order to ascertain if it is as susceptible to temperature variations under artificial, as it is in Japan under natural conditions; and in order to show that the experiment is worth a trial, I enclose the wings of two ♀, one taken in March and the other in June.—H. PRYER, Yokohama: *June 4th*, 1883.

Stridulation of Arctia caja.—Notwithstanding the stray notices scattered over entomological literature, I have been very reluctant to believe in the stridulation of this moth. At the outset, led to look for some startling musical apparatus, it was not until I began to perceive that a majority of butterflies produce distinguishable sounds by means of delicate and minute vein-striae, that I found it possible to entertain the idea; a matter rendered the more difficult, because the auditory cells in this species are so poorly developed that it was difficult to believe that the stridulation, if a fact, played any part in the insect-economy. The late Prof. Zeller remarked ("Isis," 1840, p. 228), "I have observed how one of my three newly-emerged female *Euprepia caja*, when roused up and provoked a bit, so that it was forced to crawl backwards, made an audible crackling noise. The experiment I often repeated for several days. Also, when I held its abdomen fast between my fingers, there was a crackling when it beat its wings." Pursuing the train of thought suggested by the vesicular organ in the allied *pudica*, he subsequently adds (Stett. ent. Zeit., 1867, p. 41): "I remark in a male *Caja* an oblique smooth place, almost longish-quadrangular, with a perpendicular depression in the centre that might well serve the same end as in the species of the *Lithosiidæ*;" the allusion being probably to the episternum of the meta-thorax.

A few days ago, I was enabled to renew Prof. Zeller's experience with a crippled female of *caja* that made a great rustling and crackling by jerking its crumpled wings up and down, when disturbed during the deposition of unfertilized ova. After a painstaking investigation of the matter, I myself came to the conclusion that the crackle was owing to the friction of the callosity at the base of the fore-wing on the edge of the hind-wing. (In the instance before me, a notch in the callosity caught the angle of the hinder-wing near the spurs.) I also noticed that the male *caja* links its wings for flight by passing a stout spine over a tuft of hair on the edge of the sub-costal vein of the fore-wing, which is confined by reason of an oblong lappet of hair falling down from the inner costal vein; but that the female, with less capability of aerial locomotion, has four lax bristles, replacing this single spine, which also catch in the tuft of hair, but then there is no little lappet to confine them in their place, as there is in the male. Consequently, by this adaptation, the female has a greater power of moving the wings independently of each other, than the male; and, therefore, I presume the female may have a greater facility for crackling.—A. H. SWINTON, Guildford: *July 19th*, 1883.

Grapholitha cæcana, *Schlüger* (*cæcana*, H.-S.), a *Tortrix* new to Britain.—Head pale brownish-grey. Eyes black. Face and palpi pale ochreous-grey. Apical joint of palpi slender, nearly as long as the basal, which is stout and curved upwards; middle joint ascending, curved, more than twice as long as the apical, and as stout

as the basal, being slightly thickened beyond the middle, and clothed with rough projecting scales. Antennæ brownish-grey. Thorax rather slender, ovate, brownish-grey. Anterior wings nearly three times as long as broad. Costa slightly but regularly arcuated, apex rather produced, anal angle rounded. Colour, shining brownish-grey, dusted with ochreous, particularly towards the hind margin. The costa, which is very pale grey from near the base, has about seven black geminations, the first four or five being placed very obliquely. The first streak of the 3rd gemination is much produced, and may generally be traced as a curved line across the wing to the anal angle. The second streak of this gemination also runs with the first to the anal angle, but almost from the costa it changes to a lustrous leaden-blue. The fifth gemination is much produced towards the hind-margin, its second streak being lustrous leaden-blue, and joining another blue streak which comes from the costa nearly parallel with the hind-margin. On the disc are two or three parallel, longitudinal, black lines, and another along the fold to the anal angle. Towards the hind-margin are a few short, transverse, irregular black streaks. Cilia smoky-grey. Posterior wings with the apex obtuse, slightly produced, anal angle rounded. Colour, pale grey, with long, slightly paler, cilia. Abdomen long and slender, grey. In the ♀ the posterior wings are dark brownish-grey, with paler cilia. Expands 6 lin.

The insect may be distinguished at a glance by the elongate anterior-wings, pale costa, and longitudinal black streaks, from any other British *Tortrix*. It occurred locally near Deal in the early part of July, amongst *Ononis spinosa* and *Onobrychis sativa*, and I thought at once it was something new. After exhausting all our works on the group, I showed them to Mr. H. T. Stainton, with whose kind assistance it was proved to be the above species. It is described and figured by Herrich-Schäffer in his "Systematische Bearbeitung der Schmetterlinge von Europa" (iv, p. 253), 257. He places it in his sub-genus, XXIX *Grapholitha*, Tr., Dup., which includes such insects as *Stigmonota Leplastriana*, *Catoptria microgrammana*, *C. albersana*, *Semasia Wæberana*, *Opadia funebrana*, *Endopisa nigricana*, &c. By Heinemann it is mentioned ("Die Schmetterlinge Deutschlands und der Schweiz," 2, 180) as occurring among *Ononis spinosa*. In Staudinger's "Catalog der Lepidopteren, &c," it stands under the genus *Grapholitha*, Tr., section *D. Semasia*, H.-S., in company with *Catoptria citrana*, *C. Wimmerana*, *C. hypericana*, *Stigmonota coniferana*, *Coccyx strobilana*, &c. The *Grapholitha* of these continental authors seems to include a miscellaneous selection from *Coccyx*, Tr., *Stigmonota*, Gn., *Catoptria*, Gn., *Endopisa*, Gn., and *Carpocapsa*, Tr.

From *Grapholitha*, Stephens, it is excluded by the structure of the palpi and the venation of the wings. Its most natural position seems to be between *Endopisa*, Gn., and *Stigmonota*, Gn., resembling the latter genus closely in the structure of the palpi. This, however, is but a crude opinion, and I should be glad to hear some older authority on the subject. Nothing certain seems to be known about the larva: *Ononis spinosa* and *Onobrychis sativa* being mentioned as probable food-plants. On the continent, it occurs in May and June near Jena, Vienna, and Wiesbaden, also in Hungary, Andalusia, and Southern Russia.—GEO. COVERDALE, 24, Fleming Road, Lorrimore Square, S.E. : August 6th, 1883.

Note on Eudorea murana.—This insect is intended to sit on rocks and stone walls, with which its colour well assimilates. In the larval state it feeds in the moss

which grows in the crevices or on the faces of the rocks and stone walls; now this moss is more or less of a green colour, and when *Eudorea murana* first emerges from the pupa state, it reposes for some time after its wings are fully grown on the surface of the green moss.

In such a position, it is readily seen by even an inexperienced Entomologist, and I should imagine, unless it is nauseous to the taste, it would be readily eaten by many insectivorous birds, for its grey colour, so like that of the rocks, &c., makes it very conspicuous on a patch of green moss, and its instinct is not yet sufficiently developed to teach it to seek *as soon as possible* the concealment of a stone-coloured object on which to rest.

At Lairg, Sutherlandshire, this insect made its first appearance on the 21st of June, and on the following day I met with several. Those I first captured, I at once placed in the killing bottle, but found I had been too hasty in so doing, as the specimens were difficult to set out, owing to the wings, though fully grown, having been still rather limp.

Hence the following moral may be deduced: if you find any species of *Eudorea* reposing on the surface of moss, keep it for some hours after boxing it before placing it in the killing bottle, that the wings may have time to harden.—H. T. STANTON, Mountsfield, Lewisham: August, 1883.

Abundance of Plusia gamma at Deal.—The appearance of this insect in great abundance this spring, and its remarkably pale form, seems to corroborate Mr. Barrett's remarks as to its probable immigration.

These insects, when taken in the spring, were of a pale slate colour, especially beyond the middle of the primary wings, and very unlike the ordinary form. The second brood, which is now equally abundant, is of a very dark colour and reddish-purple on the inner margin; they still continue to swarm at dusk on the flowers of *Ballota nigra* and the different species of *Silene*. *Vanessa cardui* was also very plentiful in the spring, but seems scarcer since the hibernated specimens have been replaced by those newly emerged; perhaps that is accounted for by the very bad weather in July, many species generally complete pests in this part of the coast, as *A. Galathea*, *P. Corydon*, &c., being much diminished in their numbers.—C. HALL, Deal: August 19th, 1883.

Coleoptera in the New Forest.—I spent a week at Brockenhurst in June last with the intention more particularly of working the wood-feeding *Coleoptera*, but owing to the absence of dead wood and the badness of the weather, my success was not commensurate with my, perhaps rather sanguine, expectations. Insects of all Orders, not excepting even the generally common species, were remarkably scarce. The following may be reckoned as my best captures:—*Mycetoporus lucidus*, *Stenus Kiesenwetteri*, *Phlæocharis subtilissima*, *Euplectus punctatus*, *Scydmaenus exilis*, *Agathidium nigrinum*, *Plegaderus dissectus*, *Cryptarcha strigata*, *Cerylon angustum*, *Læmophlæus duplicatus*, *Corymbites metallicus*, *Tillus elongatus*, *Conipora orbiculata*, *Sphindus dubius*, *Mycetochares bipustulata*, *Salpingus ater*, *Anisoxya fuscula*, *Abdera bifasciata*, *Apion genistæ*, *Leptura scutellaris*.

I spent part of one day at Lymington, where the only captures worth recording

were:—*Tachys scutellaris*, *Bledius unicornis*, *Trogophlæus halophilus*, *Micralymma brevipenne*, and *Otiorkhynchus ambiguus*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham : August 16th, 1883.

Diglossa mersa, &c., at Weymouth.—During a short visit to Weymouth in June last, on my way to the New Forest, I captured the following amongst many other species of *Coleoptera*: *Aepus Robini*, *Phytosus balticus*, *P. spinifer*, *Diglossa mersa*, *Micralymma brevipenne*, *Otiorkhynchus ambiguus*, and *Rhinocyllus latirostris*. The dearth of insect-life was quite extraordinary, the only thing that appeared in any abundance being *Homophlus armeriæ*, of which local species I could readily have taken thousands, had I felt so disposed.—ID.

Aradus corticalis in the New Forest.—On a fungus-grown beech stump near Brockenhurst, in June last, I found a few specimens of *Aradus corticalis*, both young and mature. This species seems to be very scarce; for although I diligently searched a great number of similar stumps in the same neighbourhood and in other parts of the Forest, my labour was, with the above-named exception, entirely unrewarded.—ID.

A rain of water bugs.—It is known that in Mexico, aquatic *Hemiptera* of the genus *Corisa* are so abundant, that a kind of bread is made of their eggs. If, in the Old World, these insects are much less numerous, they may, nevertheless, be occasionally met with in great abundance under certain circumstances. Thus, in a letter recently received from Captain Balassoglo, I find the following interesting details:

"During a storm near Fort Irguis (Turkistan) the *Corisa*, of which I forward examples, fell from the air in thousands, like rain; they extinguished the fire prepared for cooking my meal; in effect, there was an inundation of *Corisa*, and my travelling carriage was filled with them."

The *Corisa* in question is *assimilis*, Fieber.—A. PUTON (translated from the "Revue d'Entomologie," vol. i, p. 23).

Hymenoptera in Hayling Island.—During the last three weeks I have been staying at South Hayling, and although the season has not, so far as I have been able to judge, been a very favourable one for Aculeate *Hymenoptera*, still I have taken several species which I think are worth recording, and amongst them I am glad to be able to add a new species of *Pompilus* to our British list, viz., *Pompilus unguicularis*, Thoms., of which I have taken several males and one female; the male I have taken before both at Chobham and Deal, but without finding the other sex, and I had failed to recognise to what species it belonged.

The fauna of this little Island, at least as far as the *Hymenoptera* are concerned, seems to be a curious one, a good many species being represented, but unusually few occurring in any abundance. In the genus *Bombus*, for instance, ten out of our fifteen British species have occurred, but only two abundantly, one of these (*lapidarius*) is common everywhere, and certainly is in most unusual abundance here, nearly every plant of *Teucrium* having one or many specimens upon it; the other

(*B. cognatus*, Steph., = *venustus*, Sm.) is not generally an abundant species, but on the *Teucrium* on the eastern front of the Island, it is common enough, but apparently local, as it hardly extends over an area of more than half a mile, and seems only to occur on the coast; our other usually very common species, viz., *hortorum*, *terrestris*, and *muscorum*, are distinctly rare, *muscorum* apparently taking the place of *cognatus* inland. Although these two species are so much alike when examined at home, yet on the wing they can be known at once by their general appearance, the black hairs of the legs and the sides of the abdomen of *muscorum*, and the deeper brighter orange band of the 2nd abdominal segment in *cognatus*, shewing as distinct characteristics.

Of the parasitic genus *Psithyrus* I have found four out of our five British species, but only one or two of each, and all males. *Prosopis dilatata*, once looked upon as such a great rarity, may be taken freely, especially in the female sex, and frequents a curious variety of flowers. I have taken it on *Euphorbia segetalis* abundantly, on *Achillea millefolium* abundantly, on *Echium vulgare* frequently, and on small yellow *Compositæ* such as *Leontodon hirtus*, *Crepis virens*, &c., occasionally. It is hard to fancy a selection of plants less alike than those given above, differing widely in colour, and belonging to three distinct natural Orders,—*Achillea*, moreover, being distinct from the other *Compositæ* which the bee frequents in its strong aromatic smell. Five of the other British species have been found in the Island, nearly all frequenting the bramble-flowers along the coast.

In the genus *Halictus*, sixteen of our British species have appeared, and amongst them two of our rarest, viz., *H. brevicornis*, Schenck, and *H. breviceps*, E. S. Of the genus *Pompilus*, I have found six species, two of which are rarities, viz., *unguicularis* and *consobrinus*; *unguicularis* occurring only on the sand hills on the east of the Island, *consobrinus* only on those of the west; the common *plumbeus* occurs on both and in great numbers; of *rufipes*, I have found a very few on thistles to the east, and of *viaticus*, usually so common, I have only found two females. Only one ant of any rarity has occurred to me, viz., *Leptothorax unifasciata*, of which I found a colony under a stone on the green towards the west, it contained about seven females, at least I was able to capture that number, but others might have escaped among the stones, and about thirty or more workers, and a good many larvæ. The following is the list of my better captures:—

Leptothorax unifasciata, Latr., under a stone.

Mutilla ephippium, Fab., on the sandhills to the east of the Island.

Pompilus rufipes, Lin., on thistle heads.

„ *consobrinus*, Dahlb., on sandhills west of the Island.

„ *unguicularis*, Thoms., on sandhills east of the Island.

Ammophila lutaria, Fab., on sandhills east of the Island.

Nysson dimidiatus, Jur., a single specimen on a bank.

Vespa sylvestris, Scop., frequent on *Scrophularia*. I have taken it on the same plant at Chobham.

Odynerus 3-marginatus, Zett., frequent on thistle-heads.

Prosopis dilatata, Kirb., on various flowers.

„ *confusa*, Nyl., on *Rubus*.

Halictus zonulus, Sm., ♂, on *Centaurea*.

„ *brevicornis*, Schenck, ♂, on thistle-heads, very local.

Halictus breviceps, E. Saund., ♀, on *Echium*, &c.

„ *punctatissimus*, Schenck, ♀, on sandhills, east.

„ *leucopus*, Kirb., ♂ ♀, on thistle heads, &c.

Andrena Gwynana, Kirb., on sandhills, east, var. *bicolor*.

Cilissa tricolor, Leach, ♂, on sandhills, east.

Epeolus productus, Thoms., on sandhills, east and west.

Osmia fulviventris, Kirb., on thistle heads.

Bombus cognatus, Steph., = *venustus*, Sm., common on *Teucrium* on the beach.

EDWARD SAUNDERS, Lloyd's, E.C.: 17th August, 1883.

An extraordinary flight of dragon flies.—Prof. Alfred Newton, writing in “Nature” for July 19th, 1883 (vol. xxviii, p. 271) gives the following account of a flight of *Libellula quadrimaculata*, according to the observations of an English gentleman at Malmö in Sweden:—

“On Sunday, June 24th, we had an extraordinary flight of *L. quadrimaculata*, Linn. They passed over, or through, the town or neighbourhood for about half an hour in the afternoon. The next day they re-appeared for more than an hour; but on Tuesday, the 26th, at 7.30 a.m., they again began in millions, and, notwithstanding the wind had shifted to the south during the night, they held the same course from north-west by west, heading south-east by east. The streets, shipping, and every place, were full of them. They did not fly very high, and seemed to avoid going into open doors and windows. Some hundred or so alighted on the gooseberry bushes, apple and pear trees in the garden, but never touched the fruit: I observed one sitting on the dead tip of an apple twig, and pushed it off with my stick *thirteen* times, the insect returning each time after flying away five or six yards. The flight ended that night about 8 p.m., having been incessant for more than twelve hours. On the 27th they appeared again about noon, flying the same course, but in much reduced forces. Each day since I have seen a few, but very few. The papers say they were observed in all southern and central Sweden and in many places in Denmark, and they swarmed about the ships on the Sound. With their disappearance came the hot weather.”

[*L. quadrimaculata* occurs over Europe, Northern Asia, Japan, and North America. Migratory swarms of it have often been observed and recorded, but those above noticed appear to have been extraordinary. I am not aware if such swarms have ever been noticed in this country. It would certainly have been very extraordinary had they been found to eat fruit.—R. McL.]

Scutigera (Cermatia) coleoptrata near Aberdeen.—Though I can hardly claim a place in your Magazine for notes regarding *Myriopoda*, perhaps the following may be of interest to some of your readers.

Mr. MacPherson, of Haddon Street, Aberdeen, has kindly supplied me with specimens of *Scutigera (Cermatia) coleoptrata* from Stoneywork paper works, near Aberdeen. They have been established in these works for more than 25 years, and breed there freely. They are found principally in those rooms which are warm and somewhat moist; they have probably been introduced in bundles of rags from the South of Europe. I should be interested to know whether this Myriopod is found in similar situations in other parts of Europe. I have taken numerous specimens of *Lithobius variegatus*, Newp. (the only exclusively British Chilopod as yet described) very generally throughout the West of Scotland.—THOS. D. GIBSON-CARMICHAEL, Castle Craig, Dolphinton, N.B.: August 22nd, 1883.

Reviews.

THE BUTTERFLIES OF NORTH AMERICA. By W. H. EDWARDS. Second Series, Part xi. Boston: Houghton, Mifflin & Co.; London: Trübner & Co. 1883. 4to.

A very magnificent Part of this magnificent work. The three exquisite plates illustrate: (1) three species and varieties of *Pieris*, and contains about twenty figures; (2) *Limenitis Eros*, with about twenty-five figures, a pictorial complete life-history; (3) *Lemonias Nais* and *Palmerii*, with about thirty figures, also forming life-histories. The details of habits and economy are, as usual, of the fullest possible nature. Those for *Limenitis Eros* are especially interesting and singular, the habits of the larvæ of this species (which feed on willow) being extraordinary, they forming "perches" out of the artificially-stiffened mid-ribs of the leaves on which they rest, and making little packets of bits of leaf, the position of which is changed as the leaf is devoured; the object of these packets the author has failed to determine. Part xii, concluding the Second Series, is to be occupied by a revised List of North American Butterflies.

THE TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION. Parts 4—6. London: W. Satchell & Co.; Leeds: Taylor Brothers. 1882—1883. 8vo.

Three very respectable Parts, the "Transactions" of this strong and energetic "Union," have just reached us. They entirely concern the Zoology and Botany of Yorkshire, and should be of the greatest service to naturalists generally, and to those of Yorkshire in particular. Entomology is a leading feature, and consists of notes on Yorkshire *Hymenoptera* by Messrs. Bairstow, Roebuck and Wilson, and the commencement of a List of Yorkshire *Lepidoptera* by Mr. Porritt (occupying a portion of Part 5 and the whole of part 6); from this we learn that 1343 of the 2031 British species have been found in Yorkshire. This latter list has evidently been patiently compiled, and the author has apparently sought out every available source of information, both old and recent: moreover, the indications of localities are copious, perhaps sometimes too copious in the case of common species.

THE NATURAL HISTORY OF HASTINGS AND ST. LEONARDS AND THE VICINITY. First Supplement. Pp. 1—53. 1883.

In Vol. xv, p. 72 (August, 1878), of this Magazine, we had occasion to report favourably on the efforts of the energetic body of Naturalists located at Hastings and vicinity, with respect to the publication of a complete Fauna and Flora of their district. During the five years that have elapsed since the publication of their first report, they have evidently not been idle, and this "first supplement" is almost as bulky as the original. Among the contents we find an entirely new and complete List of the *Coleoptera*, compiled according to Dr. Sharp's new Catalogue. *Hymenoptera*, *Hemiptera*, *Neuroptera* and *Diptera* are also catalogued in considerable detail, and the list of wasps and bees may be regarded as tolerably complete (amongst the *Ichneumonidæ* and *Tenthredinidæ* much evidently remains to be done). About ninety additional species of *Lepidoptera* are recorded, and mostly amongst the Micros; this we regard as a favourable feature. Nearly 3560 species of insects have now been recorded from the district.

The rest of this pamphlet is occupied by subjects not Entomological, including a complete List of Birds, and quite a number of flowering plants not previously observed.

One point strikes us as tending to give these local lists more than ordinary value; this is the evident indications shown of anxiety to obtain the best information from specialists in each department. We congratulate the Naturalists of Hastings on the publication of this record of the results of five years' work.

ENTOMOLOGICAL SOCIETY OF LONDON: 6th June, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, and subsequently, Prof. WESTWOOD, M.A., F.L.S., Honorary Life-President, in the Chair.

George Coverdale, Esq., of Fleming Road, Lorrimore Square, was elected a Member.

Professor Westwood thanked the Society for electing him Life-President (a title that had only been bestowed upon the late Rev. W. Kirby in the prior history of the Society), and delivered an inaugural address, in which he succinctly treated upon the history of entomology, and commented upon the revolution occasioned by the popular adoption of the Theory of Evolution.

Mr. J. W. Slater exhibited a collection of insects (chiefly *Lepidoptera*) from Zululand, in which were interesting forms of *Acræa*, *Saturniidae*, &c.

Mr. W. F. Kirby exhibited a pupa found in a nest of *Formica nigra*, in Ayrshire, by Mr. Cameron. Baron Osten-Sacken considered it to be that of one of the *Syrphidæ*.

Mr. E. Saunders exhibited an example of *Lebia turcica*, which had been forwarded to him as having been captured near Hastings by Mr. W. H. Bennett (cf. Ent. Mo. Mag., ante p. 8).

Mr. Fitch exhibited examples of a "tick" taken from sheep at Maldon, Essex, and commented upon the supposed connection of the presence of the tick with a disease peculiar to sheep, desiring further information on the subject.

Mr. H. W. Bates read a "Supplement to the Geodephagous *Coleoptera* of Japan," in the elaboration of which the new materials obtained by Mr. George Lewis during his investigations in 1880 and 1881 were fully worked out.

Mr. Roland Trimen communicated "Descriptions of new species of South African *Rhopalocera*."

4th July, 1883.—Prof. J. O. WESTWOOD, M.A., F.L.S., Honorary Life-President, in the Chair.

A. E. Shaw, Esq., of Elgin Road, Harrow Road, was elected a Member.

Mr. McLachlan exhibited pieces of vine-roots from a vinery near Acreington, very badly infested with *Phylloxera*; broods of young had hatched on them during the short time they had been in his hands. The vines had been apparently quite healthy until recently, but were now gradually dwindling and dying.

Miss E. A. Ormerod exhibited an enormous mass of *Atherix ibis*, F., found on a branch of alder suspended over the river at Hampton Court. (This fly belongs to the family *Leptidæ*. Similar masses [to be compared to a swarm of bees] have frequently been observed. They consist entirely of dead females, and M. Perez, of Bordeaux, has recently suggested that these congregate for oviposition, and that the young larvæ fall into the water voluntarily when hatched).

Mr. Distant exhibited several species of Lantern Fly, and in connection therewith asked Mr. Champion, who had just returned from Central America, whether he had ever observed any indications of luminosity in these insects. Mr. Champion said he had often kept them alive for a long time, and on no occasion did they exhibit the slightest indication of luminosity. He also stated that he had found larvæ of some insect in the waxy secretion of *Fulgora*. Prof. Westwood suggested they were probably Lepidopterous (*cf.* Trans. Ent. Soc. Lond., 1876, p. 519, 1877, p. 433).

Dr. Sharp communicated a Revision of the *Pselaphidæ* of Japan, chiefly from the materials collected by Mr. Lewis.

Mr. Lewis read a paper on the *Lucanidæ* of Japan. This led to detailed remarks by Dr. Leithner, who has been in this country for some time engaged upon a Monograph of the Family, in the course of which he suggested that the genus *Æsalus* did not belong to the *Lucanidæ*.

Prof. Westwood read further notes on the Fig Insects of Ceylon.

Mr. Cameron communicated descriptions of sixteen new species of parasitic *Cynipidæ* from Scotland.

1st August, 1883.—The President in the Chair.

W. H. B. Fletcher, Esq., of Worthing, was elected a Member.

Mr. Billups exhibited *Pompilus spissus*, Schiödte, ♂ ♀, taken in Headley Lane, a new locality for this rare species.

Mr. H. J. Hoskings, of Brisbane, communicated a paper on Australian Bees, in which the habits, &c., of various species were noticed. *Trigona carbonaria*, and a new species of the same genus, make their nests in hollow trees, and are stingless, but when incommoded, they smear the attackers with a gummy secretion, which glues the eyelashes together, and render themselves annoying by biting the inside of the nose, &c.

Mr. Meldola read notes by Dr. Fritz Müller with regard to the behaviour of inexperienced birds in their attacks on unpalatable butterflies, and on a larva which, before pupation, forms circlelets of its spinose hairs, both above and below it, on the twig on which it is about to pupate.

Mr. H. Pryer sent notes on Japanese insects collected by a native of the country, with remarks on the large number of species identical with those found in Britain.

Entomological Collecting on a voyage in the Pacific (Resumed from Vol. xix, p. 278).—We started from Callao on February 11th, our orders being to call at the Marquesas, Tabiti, Oparo (or Rap-â), and Cook's Islands (Rarotonga, &c.), and, after calling again at Tahiti to fill up with coal, to return to Coquimbo by the middle of July, taking Pitcairn Island on the way. For nearly a month we ran before a steady trade-wind, with splendid weather and perfect temperature, very little animal life though, either in sea or air, with the exception of flying fish, which were very plentiful. "Frigate" and "Tropic" birds (*Tachypetes aquilus* and *Phaethon atherius*) were also seen in small numbers; we were not lucky enough to see a whale, although we passed right through one of the principal whaling tracts. We were all very glad to sight land once more on the 10th March, this being the Island of Fatsu-hiva, the most southerly of the Marquesas group. We anchored in "Omoa" or "Bon

Repos" Bay, an open roadstead with heavy swell and bad landing; the scenery here was exceedingly fine, reminding one not a little of Juan Fernandez: we lay about a quarter of a mile from a grand promontory (Venus Point), terminating in a vertical precipice 1900 feet high, the finest cliff I have ever seen, except that of Achill Island in the west of Ireland. We remained here until the evening of the 11th, and I went on shore twice; it is needless to say how delighted I was with my first sight of South Sea Island vegetation, such as the bread fruit, the Pandanus, the Casuarina or iron-wood, &c., &c. From the head of Omoa Bay there runs up a deep narrow valley for several miles, a perfect forest of cocoa-nut or fruit trees; a little cotton is grown here, besides taro root, &c.; the hills are mostly covered with fern, where not wooded. Of course I worked hard for insects, but did not get or even see a single beetle! the most abundant insects were dragon-flies and mosquitoes. Two species of butterflies only occurred, viz., *Danais Archippus* and *Diadema Bolina*, both plentiful. The latter is a splendid insect, the ♂ being black, with a large violet-blue blotch with a white centre in the middle of each wing; the ♀ black, more or less suffused with ferruginous, and with a large white costal spot on the fore-wings—this sex varies a good deal. I found the larvæ in abundance on a common weed, and reared a splendid series. Several species of moths were abundant, one or two being familiar Callao insects, to my surprise; the bulk of them were small *Pyralidæ*, but two or three species of day-flying *Noctuæ* occurred, among them a very pretty *Plusia*. I got a few nice fresh-water shells, which seem to be very scarce in the Marquesas. My proceedings "astonished the natives" a good deal; they were, however, most friendly and civil. They are a very fine race of people (ten times better than Peruvians), scarcely darker than Spaniards or Italians, and many of the men over six feet high; they were nearly all tattooed all over their bodies, some in really elegant patterns. We had numbers of them off to the ship in small outrigger canoes, bringing fruit, cocoa-nuts, a few cowry shells, &c. Old clothes were a great deal in demand, and I got over 100 excellent oranges and a large bunch of plantains for a very old coat.

March 12th.—Arrived in Resolution Bay (so named by Capt. Cook) in the Island of Tau-ata or Santa Christina. We did not remain here a whole day, but I managed to get a run ashore for a few hours. Unfortunately it rained nearly all the time, and I could do scarcely anything in the way of collecting. I got a good way inland, and found the natural vegetation very fine, but it was of course soaking wet: I found one or two Rhizophagoid beetles under the bark of a log of bread-fruit tree.

13th.—Left Resolution Bay at 10 a.m. for the next island, Hiva-Oa, or Dominica: at 1 p.m. we anchored in Tâa-hu-ku Bay, just under the highest summit in Hiva-Oa, or, indeed, in the Marquesas, a very grand mountain, 4130 feet in height. Behind Tâa-hu-ku, is a remarkably fine and extensive valley, terminating in a magnificent amphitheatre of wooded cliffs about two miles inland. This island is one of the principal stations of the French, who possess the Marquesas Islands. I went on shore early the next morning (14th), and had a very enjoyable ramble about the valley, but failed to get any distance up the hills. I met with the usual *Danais*, *Diadema*, and other insects, and on this occasion I got a few beetles by working at dead wood, &c. Among them were two or three specimens of a pretty *Elater*, somewhat like *Corymbites tessellatus* in aspect; one or two spp. of *Tomicus*?, *Rhizophagus* sp.? (several), *Phlæopora*, &c. One of my messmates brought me three specimens

of a remarkably fine *Brenthus*?, which he had found running on a log; it is a long, slender, blackish-brown species, with interrupted longitudinal yellow stripes on the elytra, not unlike, but much finer than, a species which I found not rarely at Panamá.

15th.—Left Taa-hu-ku for Anna Maria Bay or Taiohaie, in Nuka Hiva, the largest of the Marquesas Islands. We arrived there next day, and as we remained until the 22nd, I had a good opportunity of exploring the vicinity of the settlement, on one occasion getting up among the hills to a height of 2800 feet, where, however, I found but little different to what I met with in the low grounds, except some nice little land-shells, and two or three nice Cossonid weevils in dead wood. The general character of the vegetation here is the same as in the other islands, if anything more luxuriant; an introduced species of *Mimosa* is very abundant near the settlement, and on it the half-looper larvæ of *Achæa melicerta*, a very handsome moth allied to *Catocala*, brown with black and white hind-wings, may be found in great numbers, and are very easily reared. I added several nice moths to my collection here, among them two *Sphingidæ* (*Chærocampa erotus* and *Macrosila* sp.), a moth very like *Liparis salicis*, *Xylophasia* sp.?, a nice *Hadena* (abundant in thatch), and one or two other *Noctuæ*; *Geometræ* were very scarce, indeed, I observed only two species, a small *Boarmia* and a *Eupithecia*, in all the islands. *Pyalidæ* were very numerous as before.

The larva of a very handsome Hadenid (?) moth is abundant on cotton and tobacco, &c., and is sometimes, I am informed, so numerous as to be a great pest. Among the beetles, my best take was a very fine series of *Brenthus* sp., which I found under bark of a log of *Hibiscus*, in company with two or three of a *Cossonus*, and great numbers of very sharp-biting ants. The beetle varied immensely in size, some of the ♀s being only a quarter of an inch long, while some big long-headed, ♂s were nearly five times that length. The oceanic bug, *Halobates* sp. (?), was very abundant in all the harbours, and I caught a fine series with my long-handled net. On the whole, I think I did fairly well in the Marquesas, although insects were decidedly scarce as regards species; indeed, I do not think I took more than thirty species of *Macro-Lepidoptera* (including *Pyrales*), and even fewer *Coleoptera*. We received much attention and hospitality from the French resident in Nuka Hiva (virtually, the governor of the Marquesas); among other things, he got up a grand goat-hunt for us, to which nearly all the officers and a number of the blue jackets went. About forty half-wild goats were surrounded and driven down to the water's edge, where they were caught (not without some difficulty), and taken on board the ship. We lived chiefly on goat flesh for some weeks afterwards: it turned out by no means bad, certainly far better than salt beef, at any rate.

I think we all enjoyed our cruise among the Marquesas Islands, and were sorry to leave so soon, even for Tahiti. We passed through the north-western part of the Paumotu or Low Archipelago, and saw two or three of the islands, which are most curious: huge "atolls," or rings of coral, sometimes many miles in extent, enclosing a large lagoon of salt water, and covered with most luxuriant vegetation, although they are scarcely elevated above high-water mark. I should very much have liked to land on one of them. Tahiti was reached on March 29th, and we went inside the barrier reef and anchored off the town of Papiete, the capital of the island. We

coaled ship, and gave leave to the crew, so we managed to make out eight days here. I had heard a great deal about Tahiti, and may say that, although my expectations were raised very high, I was not in the least disappointed. The island may be said to consist of two peninsulas, each composed of a huge mass of mountains, which, in the main peninsula, or Tahiti proper, attains an elevation of 7321 feet. All round the shore is a belt of low flat land, covered with a forest of cocoa-nut and fruit trees: then come smooth steep hills, seamed with deep ravines, and covered with ferns and wild guava bushes, which latter are quite a pest, covering many square miles of country, and bearing abundance of large and delicious fruit, which, however, is seldom or never gathered, being allowed to rot on the ground in tons. Above these hills, the mountains are rugged, and broken to an extraordinary degree, and are covered with dense and most beautiful forest, composed in a large part of tree-ferns, which I have seen as much as forty feet high; wild bananas or plantains ("faës," as they are called here) also form a very large portion of the vegetation, growing in patches of many acres in extent. Papiete is a very pretty little town, or, rather, village, but it is so hidden among trees as to be scarcely visible from the anchorage. An excellent macadamized road runs all round the island (100 miles) close to the sea, and is called (why, I know not) the Broom Road. I had several very pleasant excursions on shore, on one occasion getting up into the mountain forests to a height of more than 3000 feet. Insects were a good deal more abundant than in the Marquesas, as well as in greater variety. Besides *Danaüs Archippus* and *Diadema Bolina* (the latter very large and fine), I saw and obtained at least five other butterflies, all more or less plentiful. These were, the large and handsome Satyrid, *Cyllo Leda*, which haunts shady places, and is not often taken in good order; a fine, white-spotted, black *Euplœa*; a little fulvous and brown insect, nearly related to *Argynnis*, &c., which, I think, belongs to the genus *Atella* (the pupa, which I found in plenty on broad-leaved plants in the high forest region, is the prettiest I have ever seen, being bright clear green with golden spots and streaks, and coppery-red bands across the back); lastly, two species of *Polyommatus*, one being nearly related to, perhaps identical with, our *P. baticus*. A very handsome species of *Macroglossa*, very like our British *M. stellatarum*, is common at heliotrope flowers, &c., but is very hard to obtain in good order; however, I found four larvæ, and succeeded in rearing them all to the perfect state. I heard a great deal from the residents about large Sphinges entering their houses at night, but the only one I received was unrecognisable through having flown into a glass of beer! The moths were much the same as at the Marquesas, but one or two nice fresh things turned up, mostly, however, of small size. I got a few *Coleoptera* among the higher woods, as well as a good series of a very fine species of *Clytus*, which I found in plenty running and flying about some dry logs of *Hibiscus* just outside Papiete, but on the whole this Order appeared to be but poorly represented. Some very nice land-shells (mostly small *Bulimi*) occurred to me on foliage at a considerable elevation, and I also obtained a pretty good lot of sea-shells; so that, on the whole, my stay at Tahiti was by no means unprofitable.

We left Tahiti on April 6th, for the neighbouring island of Eimeo or Moorea, twenty miles distant, and anchored in Papetoai Bay, a well sheltered and exceedingly pretty harbour. The general character of Eimeo is the same as Tahiti, but the

mountains are much more abrupt and broken, shooting up into the most fantastic peaks, one, in particular, being very like a church steeple. The vegetation is very luxuriant, and it is difficult to get about, the low ground being rather swampy, with but few paths. I found the usual Tahitian insects in plenty here, and took several hawk-moth larvæ, feeding on a species of *Convolvulus* with very large leaves. These have just produced a moth which I cannot distinguish from our *Sphinx convolvuli*, except in size, it being only about three inches across. Some very pretty land and fresh water shells, different from those found at Tahiti, occurred to me: but the mosquitoes quite spoiled the pleasure of walking in the woods, as they were more numerous than even at Acapulco or San Blas, and quite as venomous.

We left Eimeo on the afternoon of April 9th, for the remote island of Rap-á or Oparo, and thence to Cook's Islands. After a somewhat tempestuous passage, in which the wind persistently headed us, and we had to steam a good deal in consequence, we arrived at Rap-á on the 18th, and anchored in Ahurei Bay, a well sheltered harbour, but full of reefs, and with poor holding ground. Rap-á is a very pretty island, eighteen miles in circumference, and may be described as one mass of jagged and precipitous mountains, running up into remarkable needle-shaped peaks, the highest being 2172 feet in elevation. As we stayed here only twenty-four hours, I was able to get on shore only once, for a few hours, but I greatly enjoyed my brief ramble. The vegetation was not unlike that of the islands we had as yet visited, with the exception of the cocoa-nut and bread-fruit trees, which appeared to be almost, or quite, absent: on the other hand, the screw-pine (*Pandanus*) was abundant, and the tree-ferns remarkably fine. The only butterfly I saw was *Danaïs Archippus*; the moths were, for the most part, common Tahitian species, with the exception of a very fine large moth (*Ophideres* sp.), brown, with bright orange hind-wings, banded with black, of which I saw three or four specimens, and was lucky enough to catch one. A few beetles, including two or three very nice fresh species of *Cossonidæ*, and some land-shells of the genus *Helix*, completed my small collections at Rap-á. The inhabitants, about 150 in number, seemed poor, though they had no lack of food, in the shape of goats, pigs, and taro-root, with which they supplied us plentifully.

Leaving Rap-á on the 19th, and again encountering baffling winds, we arrived at Mangaia, one of the Cook Islands, on the 27th. We did not anchor here, as there is no harbour, and only stayed long enough to communicate with the shore, so I did not land. Next day, we arrived at Rarotonga, unanimously pronounced to be the prettiest island we had yet visited: it attains the elevation of 2925 feet, and is covered with most beautiful and luxuriant vegetation. There is no anchorage here, the island being surrounded by a fringing coral reef. We had to lay off and on under steam for about twenty-four hours, but I managed to get a short run on shore on the afternoon of the 28th. I found the productions, animal and vegetable, much the same as at Tahiti; a great deal of coffee and cotton are grown here. Six or seven species of butterflies turned up, viz.: *Danaïs* and *Diadema* (the ♀s of the latter very handsomely suffused with red, like the East Indian form, I believe), two of *Euplæa* (one new to me), *Cylo Leda*, and a lovely little blue-purple *Polyommatus*; no fresh moths, but about eight species of beetles, among them a nice *Hylesinus*, and several *Cossonidæ*, one of the latter very minute. Three or four species of land-shells, and about fifty sorts of sea-shells in good condition picked up on the beach, made up a very fair afternoon's work.

May 1st—Arrived at Aitutaki Island at 8 a.m.: this island is comparatively low and flat, but very pretty, with most luxuriant vegetation: no harbour, but a barrier reef all round encloses a lagoon, and there are one or two passages for boats through it. I had a forenoon on shore with pretty fair success, getting a very nice series of *Polyommatus* (two species), *Euplaea*, and some nice fresh moths. I could not, however, find any beetles or land-shells. We stayed here thirty hours, and were most hospitably received by the natives: the chiefs got up a big feast for us (to which I was, unfortunately, not able to go), and sent us off a present of 800 cocoa-nuts, 800 lbs. of yams, several pigs, a bullock, and innumerable oranges, &c. There are about 2000 people on each of the islands, Mangaia, Rarotonga, and Aitutaki, but no Europeans, except on Rarotonga. The chiefs and a good many of the natives came on board us at all these islands, they seemed very much taken with the ship.

May 3rd—Arrived at the island of Atiu (Wateoo, of Cook), at 4 p.m.: this, like Mangaia, consists of upheaved coral, with a central volcanic nucleus, and looks less fertile than most of the islands from the sea. I landed with the captain, not without difficulty (being carried on the back of a native across the reef), and walked about two miles into the interior to the principal village: here we were well received, but I had no time to look for insects, as we were off again at 6.30 p.m. I saw *Danaïs* and *Diadema*, and some common moths, that was all. A large "stick insect," *Lopaphus cocophagus*, about five inches long, is very destructive to the cocoa-nut trees in these islands.

May 9th.—Arrived at Eimeo: stayed there a day, during which I got a few things, such as a very nice *Boarmia*?, *Chærocampa erotus* (larva on taro), *Sphinx convolvuli*, a good lot of land-shells, &c.; went over to Papiete (Tahiti) next day. We have been coaling, &c., so have had no time to land; have bred some nice varieties of *Diadema Bolina* from Aitutaki larvæ. We leave at the end of next week (about 19th) for Pitcairn Island and Coquimbo, where we ought to arrive about the first week in July.—J. J. WALKER, H.M.S. "Kingfisher," at Sea (between Atiu and Tahiti): May, 1883.

The larva of Saturnia carpini with respect to its edibility by birds.—I cannot discover that any record exists of experiments with this larva respecting its edibility, or otherwise, so far as regards birds; hence the incident I am about to note may be of some interest. About ten days ago I was at Heidelberg, enjoying a walk on one of the hills near the town, under the guidance of Baron Osten-Sacken. A full-grown larva of *S. carpini* was crossing the path, and as a peacock was strutting not far off, it occurred to us to see what would happen if the larva were brought under his notice. At first he eyed the larva with indications both of doubt and curiosity. Then he seized it and, apparently, found the spines disagreeable; but, excepting the spines, everything seemed to be satisfactory, for the larva underwent a process of beating on the ground (much after the style of a thrush with a snail) for about a minute, and was then bolted.

Dr. Weismann, in his "Studies in the Theory of Descent" (Mr. Meldola's English translation), p. 338, notices that this larva was devoured by lizards, with which he experimented.—R. McLACHLAN, Lewisham: 9th August, 1883.

NATURAL HISTORY OF *PROCRIS GLOBULARIÆ*.

BY WILLIAM BUCKLER.

Before proceeding to transcribe my notes of this species, I am anxious to make a few remarks, which, while bearing on the subject in hand, have also a wider reference, and will apply to other papers, which I am hoping to pen hereafter.

After investigating the life-histories of our *Macro-Lepidoptera*, and figuring their larvæ, since 1858, I have amassed more or less satisfactory notes and figures of about 850 species, beginning with the *Diurni* and ending with the *Crambites*.

Hitherto my friends have been able to supply me with British examples, but it will be evident, from the numbers given above, that the time has come when there arises a yearly-increasing difficulty in obtaining ova or larvæ of the (comparatively) few species yet untouched; whilst the old adage "*ars longa vita brevis*" remains as true as ever; and therefore it is, that in view of these pressing reasons, and after consulting the friends, whose opinion I most rely on, I have, after some little hesitation, resolved to avail myself of continental aid.

This resolve does not lessen my desire to take my notes and figures in all possible cases from indigenous examples; in every case as before, I shall make a point of stating exactly and truthfully the source from whence my information is derived, so that there will be, I trust, no ground for complaint that I have ever attempted mystification, or added to the difficulties of the naturalists who take in hand the onerous and responsible task of settling the extent of our native fauna.

On 25th of June, 1882, I had the pleasure to receive from Herr Heinrich Disqué, of Speier, several eggs of *Procris globulariæ*, together with the parent moth herself, which he had induced to deposit her eggs in a small cylindrical box with glass ends; one egg hatched on July 10th, but the larva was killed in the effort to take it from the cylinder; on the 14th, five or six larvæ were hatched, but I was unable to extract more than two of them uninjured, as they all were much entangled with web or remains of cotton wool obstinately clinging to the box; the remaining eggs hatched next day, but most unfortunately just when my vision became disturbed from a bilious derangement, and the larvæ from them were all fatally injured in my attempts to get them out of the box, as next day with sight restored I saw them lying dead on the leaves of *Centaurea*.

I now looked for the two larvæ that had previously been safely put with a leaf of *Centaurea nigra* in a small tin box, but could discern

neither of them until I held the leaf against the light, then at once I saw them both embedded in its substance, each appearing about the size of a small flea in a semi-transparent spot between the upper and under skin of the leaf; and these spots, when afterwards vacated, became clear blotches on the surface; the larvæ on emerging to the light were seen to have grown a little, and soon made their way into a fresh piece of similar leaf, which began to show several such blotches where the parenchyma was eaten out.

On 25th of July one came out of the leaf, and next day the other, when a fresh leaf was provided, but neither would attack it, and they sat still on the old one until the 3rd and 4th of August, when, after moulting, they entered fresh leaves, which continued to be supplied to them in the box every two or three days; their second moult occurred, after they had left the leaves and sat still for nine or ten days, on 13th—14th of August, when, after an interval of rest, they again mined into the fresh leaves making numerous clear spots on their surfaces, but only for about three or four days, as they were out of their mines again on 18th, and were spinning little mats of silk, on which they fixed themselves to wait for their third moult, which happened on 23rd—27th of the month.

By 3rd of September, the one more advanced in growth than the other had laid itself up on a silken mat, spun on the upper surface of the midrib of a leaf whose sides swelling up made a desirable sheltered situation to be fixed in, while its companion at this time was to be seen in the middle of a comparatively large mined blister, from which as from the very first, the black frass continued to be extruded a day or two longer; the former accomplished its fourth moult September 12th, the latter on the 14th; the first after a three days' rest from what seemed an exhausting operation, again mined into the leaves, and after an interval its companion also, both growing a little, while making larger blister-like mines.

On 9th of October they were out of their mines, had ceased to feed, and seemed to be hibernating, and this I made sure of on the 21st, when I closely examined them and saw that each larva had its feet on a silken mat, and that one of them had a stay of a few threads passed over its back, attached to the stout midrib and to the under-side of the piece of leaf it was on; each of these pieces, already becoming discoloured, with their occupants attached, I then placed at the base of the plant of *Centaurea* from whence nearly all their food had been gathered, and which I had recently dug up and potted for their reception during winter; one being laid on a dry leaf, the other on a radical sprouting

leaf; I looked for them early in November, and saw the pieces of leaf were nearly rotten and deserted by the larvæ, they having entirely gone from view.

On 17th of February, 1883, while noticing the few large leaves on the plant which I kept in a window, I chanced to observe two small watch-pocket-like apertures cut in the upper epidermis of one of them, and two minute black atoms of frass lying near, and in course of a week these hopeful appearances were seen on more of the leaves, and began to increase in number, but all of them were very small, and it was not before the morning of the 25th that I was gratified with the welcome sight of one of the larvæ, the only one it seemed that had survived the winter thus far; it was on the upper surface of a leaf creeping deliberately along the midrib towards the footstalk; in the afternoon I could see it attached to the under-side of a neighbouring leaf; next morning after vainly looking over the plant, I found it had crawled off and was lodged on the rim of the flower-pot, a circumstance that led me to reflect on the roving disposition it had so soon betrayed, there being evidence that it had wandered all over the plant; so now, in fear of losing it, I again took it into the captivity of a box, where for a day or two it mined into a gathered leaf and ate out the parenchyma from a largish area just as it had done in autumn; then I gave it more light and air, but by 6th of March, it had made only five mines, each no bigger than itself, of irregular oval shape, and all through the remainder of this month of cold north-east wind it did not feed, but laid up as though asleep, until the 1st of April, when it removed to a fresh leaf, but without feeding, and again afterwards it moved to one or two other fresh leaves, and even made a small puncture in them, but it did not feed; on 5th of April it seemed unable to keep on its feet, appeared in a moribund state, and was dead by next morning.

I lost no time in communicating this mishap, and sending a pencil sketch of the defunct to Herr H. Disqué, who with most obliging good nature, which I am so glad now to acknowledge thankfully, at some sacrifice of time, sought out the distant spot where he had captured the insect last year, and actually succeeded in finding a larva of *globulariæ* no bigger than the little one so recently lost, an instance of keen sight faculty which astonished as much as it delighted me when I received the larva on the 2nd of May, while it was yet fixed on a leaf of *Centaurea* waiting the next moult; this was accomplished on the 9th, seemingly an exhausting process, as the larva remained quietly resting for two days and a half before beginning to feed; for two days it ate sparingly, but thenceforward more freely, making

larger blotches, until the 22nd, when it left its food to seek a suitable place to lie up in, and after being at a corner of the box for some hours it eventually moved off to another part under the lid, where, on the 24th, it spun a foot-mat of silk threads, and became fixed in them, feet uppermost, until the moult took place on the 30th; and finally it became full-fed on 11th of June, and later entered the earth.

In addition, Herr H. Disqué most kindly sent me on 6th of May, four fine larvæ, at that time a moult in advance of the foregoing, and their last moult occurred on the 18th, 19th, and 20th of the month; they all fed remarkably well, making very large and conspicuous blisters or mines in the leaves, from which they devoured the parenchyma to a great extent, even sometimes abstracting nearly the whole from a leaf; towards the last they were somewhat careless in not extruding all their frass, which could be seen in a long trail within some of the clear blisters, and they often remained within them at night and for many hours at a time, apparently asleep, when their form could be readily seen through the transparent cuticle. In this way they attacked quantities of leaves, but just at the last, and in one instance only, a larva ate a large hole quite through the entire substance of a leaf.

It may be imagined with what admiration I so often about this period perused the graphic account of the discovery of the adult larva, and its interesting habit, by the late most eminent Entomologist, Professor Zeller, in the "Entomologist's Annual" for MDCCCLXIV, pp. 103-7 (originally published more than thirty years ago), and of the great pleasure it was then giving me to be, as it seemed, verifying its perfect accuracy, and not without indulging the hope of future communication with him. Alas! too late!

Their full growth was attained from May 30th to 2nd of June, and then each in turn lingered two, three, or four days on the surface before entering the earth.

From three of the pupæ the perfect insects, two males and a female, were bred on 9th of July, having been preceded a few days by an Ichneumon from the fourth, which I have since learned from a friend has been pronounced by Mr. Bridgman to be an undescribed species of *Anomalon*.

The egg of *globulariæ* is of a long-oval shape, about $\frac{1}{40}$ " long and $\frac{1}{60}$ " wide, having at first a depression on some part of the surface, and adhering lengthway to the substance whereon laid, singly, or sometimes two or three together; the shell is very finely ribbed, and of a deep yellow colour, which changes a few hours before hatching to a dull

pinkish or to a light brownish tint, showing a deeper brown spot at one end, and by that time the egg has become very plump.

The larva, when first hatched, is of a short dumpy figure, with small black and glossy retractile head, the second segment bears a glossy brownish plate having a broad black dotted streak tapering to a point at the front, and on either side a black streak; the other segments of the body are faintly tinted with greenish drab, and covered with a short fine whitish pubescence; after seven days' feeding it re-appears fat and plump, the pubescence less noticeable, more of the skin visible and glistening as it sits still on a leaf.

After the first moult while quietly resting it appears to be a mass of bristly tubercles, and of a fresh light green colour, but by the time it has again ceased feeding and is laid up on a leaf for the next moult, the glistening skin has a greenish-buff tint, as from its plumpness the bristles are farther apart and allow this to be seen.

After the second moult it is still fresher and greener than at any time before, though when its few days of feeding in the mine have passed, and it has again laid up, it is of a deep pinkish flesh-colour.

After the third moult its colour at first is quite dark slaty-green, matching very well that of the leaves of its food plant; between the rows of tubercles down the back can be discerned a thin dingy purplish-brown dorsal line spreading a little at each segmental division; the tubercles are covered with short radiating bristles of a drab colour; but when it is again laid up it is very much lighter and the glistening skin is of an ochreous-green.

After its fourth moult, and it has fed a few days, when seen with the two front segments fully stretched out, it is $3\frac{1}{2}$ mm. in length, but later when fixed for hibernation with the two front segments retracted, it appears not longer than 3 mm., its figure a broad oval, like that of a small hemp-seed, and it is covered with closely-set bristly tubercles and a few longer fine hairs; three rows of tubercles are on either side of the body in a longitudinal direction, so that six tubercles of broad oval shape surround each segment except on the belly, which is naked; between the two which occupy the back of a segment is a black arrow-head mark; these dorsal tubercles are very dark dingy brownish-green with yellowish-green outer edges along the subdorsal region, relieved by a fine blackish line beneath; the dusky bristles make the general colouring intensely dark on the upper surface, the smooth belly and legs being of greenish-drab colour.

After hibernation, just at first, the larva appears almost black, but

after feeding a little its dark green colour becomes fresher, and the outer margins of the dorsal tubercles more conspicuously yellowish-green.

Immediately after the next moult it seems to be thickly enveloped with radiating bristles of a tender bluish-green, mixed with whitish as it sits to recover strength, and as soon as it recommences feeding its growth quickly brings the length of 10mm. and a more lively colouring; the bluish-green dorsal tubercles are strikingly defined by a creamy-white subdorsal stripe on which their outer margins encroach a little, a widish stripe of dark green follows, contrasting with the lighter green tubercles and skin below.

After the last moult, full growth being attained, when stretched out the larva measures from 13 to 14mm. in length, the greatest width across the middle of the body 5mm., it tapers a little at either end and is rounded off behind, and also in front when at rest with the first two segments retracted; the head is extremely small and flattened, the segments are plump and very deeply divided, the second is smooth and glossy, the tubercles are slightly raised, large, occupying nearly the length of a segment, except the lowest just above the feet which are rather smaller, in shape they are roundish ovate, the dorsal pair side by side on each segment are set close and obliquely together in front, leaving between them a small central arrow-head-like space behind at the division; the legs are rather short and well under the body, the belly flattened and smooth: in colour the head is black, the antennal papillæ greenish-white tipped with black, the second segment greenish with broad black marking or plate tapering toward the front, the tubercles on the back are of rather bluish light green, the dorsal row of markings black, the white subdorsal marking inclines to creamy-white, sometimes to yellowish-white, this is contrasted strongly below by a broadish stripe of dark green tapering towards the head and a little also to the hinder part of the body; on the smooth skin between the dorsal tubercles at the beginning of each segment, and of the white subdorsal marking are sprinkled some most minute black dots, only a few are on the white where it is broadest but they are numerous on the dark green stripe following it, the side below is entirely green including the tubercles, and the whole of them are studded thickly with short and fine blackish bristles, the spiracles black, anterior legs black, the belly and ventral legs green.

The situation of the cocoons could be detected by very slight elevations on the surface of the deep pot of earth, where, before the larvæ had buried themselves, all had been quite level, and when the

cocoons were removed, from only just below the surface, for inspection after the insects were bred, I found each was of broad oval shape about 9 lines by 7 or 8, exteriorly composed of grains of earth very firmly united to a few fibres of grass-roots, of which plenty were in the turfy soil, and served to bind all together; on removing the earthy particles I reached the inner cocoon of opaque greenish-white soft silk, yet strong and elastic, in these qualities reminding me of that of *O. potatoria*, and in the softness of its closely-woven interior of that of *B. mori*; it was 7 lines long and 3 lines wide, rounded off anteriorly, widest in the middle, and tapered to a blunt point at the posterior end.

In each instance (except one) the pupa had evidently emerged from the cocoon and travelled away from it a little distance, as I found the pupa-skins thus lying on the bare earth, and only the old larval-skin lay shrivelled up at the bottom of the deserted cocoons; but the one from whence the *Anomalon* had come still contained the pupa-skin only minus a portion of the head and thorax, which lay in fragments, so that the cavity of the pupal body had been the puparium of the parasite.

The pupa of *globulariæ* is about 13mm. in length and of moderate substance throughout, with prominent thorax, the wing-covers short, but toward their ends projecting a little free from the body, the long antenna- and leg-cases are all free from the body, and seem to be suggestive of locomotion even before disclosure of the moth, the deeply divided abdominal rings have each on the back near their beginning a transverse ridge thickly set with hooks pointing backward, the tip of abdomen rounded off in a blunt point; the colour of the head, thorax, and wing-covers is dark olive-green and very glossy, the leg-cases and abdomen are of lighter shining green and the hooks black.

Emsworth : September 12th, 1883.

Myrmeleon Erberi, Brauer, = *M. inconspicuus*, Rambur.—In the collection of Baron de Selys-Longchamps are a series of a *Myrmeleon* from Corfu (*Erber*) much like *M. formicarius*, L. (*formicalynx*, Burm.), but notably smaller; the species was described by Dr. Brauer (Verh. zool.-bot. Ges. Wien, 1867, p. 190) as *M. Erberi*. On comparing them with the types of *M. inconspicuus*, Rambur (Névroptères, p. 406), I find they are specifically identical therewith; hence Rambur's name should take priority. I possess a ♂ indicated "South of France," the same district whence Rambur believed his types were derived. These types consist of two perfect ♀ and one ♂ without head and abdomen; in the latter sex there is a conspicuous "pelote" at the base of the posterior wings. In describing the abdomen both Rambur and Brauer appear to have taken their description from the ♀, in which there are only

narrow yellow sutural rings. In the ♂ there is a large yellow anterior dorsal spot on nearly all the segments (often inconspicuous in dry examples unless brought out by the application of alcohol or benzine). In the Ann. Soc. Ent. Belg., xvi, p. 139 (1873), I stated, regarding *M. incertus*, Rambur, "probablement la femelle de l'espèce suivante" (*inconspicuus*), but Rambur distinctly states that his type of *incertus* is a ♂ without the "pelote" to the wings. I cannot now decide as to sex, for the type has lost its abdomen (there is no "pelote"), but, according to the colour of the head, I now believe *incertus* to be distinct from *inconspicuus*, and otherwise unknown to me. Hagen (Peters' Reise) thought an East African species might be identical with *inconspicuus*. Walker's *M. secretus* is closely allied to *inconspicuus*, but the head and thorax differ slightly, and the abdomen of the ♀ has the large spots which exist only in the ♂ of *inconspicuus*. Attention should also be directed to *M. irroratum*, Olivier (Eneye. Méthod.), but the description is probably too vague for identification.

In the Mediterranean district there exist quite a number of small species of *Myrmeleonidæ*, the synonymy of which remains in much confusion, and they are seldom captured in sufficient quantity, owing probably to nocturnal habits. It must have struck all entomologists who attend to these insects that the perfect insect is very seldom seen at large, although the larvæ are very abundant. In the course of my excursions I have never seen the common spotted species (*M. europæus*) at large, and the common plain-winged species (*M. formicarius*) only rarely, yet the larvæ of both abound in suitable localities.—R. McLACHLAN, Lewisham: 8th September, 1883.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Concluded from p. 61).

26. MELANOCHELIA, Rond.

Gen. ch.—Eyes bare, widely separated in both sexes; arista bare; forehead and epistome prominent; alulets with the lower scale longer than the upper; internal transverse vein of wings opposite to the termination of the second branch of the first longitudinal; (auxiliary*) anal vein shortened; abdomen of male slightly thickened at the apex, and with small sub-anal appendages.

M. RIPARIA, Fall.

The generic position of this species is very difficult to determine, and it has been placed in various genera by different authors. Meigen left it in his restricted genus *Anthomyia*, though on account of the wide separation of the eyes in both sexes, he ought to have removed it into that of *Canosia*, as he did with the closely-allied species, *A. litorea*, in which, however, the eyes of the male are more approximated. Rondani originally placed it in the genus whose name I have adopted,

* In the analytical table published at page 59, it is printed *axillary* vein by mistake.

which he formed for its reception; but in his last volume* he removed it into the genus *Limnophora* along with *A. litorea*. Haliday says† “This fly will form the type of a genus allied to *Limnophora* and *Lispa*,” but he did not make one. Schiner includes it in the genus *Myopina*, Desv., along with *M. reflexa* (*Musca myopina*, Fall.), but the latter species has very minute alulets, and properly belongs to the acalypterate division of the *Muscidæ*, in which it was placed by Meigen. This fly is not uncommon, and may often be found seated on stones in brooks and rivers. Haliday described and figured the larvæ and pupæ, which are aquatic and live among *Confervæ*, to which they adhere by means of hooks with which they are furnished.

27. CÆNOSIA, Meig.

Gen. ch.—Eyes bare, widely separated in both sexes; arista pubescent or bare; forehead unprojecting; alulets with scales of unequal sizes; abdomen of male mostly sub-cylindrical, and thickened or clubbed at the end; anal vein of wings more or less abbreviated.

Sect. 1—*Legs black.*

- | | |
|--------------------------|-----------------------------|
| 1. TRIANGULA, Fall. | 2. SOLITARIA, Zett. |
| <i>nigripes</i> ?, Macq. | <i>octosignata</i> ?, Rond. |
| 3. AGROMYZELLA, Rond. | |

Sect. 2—*Legs wholly or partly yellow.*

- | | |
|-----------------------|-----------------------|
| 4. INFANTULA, Rond. | 8. SEX-NOTATA, Meig. |
| 5. ELEGANTULA, Rond. | 9. GENUALIS, Rond. |
| 6. PALLICORNIS, Zett. | 10. GENICULATA, Fall. |
| 7. ANGULATA, Rond. | 11. VERNÆ, Fab. |
| 12. PEDELLA, Fall. | |

C. TRIANGULA, Fall.

This little species has been placed by Macquart in the genus *Limnophora*, and it possesses more of the characters of that genus than of those of *Cænasia*, with the exception of having the eyes widely separated in both sexes, for the abdomen is marked with a double row of large, triangular, or quadrate spots, whereas, in the spotted species of *Cænasia*, the spots are usually small and round or oblong. Not uncommon.

C. SOLITARIA, Zett.

This possesses very similar characters to those of *C. triangula*, the abdomen being marked in a similar manner; it differs from it, however, in being rather larger, and in having the thorax entirely of a light ash-grey colour marked with three narrow indistinct brown stripes; while, in *C. triangula*, the thorax is dark brown or black with grey shoulders, and unstriped. Rare.

C. AGROMYZELLA, Rond.

I have only seen one specimen of this species, which was in the collection of

* Dipt. Italiæ prodromus, vol. vi. † Nat. Hist. Review, July, 1857, p. 195.

the late Mr. B. Cooke, of Southport; it is characterized by the thorax and abdomen being both of an uniform black colour.

C. INFANTULA, Rond.

This pretty little species has the abdomen of the male laterally compressed, of a pale yellow colour, translucent at the base, grey at the extremity, and indistinctly marked on the second and third segments with two oblong brown spots.* The palpi are yellow with brown tips; the transverse veins of the wings are rather close together, the external one being rather nearer to the internal than to the termination of the fifth longitudinal vein; the legs with coxæ are wholly pale, with the exception of the tarsi, which are more or less nigrescent. Rare. I possess a single male, which was captured by the late Mr. Francis Walker.

C. ELEGANTULA, Rond.

This closely resembles the last, but differs by being rather larger, by having the abdomen of the male wider and flatter, the palpi entirely pale, and the transverse veins of the wings rather further apart. This species is very similar to *C. mollicula*, Fall., but may be distinguished by having the scales of the alulets larger and unequal in size, and by the abdomen of the male being without the large sub-anal appendages which are so characteristic of the latter species. Rare. I captured one male in July, 1883, near Bicester, in Oxfordshire.

C. PALLICORNIS, Zett.

This is a well-marked species, which has yellow antennæ, pale whitish palpi; the abdomen with the first two segments pale and translucent and the legs yellow. The late Mr. B. Cooke, of Southport, sent me a specimen of this fly for examination in 1875.

C. ANGULATA, Rond.

This, like all the three preceding species, has the abdomen partly pale, the first two segments being yellow and translucent; the thorax is ash-coloured and unstriped; the abdomen has the third and fourth segments grey, and is marked down the dorsum by a longitudinal sub-interrupted black stripe, and by two lateral round spots on each segment, which are very indistinct on the basal pale coloured portion. The hinder edges of all the segments are also marked by a narrow white line. The legs have all the femora grey, and all the tibiæ and tarsi yellow, with the exception of the terminal joints of the latter, which are black. The wings have both the transverse veins clouded with black. This pretty and peculiarly marked species appears to be rare. I possess a single male, which I obtained from the late Mr. F. Walker.

C. SEXNOTATA, Meig.

This may be considered the typical, as it is also the most common species in the genus. The thorax and abdomen are both grey; the former is marked with three stripes, and the latter with six spots of a brown colour; the legs are yellow, with the exception of the tarsi, which are nigrescent, and the fore femora, which are often brown or grey, especially in the females.

* These are omitted by Rondani in his description.

C. GENUALIS, Rond.

This rare species closely resembles the preceding one, from which it only differs in some minute points, one of which is that the posterior femora are blackened at their apices, somewhat in the same manner as those of *C. geniculata*, Fall., of which it is, perhaps, only a variety. The only specimen which I have seen belonged to the late Mr. B. Cooke. I have included three other species in my list, viz., *C. geniculata*, Fall., *C. verna*, Fab., and *C. pedella*, Fall., upon the authority of Walker, who records them as British in the "Insecta Britannica." I have not, however, yet seen an indigenous specimen of either species.

28. ATHERIGONA, Rond.

Gen. ch.—Eyes bare, remote in both sexes; forehead prominent; antennæ with the third joint prolonged, the arista bare, somewhat geniculated, and having the second segment a little elongated; palpi short, with dilated extremities; scales of alulets large, and unequal in size; abdomen of male short, subcylindrical, and clubbed at the end; wings with the internal transverse veins, placed near their bases, and opposite to, or in front of, the end of the first branch of the first longitudinal vein; anal vein prolonged, but not reaching the margin of the wing.

A. VARIA, Meig.

The peculiar little fly included in this genus bears some resemblance to a *Tachinid*, by the form of the head and the size of the antennæ and alulets; it is also like a *Lispa*, by the shape of the palpi; it has a yellow abdomen marked by four or six black spots. The description of *Anthomyia varia* by Walker does not apply to this species, though he makes it synonymous with the *A. varia* of Meigen. Rare.

29. MYCOPHAGA, Rond.

Cænosia, Meig., Schin.

Gen. ch.—Eyes bare, remote in both sexes, but much more so in the females than in the males; arista plumose; abdomen oblong and subcylindrical in the male, ovoid and depressed in the female; alulets with small and equal-sized scales; wings with the anal veins prolonged to the margin.

M. FUNGORUM, Deg.

This fly might be placed among the species of *Hylemyia*, if the eyes of the male were not separated by a widish space. It is the largest species in the *Cænosia* group, being often four lines or more (8 or 9 mm.) in length. The arista is furnished with long hairs; the thorax is grey with yellow shoulders; the abdomen and legs are yellow, except the tarsi, which are black. Not very common.

30. CHELISIA, Rond.

Hoplogaster, pt. Rond.*Cænusia*, Meig., Macq., Schin.

Gen. ch.—Eyes bare, remote in both sexes; arista subplumose; abdomen of males narrow, elongated, and subcylindrical, with large, projecting, sub-anal processes; alulets very small, with equal-sized scales; wings with the anal veins abbreviated.

1. MONILIS, Meig.

umbripennis, Zett.

2. MOLLICULA, Fall.

nemoralis, Meig.

C. MONILIS, Meig.

This little fly is of a brownish-grey colour, with brown wings and legs; the thorax is marked down the dorsum with a central black stripe; the abdomen of the male has also an interrupted dorsal stripe in the middle, and a number of small spots or punctures of a black colour on the sides; the sub-anal processes are furnished with two blunt projecting lobes. Rare.

C. MOLLICULA, Fall.

This species resembles *C. monilis* in general form and structure, but is very different to it in colour; having the antennæ (except at the base), abdomen, and legs all of a pale yellow colour, with the exception of the hinder portion of the abdomen in the male, which is sometimes nigrescent, and is marked with two or four black spots. The thorax is grey, and indistinctly striped; the sub-anal male appendages are very large, and furnished with a long apical style, flexed forwards under the belly; and also with two long processes or lobes, projecting backwards. Not rare.

31. SCHÆNOMYZA, Hal.

Ochtiphila, Fall., Meig.*Sciomyza*, pt. Meig.

Gen. ch.—Eyes bare, remote in both sexes; antennæ sub-erect, approximate at their bases, and divergent at their extremities, having the third joints dilated; arista bare, abdomen neither thickened, nor dilated at its extremity; scales of alulets very small and equal; wings with the internal transverse veins placed beyond the termination of the second branch of the first longitudinal veins; anal veins very short.

1. LITORELLA, Fall.

2. FASCIATA, Meig.

I have included these two little flies in my list of British *Anthomyiidae*, on the authority of the late Mr. Haliday, who found them both on the sea coast at Holywood, in Ireland.*

I shall conclude the List of British *Anthomyiidae* with an analytical arrangement of those genera which have the eyes *always more or less approximated in the males*. I have already attempted to tabulate those in which the eyes are remote in both sexes.

GENERUM ANTHOMYIDARUM DISPOSITIO.

Divisio prima, oculis in mare contiguus.

- A. Alulæ mediocres squamis inæqualibus.
- B. Femora antica maris subtus dentata7. HYDROTEA, Desv.
- BB. Femora antica maris simplices.
- C. Proboscis apice acuminata et geniculata8. DRYMEIA, Meig.
- CC. Proboscis apice mollis et plerumque dilatata.
- D. Oculi hirti.
- E. Arista plumata.
- F. Abdomen subrotundum, carinæ faciales ciliatæ1. POLIETES, Rond.
- FF. Abdomen ovale vel oblongum, carinæ faciales nudæ2. HYETODESIA, Rond.
- EE. Arista pubescens vel subnuda11. TRICHOPTHICUS, Rond.
- DD. Oculi nudi.
- G. Abdomen maculis discretis signatum.
- H. Arista plumata vel subplumata4. SPILOGASTER, Macq.
- HH. Arista pubescens vel nuda5. LIMNOPHORA, Desv.
- GG. Abdomen sine maculis discretis.
- I. Arista plumata.
- K. Alarum vena analis longa, sed marginem non attingens...
3. MYDÆA, Desv.
- KK. Vena analis margini posteriori saltem apice spurio producta...
6. HYDROPHORIA, Desv.
- II. Arista pubescens vel nuda.
- L. Tibiæ posticæ maris incurvæ10. OPHYRA, Desv.
- LL. Tibiæ posticæ maris rectæ vel subrectæ.
- M. Epistomii margines barbati9. POGONOMYIA, Rond.
- MM. Facies imberbis.
- N. Vena auxiliaris spinosa21. ACANTHIPTERA, Rond.
- NN. Vena auxiliaris inermis18. ANTHOMYIA, Meig.
- KKK. Alarum vena analis satis brevis, venaque axillaris contra apicem ejusdem incurvata.
- O. Arista plumata13. PIEZURA, Rond.
- OO. Arista pubescens vel nuda.
- P. Abdomen ovoidum et depressum..... 12. HOMALOMYIA, B.
- PP. Abdomen spatulatum, basi subangustatum...
15. CÆLOMYIA, Hal.
- PPP. Abdomen angustum, subcylindricum, et maculatum...
14. AZELIA, Desv.
- AA. Alulæ parvæ, squamis æqualibus.
- Q. Arista plumata16. HYLEMYIA, Desv.
- QQ. Arista pubescens vel nuda.
- R. Oculi hirti17. LASIOPS, Meig.
- RR. Oculi nudi.
- S. Pedes nigri.
- T. Abdomen maris subcylindricum...
19. CHORTOPHILA, Macq.
- TT. Abdomen maris, angustum, vel oblongum et depressum20. PHORBIA, Desv.
- SS. Pedes toti vel partim flavi.....22. PEGOMYIA, Desv.

NOTES ON THE MIGRATION OF *APHIDES*.

BY G. B. BUCKTON, F.R.S.

The friendly criticism on my fourth volume of British *Aphides*, by M. Lichtenstein, in the last number of the Ent. Mo. Mag. (p. 79), necessitates a few remarks from me in reply, and I may be permitted here to make them.

The subject of migration of *Aphides* is of considerable interest from a scientific, as well as from an economic point of view, and the production of well ascertained facts will at once assert their value, and eventually hold its own against all comers.

First, I will freely admit, and express regret for, a carelessness of memory, in apparently committing M. Lichtenstein to the position, that some oak-inhabiting *Aphides* descend to grass-roots in the autumn. I would gladly make the emendation he suggests, and alter the word oak-*Aphides* into elm-*Aphides*.

Again, from the context of my remarks, it may be supposed that I class *Achillea* and *Solidago* amongst annual plants. Their root-stocks are as clearly perennial in Britain as they are in France. This point does not, however, affect the main question as to what is the destination of the ova of their infesting *Aphides*. The destruction or drying up of the stems and leaves of these plants would seem to preclude their localization of winter-laid eggs in such parts. Prof. Balbiani has done well in making known the true place of oviposition of *Siphonophora millefolii*.

As far back as last November, M. Lichtenstein informed me that he had discovered the "pupiferous form" of *Tetraneura rubra* feeding underground on the roots of *Triticum caninum*, and he said that at the same time other specimens of the species were concealing themselves within the crevices of the elm-bark. He then stated, as he does also now, "that there is no doubt of it being the same insect which wanders from the elm to the grass-roots, and from the grass-roots to the elm."

It would now appear from Prof. Horváth's corroborative experiments at Buda-Pesth, that two European species of *Tetraneura* have underground habits.

In his observations, M. Lichtenstein more than once uses terms which would seem to admit that this question is yet *sub judice*. He several times describes as "my views," "my theories of migration" from plant to plant.

In unexpected phenomena it is clearly permissible to hold one's

judgment in suspension for a while, but in guarding myself through the expressions M. Lichtenstein quotes, I by no means hardily assert the unreliableness of the present published observations on migration. It is from undoubted evidence alone that theory passes into recognised fact.

Peculiar difficulties attach to experiments connected with life-habits, and it is granted to be no easy task to eliminate all sources of error in conducting them. Here we must assume that all possible precautions were taken that the "clean garden earth" contained no underground *Aphides* or their ova; and that the roots of the maize plants were previously as free from such.

The comparatively slight differences of character to be remarked between the larvæ of the *Rhizobiidæ* and other underground forms which are now known to be rather numerous, and the consequent difficulty in making a good diagnosis, render a confusion of species not unlikely.

But let us assume that the larvæ of *Tetraneura ulmi* leaving their galls have been successfully transferred to the roots of the maize plant (*Zea*), and that there they have undergone pupation, and that the imagos have, by their wing venation, &c., proved themselves to be normal forms, identical with those simultaneously producing the perfect sexes on the bark of the elm. Then are we to assume that the maize-root is necessary to the economy of this insect? I think we must answer this question in the negative.

In England and in Belgium *Tetraneura ulmi* is often common on the elm-trees. In the former country the maize is exotic, and one may say it is almost exclusively cultivated for ornament. Certain it is that in parts of Kent the insect is common, where the Indian corn is not to be found for miles round.

In June, 1877, I noticed that the elms of the neighbouring districts of Spa, in Belgium, were covered by the galls of *Tetraneura*, yet I did not mark any cultivation of *Zea* in the fields around.

It may be urged that *Gramineæ*, other than the maize, are resorted to, but if the elm-bark be selected for the nidus of the ova, the underground habit would seem to have nothing to do with winter quarters and oviposition.

I would invite the attention of some competent observer, in whose quarters *Tetraneura ulmi* is common, to search the couch-grass, *Triticum repens*, in autumn, and, if possible, to settle this point of habitat.

A similar difficulty suggests itself in the case of *Dryobius croati-*

cus, which M. Lichtenstein thinks oviposits solely (?) on the evergreen oak (*Quercus ilex*). Further, he thinks that the insect leaves the *ilex* for *Q. robur* and *Q. pubescens*, to return to the *ilex* once more. As the latter tree is not indigenous to Britain, to Sweden, and to E. Asia?, it is obvious that in these countries some other nidus is found by the insect.

I am not quite clear as to the gist of M. Lichtenstein's question upon the hop-*Aphis*. He seems to ask why, if I have given three pages on the extermination of this *Aphis*, I have not tried to follow the insect from *Humulus* to *Prunus*. He assumes, hypothetically, that *Phorodon malaheb* is simply a different stage of *P. humuli*.

I conceive that the chief part of a monograph is to gather in one the scattered observations of many, and that if there be incorporated original work, it will appear only as an adjunct, and not as a necessity.

Hitherto, I have regarded *Phorodon malaheb* as a variety of *P. humuli*, but an intelligent correspondent, who is a large cultivator of hops for the market, regards these two insects as distinct, and he states that *Prunus malaheb* and *P. spinosa* (the sloe or black thorn) are often quite absent from the grounds where the hop is grown.

In the few experiments that I have made on *Aphis rumicis* and *Aphis papaveris*, I have failed to cause the *Aphides* previously nourished on one genus of plant to change their food to that of another; and I am permitted, as relevant to this matter, to state the same negative result from observations made during the present year, by Miss E. Ormerod, who watched some hop-plants which had twined round the young suckers of the garden-plum. The hop-plants were much infested by *Aphides*; but the leaves of the plum remained free from their attack to the last.

Though these results are negative, they are good evidence, so far as they go, and they tend rather against than for the theory of periodic migration, or else they would show that these insects are distinct in species.

The processes of science are essentially tentative, that is, they are experimental. Hypothesis accordingly pushes into theory, and theory progresses into ascertained fact. No one more than my friendly critic will deny the value of the scientific *sieve* for the separation of the real fruits of observation. My foregoing remarks are offered in no captious spirit, and I know he will take them as materials for discussing a problem in entomology, to which he has lent so much interest.

Weycombe, Haslemere :
September 6th, 1883.

Description of the larva of Tortrix Lafauriana.—The full-grown larva is not very active, cylindrical, but slightly attenuated at both ends; segments distinctly divided; of a pea-green colour, with a darker green dorsal line, and yellowish-green between the segments. Spots paler than the ground colour, but rather inconspicuous; hairs moderately long, about four or five on each segment; head dull yellowish-green; jaws brown and eyes black; dorsal and anal plates of a darker green than the ground-colour, and about the ninth segment there is an ochreous-brown internal dorsal vessel; legs green.

On *Myrica gale* (bog myrtle) in June and July, drawing together three or four of the younger terminal leaves, and feeding principally on the apices of its leafy habitation.

Sometimes the larva changes to the pupa in its abode, but far more frequently it descends to the ground to spin up in moss, dead leaves and other rubbish. The pupa is black, and the moth emerges about three weeks or a month after the larva has assumed the pupal state.—E. A. ATMORE, King's Lynn: *August 13th*, 1883.

[Mr. Atmore has very kindly supplied me with larvæ of this species. From these I have reared a few very satisfactory specimens, one fine red female being the exact counterpart of my French type. Others are decidedly paler, approaching the colour of *sorbiana*. These are also smaller than the type. In the case of Mr. Atmore's larvæ, as well as of mine, the proportion of females reared is considerably over that of males.—C. G. B.]

The Isle of Man form of Vanessa urticae.—In the Ent. Mo. Mag. for this month, p. 82, Mr. Stainton alludes to "the Isle of Man form of *Vanessa urticae*." There is no Isle of Man form of *Vanessa urticae* as distinct from the ordinary British type of the species. Many years ago Mr. Birchall noticed that all the specimens taken in the island, or bred from larvæ collected there that season, were much smaller than the ordinary type of the species, and he distributed a good many of these specimens amongst British collections. This no doubt caused Newman to believe that Manx specimens were "uniformly much smaller than in England" (Newman's British Butterflies, p. 52); but although since then I have repeatedly been in the Isle of Man in different years, and have reared large numbers of *Vanessa urticae* from larvæ collected there, in the hope of getting the small form, I have never seen or heard of a specimen differing in any respect from the ordinary type. There is no doubt that in the year Mr. Birchall obtained his, the larvæ were either starved, or there was some other exceptional circumstance to account for it. Only this year, indeed, at the end of July, specimens I noticed near Douglas seemed so fine and large on the wing, that I watched them settle, solely to ascertain if they were not *polychloros*!—GEO. T. PORRITT, Huddersfield: *September 6th*, 1883.

THE BRITISH SPECIES OF *IDIOCERUS*.

BY JAMES EDWARDS.

The British species of *Idiocerus* are now fifteen in number, as against the ten enumerated in my table of the genus at page 52 of

vol. xviii of this Magazine; and I, therefore, propose in the present paper to call attention to the five additional species, and to characterize more exactly some of the species previously recorded.

The following errors in the table above mentioned should be noted, viz.: *lituratus* = *adustus*, ♀; *Heydenii* = *pæcilus*, H.-S.; and *confusus* = *albicans*, Kbm.

As it is frequently necessary to refer to the neururation of the elytra in descriptions of *Cicadina*, it is desirable that some intelligible system should be observed. The following system, based on that of Dr. J. Sahlberg, seems most convenient. The elytron is divided into *corium*, *clavus*, and *membrane*, the latter composed of the apical areas and frequently having a membranous *appendix*. The longitudinal nerves of the corium are the *brachiæ*, the simple nerve standing immediately above the claval suture, and the *cubital*, the forked nerve coming between the brachial nerve and the costa; the branches of the cubital nerve, which are generally forked at the apex, may be designated as *inner* and *outer* respectively, according to their position. The nerves forming the inner boundary of the apical areas may be conveniently termed *angular* nerves, leaving the term *transverse* to be applied to such other nerves as may occur in such a position as to warrant its application. The longitudinal nerves of the clavus are the *anal* immediately below the claval suture, and the *axillary* standing nearest the scutellum.

It is believed that our British species of *Idiocerus* are exactly characterized in the following table, but one or two of them will admit of some comment.

Id. Herrichii.—In the Catalogue of British *Hemiptera*, published by the Entomological Society of London, this is erroneously given as a synonym of *lituratus*. It is a handsome greenish-grey species, with the nerves of the elytra chequered with black and white. The whiskers of the ♂ are very conspicuous, and the pubescence on the cheeks of the ♀ is easily seen. It occurs on *Salix alba*, and is well described by Dr. J. Sahlberg.

Id. aurulentus, Kbm.—The single example of this species, taken by myself, might well be described as *vitreus*, without the white H, but Herr Paul Löw, who named it for me, says that of seven or eight examples in his collection, no two are exactly alike in point of coloration, and this is borne out by examples which I have from Dr. Puton.

With regard to *fulgidus*, *populi*, and *confusus*, as characterized below, I believe we are at last in accord with continental entomologists.

Id. albicans, Kbm.—Fieber, without reason, puts this species as a synonym of *confusus*, Flor, and most subsequent writers have followed him. It is, however, abundantly distinct.

- 1 (2) First and second apical areas of elytra sub-equal in length, *i. e.*, their bases level, or nearly so *adustus*, H.-S.
- 2 (1) First apical area much longer than second.
- 3 (4) First subapical area triangular, or 5-sided, reaching the costa... *varius*, F.
- 4 (3) " " " parallel-sided, not " " "
- 5 (6) Cheeks pubescent, more conspicuously in the ♂ *Herrichii*, Kbm.
- 6 (5) " bare.
- 7 (12) Elytra brownish, with a pale transverse band or bands.
- 8 (9) " with two pale transverse bands..... *tremulæ*, Estl.
- 9 (8) " " one " " band.
- 10 (11) First sub-apical area well defined, about one-third shorter than the second. *elegans*, Flor.
- 11 (10) First subapical area not well defined, about half as long as the second... *laminatus*, Flor.
- 12 (7) Elytra without pale transverse bands.
- 13 (18) Anal nerve standing in an oval white patch at apex.
- 14 (15) Inner cubital and brachial nerves with a short black streak reaching as far as the apex of the clavus. First transverse nerve black .. *lituratus*, Fall.
- 15 (14) Nerves chequered with black, or rust colour, and white. First transverse nerve white.
- 16 (17) Pronotum with a broad pale stripe. Face with four broad black stripes, ♂, or only two (on the frons), ♀ *pæcilus*, H.-S.
- 17 (16) Pronotal stripe not so broad, nor so well defined. Face without distinct dark stripes in either sex *tibialis*, Fieb., = *Heydenii*, Kbm.
- 18 (13) Anal nerve white at apex, but not standing in an oval white patch, or nerves entirely white.
- 19 (22) Brachial nerve with a white streak near the apex.
- 20 (21) First transverse nerve white ... *vitreus*, Fab., = *H. album*, Fieb.
- 21 (20) " " " not white..... *aurulentus*, Kbm.
- 22 (19) Brachial nerve not marked with white.
- 23 (28) Elytra green or greenish-grey, more or less tinged with reddish-brown towards the suture.
- 24 (25) Side margins of face angularly indented below the eyes. Inhabits poplars. *fulgidus*, F.
- 25 (24) " " " " at most faintly sinuate.
- 26 (27) ♂. Face and legs generally much suffused with orange-yellow. ♀. About one-sixth of visible length of ovipositor projecting. Inhabits aspen... *populi*, Lin.
- 27 (26) ♂. Without orange coloration. ♀. About one-third of visible length of ovipositor projecting. Inhabits sallow *confusus*, Flor.
- 28 (23) Elytra greenish-white, or almost milk-white. Nerves entirely white. Inhabits white poplar *albicans*, Kbm.

Swiss Cottage, Rupert Street, Norwich :

18th September, 1883.

Halesus guttatipennis, McLach., as a British insect.—This species was originally described by me in the “Trichoptera Britannica” (1865) from a ♂ example, in the late Mr. Edwin Brown’s collection, believed to have been taken in the north of England. After Mr. Brown’s death this specimen passed into the collection of the Royal Dublin Society. Nothing more was heard of *guttatipennis* as British. In 1861 Hagen (Stett. Zeit., p. 115) noticed a species of *Halesus* from Switzerland as “*mucoreus*” (Imhoff), which was subsequently (1875) renamed “*helveticus*” by Meyer-Dür. Later on (1874) Stein identified as “*guttatipennis*” an insect captured by him on the Altvater in Silesia. When writing my “Revision and Synopsis” I incorrectly retained the name “*guttatipennis*” for the Altvater species (not having had sufficient confidence in my original description, not being then able to re-examine the type, and being misled by the locality, considering a species from Silesia more likely to occur in Britain than one from Switzerland), and retained the name “*mucoreus*” for the Swiss species, which ultimately proved to be identical with the original *guttatipennis*. In the Supplement to the “Revision and Synopsis” (p. xxxix, 1880) this error was admitted, and the Altvater specimens received the specific name “*nepos*.” Still the original *guttatipennis* had received no further confirmation as British. At the recent sale of the late Mr. Benjamin Cooke’s collection I noticed a second (♀) example; no doubt he received it from the same source whence came the original male, and I think there can be no doubt as to the right of the species to a place in our list. In fact, any scruples I may have held on this point had been abandoned from the fact that a specimen had occurred in Belgium (*cf.*, Supplement, p. xxxix). But the entomologists of the northern and midland counties of England should endeavour to discover the exact locality of the species, which is probably on one of the moors of their district. *Guttatipennis* and *nepos* are very similar in general appearance, but the latter is smaller, and presents good structural differences, according to the limited material I have worked from. Both are probably autumnal, occurring in October and November, a time when most of our entomologists have ceased outdoor work, and this may account for *guttatipennis* continuing to be almost unknown as British.—R. McLACHLAN, Lewisham, September, 1883.

The larva of Plusia orichalcea.—In the month of July, 1882, in an outlying part of the Cambridgeshire Fens, eight or ten worn specimens of *Plusia orichalcea* were captured by the aid of a lamp, hovering round flowers of *Eupatorium cannabinum*; one only, the first specimen obtained, was taken flying in the afternoon sunshine. This year I had the good fortune to beat ten specimens of a larva, which, though exactly like that of *gamma*, but a little larger, produced in July nine beautiful *orichalcea*. Three others were obtained, one each by Messrs. Archer, Cross, and Raynor, of Ely, but were not reared. Of the earlier stages of the larvæ I cannot speak, as those beaten were all past, or near, their last moult. As far as I could see, their colour, size, and markings are exactly those of *P. gamma*. There are two fine white lines down the back from the third to the penultimate segment, with the dorsal vessel showing darker green between them; oblique white lateral lines on each of these segments. On the second and third segments, and on the anal segment,

there are five irregular white lines, which unite together in front, in the direction of the head. The spiracles are white and small, except the last, which is conspicuously larger than the rest. But the most striking feature of this larva is its wonderful power of extending and withdrawing the first three or four segments of its body, and reminding one of the larva of *Chaerocampa Elpenor*, or of the common earth-worm. When full-fed, the larvæ spun a flat oval pad of white silk on the side of the muslin bag in which they were reared, and thereon remained for twenty-four hours or longer, perfectly motionless, in a horse-shoe-shaped form, the head in close proximity to the tail. After this interval of rest, they proceeded to spin the rest of their cocoons, which were soon completed, being thin and transparent enough to allow of the easy observation of every movement of the larva inside. The cocoon, when finished, is oval, with the longer axis perpendicular, and the larvæ all pupated with the head upwards. They took a week to pupate, after the cocoons were completed; and remained in pupa just a fortnight, the ♀ in all cases emerging twenty-four hours sooner than the ♂. The pupa of *orichalcea* may be at once distinguished from that of *gamma*, which is wholly black, by its having the underneath part and the wing-cases of a lovely pale green, a colour which, three or four days before the perfect insects emerge, gradually changes into a dull pink, foreshadowing the colouring of the under-side of the abdomen and wings of the imago.

The habit of the larva appears to be to eat the young top-leaves of the *Eupatorium*, and work downwards. When not engaged in feeding, it rests on the under-side of a leaf, grasping the midrib.

One larva, in the course of its last moult, failed to throw off its old skin in its entirety: a narrow band of which remained in an oblique position, embracing the eighth segment, the hinder part of the seventh segment on one side, and the former part of the ninth on the other. This band, as it dried, had tightened, constricting the body, till it was only half its normal diameter, and enabling the whole of the internal structure and workings to be plainly seen. As the larva was evidently unable to extricate itself, I carefully inserted the eye of a needle beneath the ligature, and, aided by sundry energetic wriggings of the larva itself, split it asunder. The body soon resumed its usual dimensions, and the larva fed up and turned all right, and the imago emerged apparently perfect: but when I got it on the board, I found the left fore-wing, though not crippled, about one-eighth of an inch shorter than the right.

I think it is quite possible that *Plusia orichalcea* may be more widely spread than is generally supposed. The perfect insect is rarely seen, except at night; and the larva would be easily passed over as only *Pl. gamma*. I hope to be able to give a fuller account of its earlier stages another year.

I take this opportunity of correcting a slight error in Mr. Buckler's account of the larva of *Bankia argentula* in last month's Magazine, for which I am sure he is not responsible. Mr. Raynor was *not* the rediscoverer of that insect. I had taken some half-dozen, and Mr. Cross a couple, before Mr. Raynor arrived on the scene of action, and his delight at our capture was unbounded. Moreover, the insect has occurred in small numbers in Wicken Fen more than once during the last ten or twelve years.—W. WARREN, Merton Cottage, Cambridge: September 17th, 1883.

Obituary.

Edward Sheppard died on the 8th of September, after a short illness, at the age of 67. In his public capacity as Collector of Customs in the port of London, from which office he retired only two months ago, he was widely known and appreciated for his knowledge of business and his uniform courtesy, while his genial disposition and hospitality endeared him to a host of friends in private life. He was unmarried. He was a Fellow of the Linnean and Zoological Societies, a Member of the Entomological Societies of London and Stettin, and one of the eight Members of the Entomological Club. Besides his general love of Nature, he, for many years, devoted considerable attention to *Coleoptera*, of which he formed a collection; but his ardour relaxed, and for a long time he had given up active participation in entomological pursuits, yet to the last he retained an interest in Entomology and Entomologists.

Dr. Hermann Müller, of Lippstadt, died at Prad, in the Tyrol, on August 25th. All readers of Darwin's works will have realized how greatly our illustrious philosopher was assisted by the brothers (Hermann and Fritz) Müller. The fraternal partnership has now been dissolved through the death of the senior, but he leaves a son who has shown himself ready to follow in the footsteps of his father. Hermann Müller, as contrasted with his surviving brother, was probably a botanist rather than an entomologist. But his two principal works ("Die Befruchtung der Blumen," 1873, of which an English translation has appeared this year, and "Alpenblumen, ihre Befruchtung durch Insekten," 1881), belong quite as much to entomology as to botany. He opened up quite a new field of investigation in the intimate relations between insects and plants, and in connection therewith most of his vacations were devoted to excursions to the higher Alps. His investigations on the part played by insects in effecting fertilization and cross-fertilization in plants probably led him to speculations on the origin of colour in flowers. Hermann Müller belonged professionally to that great scholastic element in Germany that has produced so many thorough workers in Natural History.

The Rev. H. Harpur Crewe, M.A., Rector of Drayton Beauchamp, near Tring, died on the 7th September, after a long illness, aged 54. Although Mr. Crewe's Natural History studies neither commenced nor ended with entomology, the best years of his life were devoted to the study of British *Lepidoptera*, and especially to the difficult genus *Eupithecia*, in his investigations of which he made for himself a truly European reputation. The earliest published note by Mr. Crewe with which we are acquainted appeared in the "Zoologist" for 1848 (he would then be 19 years old), on an ornithological subject, and for a few subsequent years he continued to send notes on British Birds. In the same periodical for 1851, he appeared as a contributor of notes on British *Lepidoptera*, and in 1854 (*l. c.*, p. 4370) is a list of species of *Eupithecia* he had reared from larvæ, the first indication of attention to the branch in which he was ultimately to gain considerable distinction. In 1859 he published descriptions of the larvæ of many *Eupithecia*, and thenceforward, until quite recently, he continued to publish the results of his investigations of this genus (varied by notes on other *Lepidoptera*) in the "Zoologist," "Intelligencer," "Ento-

mologist's Annual" (1861-62-63-& 65), the "Entomologist's Monthly Magazine," &c., &c. Probably his last entomological note was the description of a new species of *Eupithecia* (*E. jasioncata*) in this Magazine, vol. xviii, p. 80 (1881). Latterly, however, for a considerable time, he was more especially devoted to Horticulture, upon which subject he was regarded as an authority, especially in connection with the smaller bulbous-rooted plants, in search of which he made more than one long journey to parts of Europe little frequented by English tourists: for some time he was Chairman of the Floral Committee of the Royal Horticultural Society.

Mr. Crewe was never robust; but, until recently, his appearance of health had so vastly improved on that which he bore in comparatively early life, that it was with considerable surprise we heard of his death.

Reviews.

LES ODONATES DU JAPON, par M. DE SÉLYS-LONGCHAMPS. Bruxelles, 1883, pp. 66, imp. 8vo. (Extracted from the Annales de la Société Entomologique de Belgique, tome xxvii, pp. 82-143).

In his introductory remarks the author states that the idea of a Monograph of the Dragon-flies of Japan was conceived (and carried into effect, in its initial stage, in MS.) in 1841, from an examination of the materials collected by Von Siebold, existing in the Leyden Museum; the number of species was then only 22. At the present time he is acquainted with 67 species. This increase is largely due to the discoveries of Englishmen, and especially to Messrs. H. Pryer, G. Lewis, and J. Milne. The Dragon-fly fauna is a mixture, in which the European and Siberian element forms one-half, the Indo-Chinese a quarter, and the remainder may be considered special. Eight species are truly palaearctic (including *Libellula quadrimaculata* and *Lestes sponsa*, which are British); six others are scarcely distinct from their European (or Siberian) representatives; and sixteen more are of a decidedly European facies. Just as occurs in *Lepidoptera*, the tendency of Japanese forms is to exceed in size their European sub-equivalents (thus *Diplax elata* is scarcely to be distinguished from *D. pedemontana*, excepting by its greatly superior size). The number of species of true European Dragon-flies rests (and seems likely so to do) at about 100. The author is of opinion that it will not be possible to record a similar number from Japan. We rather incline to a more considerable estimate. Notwithstanding the very important additions made within the last few years, it must be remembered that no entomologist specially conversant with Dragon-flies has collected in the islands, that many species are so much alike when on the wing as to deceive even the most experienced Odonatists, and that their capture is frequently difficult. Therefore, we predict that at the expiration of another forty years, more than 100 Japanese species will be known, and that the author's opinion as to the Japanese themselves playing an important part in the discovery (and working out) of new forms, will prove to have been prophetic. We have by no means heard the last of "Les Odonates du Japon."

THE ZOOLOGY OF THE VOYAGE OF H.M.S. CHALLENGER. Part XIX. REPORT ON THE PELAGIC HEMIPTERA, by F. BUCHANAN WHITE, M.D., F.L.S. London: Longmans & Co., &c., 1883. 80pp. 4to, 3 plates.

The Pelagic *Hemiptera*, which, indeed, are the only insects having a truly oceanic habitat, forming the subject of this Monograph, consist, as far as at present known, of but few species, and are referable to at most two or three genera, of which only two—*Halobates*, Eschscholtz, and *Halobatodes*, F. B. White, are here adverted to. These very remarkable insects, which are allied to the common aquatic genus *Gerris*, are quite destitute of elytra and wings, have a thorax often occupying three-fifths of the entire length of the body and very broad (the latter indicating great development of the muscles governing the necessarily excessive action of the legs); an extremely small, disproportionate abdomen (also advantageous to the conditions of their life); and an excessive length of the second and third pairs of filiform legs, this structure, as in *Gerris*, being admirably adapted for coursing over the surface of water. That some of the species can dive has been observed; it is very probable that all do so on occasion (as we have often seen *Gerris* do), otherwise it is difficult to understand how creatures of such fragile structure could survive storms. They have been found only on the sea in warm latitudes, mostly in the Atlantic, Indian, Pacific and Chinese regions, generally far from land, even as much as 500 miles distant, but sometimes comparatively near the shore.* They are gregarious, but nothing certain is known of the nature of their food. On this point, and also on the manner of their locomotion, especially as to the power of all the species to dive, their enemies and means of defence, the use of several peculiar structures, such as the ocelloid tubercles of the head, the ventral tubercle, and the tarsal process, information is desired by the author. As he says, "A special interest is attached to these animals, as being the only pelagic representatives of their class. It is true that a few other insects are marine, but they are all found in close proximity to the shore, whereas the species of *Halobates* usually, and in some cases only, occur at a considerable distance from any land. Moreover, their structure would seem to indicate that they are archaic forms of very great antiquity, and hence all that can be learned with regard to them is of very great importance."

Of the genus *Halobates* eleven species are described: 1, *H. Wüllerstorffi*,† Frauenf.; 2, *H. micans*, Esch.; 3, *H. princeps*, n. sp.; 4, *H. Streatfieldanus*, Templ.; 5, *H. sobrinus*, n. sp.; 6, *H. sericeus*, Esch.; 7, *H. germanus*, n. sp.; 8, *H. Hayanus*, n. sp.; 9, *H. proavus*, n. sp.; 10, *H. flaviventris*, Esch.; 11, *H. Frauenfeldanus*, F. B. White.

Of the genus *Halobatodes* (n. g.) four species (one doubtfully congeneric): 1, *H. lituratus*, Stål; 2, *H. histrio*, n. sp.; 3, *H. compar*, n. sp.; 4, ? *H. Stali*, A. Dohrn.

All the species, except the last mentioned, are figured by Mr. Edwin Wilson, the excellence of the illustrations being vouched for by Dr. White. The number of specimens extant in the museums of Europe or in private possession is not large, but as far as possible they have been obtained and examined. The bibliographical references are necessarily not numerous, but they have all been consulted, and the most of them are quoted *verbatim*. Altogether the subject has been well and exhaustively treated, as far as the available materials admit.

* c. f., Mr. J. J. Walker's note, p. 93 ante.

† All the specific names derived from proper names are printed without a capital initial letter—more insulso hujus ætatis.

NOTES ON *EUTHEIA CLAVATA*, REITTER,
AND *PTENIDIUM GRESSNERI*, ERICHSON, TWO SPECIES
OF COLEOPTERA NEW TO BRITAIN.

BY W. G. BLATCH.

EUTHEIA CLAVATA, Reitter.

Early in the spring of this year, I spent a single day in Sherwood Forest, where, in addition to other interesting captures, I had the good fortune to meet with a few specimens of *Eutheia clavata*, under bark of oak logs. It is a very distinct species, and easily separable from the other three British *Eutheia*. Compared with *E. scydmaenoides*, which it somewhat resembles in colour, and in having fine depressions at the base of the thorax, *E. clavata* is larger, flatter, and much less ovate, the elytra being in fact almost parallel-sided: the antennæ are lighter coloured, except the three terminal joints, which are darker (under a glass of low power, they seem quite black), and more decidedly clavate; those of the female are very elongate, being nearly one-fourth longer than those of the male, with the club less pronounced.

This species is described in Deutsch. Ent. Zeit., xxv (1881), p. 206, but Reitter does not appear to have seen the female. It seems to have occurred in Hungary, Germany, and the Central Pyrenees; M. Albert Fauvel, who kindly determined the species for me, informs me that he has a single ♂ from the environs of Luchon.

PTENIDIUM GRESSNERI, Erichson.

Amongst my New Forest captures in June last, were a few things not determined at the time when I sent my previous note (*ante*, p. 85), one, at least, of which turns out to be a species new to Britain, viz.: *Ptenidium Gressneri*, Er. I took a few specimens on a beech-stump, accompanied by *Pt. turgidum*, Thoms.

This species is described by the Rev. A. Matthews (who kindly identified my insect) in his Monograph of the *Trichopterygia*, p. 78. He there says that it is found in ants' nests, but there were no ants, so far as I could see, in or near the stump from which I obtained the beetle. Fungi were growing freely from the crevices between the bark and the wood, and it was after shaking these over the flat surface of the stump (to get *Aradus corticalis*) that I found the *Ptenidia* running about. This would seem to indicate that *P. Gressneri* (as well as its hitherto rare congener, *P. turgidum*) may be found by searching fungi in similar situations.

ON THE SYNONYMY OF CERTAIN *MICRO-LEPIDOPTERA*.

BY E. MEYRICK, B.A.

Just before leaving New Zealand, in August, for a flying visit to England, I received Mr. A. G. Butler's published reply to my corrections of his determinations (see *ante*, pp. 14, 15). As he accuses me of writing without any sound foundation, I ask leave to give the grounds for those conclusions which he disputes.

Before doing so, I take decided objection to the assumption that we are not justified in identifying descriptions as synonymous without reference to the original types. If this were so, descriptions would be superfluous. It would, in my judgment, be more correct to assert that we are not justified in identifying an insect from the type, which is liable to be misplaced, and cannot be published, but that the description is the only reliable authority; if unidentifiable, it should be quashed. That the author of a synonym should have referred his type to a different genus from that to which the species truly belongs, is only of importance in proportion as we can only rely upon his accuracy of investigation.

Respecting *Rhodaria robina*, Butl., I consider the description fairly agrees with the insect to which I attributed it, and is not capable of being referred to any other of the 200 species of *Pyræles* which I possess from Eastern Australia. Further, I had examined previously the whole collection of Dr. Lucas, who sent the specimens to Mr. Butler; it contains extremely few true *Pyræles*, all well known to me (these are comparatively scarce in the more southern latitudes, where he collects, but are abundant in the north), but this species is one, and was among those he sent to Mr. Butler, nor was there any other at all near it. Guenée's descriptions of *Endotricha pyrosalis* and *E. ignealis* are decidedly good, and both undoubtedly referable to this species, in my opinion; it varies considerably, and may well have been described twice. Walker's descriptions of *Pyrælis stilbealis* (!) and *P. docilisalis* (!) are not, in my judgment, identifiable, but I saw the types in the British Museum, and considered them identical with this species, of which I had specimens with me at the time for comparison; both are females, the sexes differing superficially, and I noted especially that no male existed in the collection under any name. Finally, I am well acquainted with the species and its limits of variation, having seen probably thousands of specimens, as it is common and widely distributed; and those which I have called ♂ and ♀ are certainly sexes of the one species. This is, without doubt, a true

Endotricha, with the characteristic neurulation, and elongate patagia of the ♂; if Mr. Butler's specimen really has the neurulation of *Botys* (*Rhodaria*) it must, of course, be distinct.

Next, as to *Conchylis* (?) *auriceps*, Butl. I noted the specimen of this placed amongst *Philobota Arabella*, Newm., in the British Museum (there were also in the same series specimens of *Phil. irruptella*, Z.), and recognised it as a species well known to me previously, but not described; but for this I should hardly have ventured to identify Mr. Butler's description. I do not know why Mr. Butler should assert that I have not examined the neurulation; I dissected specimens two years ago, in company with some 300 other species of *Ecophoridae*, and can produce my drawings of their structure. I shall certainly be indebted to any one who will define for me the differences between this species and *P. Arabella*, so as to render them capable of generic distinction. But, at any rate, the fact that veins 7 and 8 of the fore-wings are stalked would have shown at once that it was not a *Conchylis*.

The last remark will apply also to *Conchylis Thetis*, Butl. The species is a rather fine and distinct one, and I recognised it at once from the description; moreover, I saw the species in Dr. Lucas' collection, and learnt that he had sent home the sexes separately. Mr. Butler must be in error in stating that he compared this species with my descriptions before publishing it, and failed to recognise it; my first paper on the *Tortricina*, including this species under the name of *Dichelia isoscelana*, was issued in December, 1881, but I did not distribute my own copies until the issue of the second in March, 1882, when I sent them out together; so that Mr. Butler could not have received them until May at the earliest, whereas his paper was published (if I remember rightly) in February. Further, all his other species are referred to families which I had not then entered upon. He is not justified, therefore, in implying that my description was at fault, as I think he will acknowledge.

I regret the necessary length of this communication. I shall be sorry if my remarks cause any pain to Mr. Butler, against whom I have no personal feeling; and if I should find hereafter that any of my statements are founded on error, I will freely and gladly admit it.

San Francisco, U. S.:

September 7th, 1883.

Catocala fraxini near *Culross*, N.B.—The Rev. John McGregor, of Culross, has shown me a splendid specimen of *Catocala fraxini*, taken at sugar, on oak, the 22nd September, in Tullyallan Woods.—ALFRED BEAUMONT, Low Valleyfield House, Culross: October 10th, 1883.

MEYRICK'S AUSTRALIAN TORTRICIDS.

BY PROFESSOR C. H. FERNALD.

Mr. E. Meyrick has recently published several papers on the *Micro-Lepidoptera* of Australia, New Zealand, and Tasmania, in the Proceedings of the Linnean Society of New South Wales, vol. vi, and in the Transactions of the New Zealand Institute for 1882.

Before publishing, the author went to England and made a critical study of the types of Walker in the British Museum, which was necessary, if the names of that author were to be respected. He speaks of the work of Walker in much the same strain as every one else who has had occasion to review any of his work, and he is also quite severe in his strictures on the work of Mr. Butler.

Mr. Meyrick had the great kindness to send me a series of his types of the Tortricids, representing most of the genera and a considerable number of the species, else I could not have undertaken a review of this point of his work.

So far as I can judge, he has adopted the Tortricid group as restricted by Lederer and Heinemann, but regards it of higher than family rank, and divides it into three families. My own studies have led me to regard it of family rank only, and what he has given as families I have considered sub-families. (See my Catalogue of the N. A. *Tortricidæ*, Trans. Am. Ent. Soc., vol. x.) Perhaps he is right, but entomologists are not as yet agreed on the rank of certain groups of the *Lepidoptera*. Lord Walsingham, in "Papilio," vol. ii, p. 77, discusses the value of the group *Tineina*, and expresses the firm belief that it is only of family rank, and that we should use the term *Tineidæ* for it. Surely, the Tortricids cannot form a group of higher rank than these, if as high.

Mr. Meyrick found it necessary to create twenty new genera in his family *Tortricidæ*; twelve in his *Grapholithidæ*; and six in his *Conchylidæ*. Later, he suppressed his genus *Cryptotila*, which was founded on characters existing in the female only. I should not be surprised if he found good reason, upon the study of further material, to re-establish this genus for the species which he placed under it.

I was at first entirely unwilling to believe that so many new genera could exist in nature, in the territory mentioned, but when I had given the insects a critical examination, I became convinced that we have to deal with a Tortricidian fauna, as distinct and diverse from other parts of the world as is the mammalian fauna of that country.

I certainly agree with the author in regard to most of the genera,

but of some I had no examples for examination, and, therefore, cannot express an opinion on them. Some have been separated on the differences occurring in the origin of veins 3 and 4, and also 6 and 7 of the hind-wings. In some North American species, there is so much variation in the origin of these veins, that it would not be safe to establish a genus until a large number of individuals had been examined, and the question settled whether the venation in that species was variable or not. Mr. Meyrick may have done this, and in that case his genera will, without doubt, be retained. In some cases genera have been separated on slight palpal differences, the desirability of which is doubtful.

Of the European genera of Tortricids, only representatives of *Capua*, Steph., *Dichelia*, Guen., *Cacöecia*, Hüb., *Tortrix*, Linn., *Antithesia*, Steph., *Penthina*, Tr., *Eudemis*, Hüb., *Aphelia* = *Bactra*, Steph., *Stigmonota*, Guen., *Carpocapsa*, Tr., and *Crocidosema*, Zell., have thus far been found.

There hardly seems to be good reason for the use of the two names *Antithesia* and *Penthina*. The latter name was first proposed by Treitschke, in 1829, with *salicana*, S. V., and several other species following. In 1830, the same author characterized this genus and enlarged it, putting *Revayana* the first under it, but he does not specify any particular one as the type. *Revayana* has since been removed, and put into the genus *Sarrothripa*, and *salicana* has been taken as the type of *Penthina*, which, I think, is correct.

The name *Antithesia*, was first proposed by Stephens, in 1829, in his "Systematic Catalogue of British Insects," with the type *corticana*, and in his "Illustrations," 1834, where he characterized the genus, he suppressed the name *Penthina*, not because of the priority of *Antithesia*, but because Treitschke had introduced a species belonging to another genus, which Stephens was disposed to regard as the type of *Penthina*. Meyrick credits *Antithesia* to Guenée, but Guenée, in his "Index Methodicus," gives *corticana* as the type.

Now, *salicana* and *corticana* are structurally alike, and cannot possibly represent two different genera; therefore, I see no good reason for using both of these names; and as they were both proposed in the same year, and as *Penthina* was characterized four years earlier than *Antithesia*, I prefer to adopt *Penthina*, and allow the other to fall as a synonym of Treitschke's genus. Mr. Meyrick thinks he finds generic differences in the species he has placed under these two genera. Whether that be so or not, I do not think he can be justified in using both these generic names.

Eudemis botrana, S. V., that cosmopolitan pest of the grape, is

one of the few introduced species, as well as the wide-spread *Bactra lanceolana*, Hüb. Our author adopts the generic name *Aphelia* for this species. *Aphelia* was first proposed by Hübner in his "Verzeichniss," to include *viburnana*, S. V., and four other species, all belonging to the genus *Tortrix*, as restricted by modern authors. Stephens had not seen Hübner's Verzeichniss in 1829, when he published his Catalogue, and by mere coincidence proposed the name *Aphelia* with *egenana*, Haw., and four others, all synonyms of *lanceolana*, Hüb. Stephens became acquainted with the Verzeichniss, of Hübner, before he published his Illustrations, and finding that Hübner had previously used the name *Aphelia* for *viburnana*, and some allied species, he suppressed the name as he had proposed it, and established the genus *Bactra* instead, and, because of this, Zeller and some others have used *Bactra* instead of *Aphelia*.

The European genus *Stigmonota*, Guenée (*non* Haworth), is represented by five species, two of which are noteworthy on account of their bright orange hind-wings with a dark border.

Mr. Meyrick first referred *obliquana*, Walk., to the genus *Cacoecia*, but subsequently referred it to *Pædisca*, because of the pectination of the median vein of the hind-wings. The genitalia are totally unlike the species of *Pædisca*, but would place the species in the sub-family *Tortricinæ*. Against this Mr. Meyrick would urge the pectination mentioned above, but *Ænectra Pilleriana* has this pectination, yet no one would refer it to the *Grapholithinæ*. I think Mr. Meyrick will change his opinion when he re-examines this species.

The omnipresent *Carpocapsa pomonella*, L., has been introduced along with the apple, and that singular South European species, *Crociosema plebeiana*, Zell., occurs there, probably introduced also.

Of the *Conchylinæ*, Mr. Meyrick finds seven new genera, including *Bondia*, of Newman, which has been referred to this group, but, quite singularly, no species which could be referred to the known genera of this division.

The author promises to monograph all the *Micro-Lepidoptera* of New Zealand, a work which he seems to be admirably qualified to do.

These papers have pleased me very much, and while there is much in them to commend, there seems to be little to censure, and any errors which exist will become apparent to the author in his further studies, and be at once eliminated.

In all, Mr. Meyrick has given us 51 genera and 178 species from Australia, Tasmania, and New Zealand, but, without doubt, many more will be discovered when the country shall have been more fully explored by collectors.

TWO NEW SPECIES OF *ANAX*, WITH NOTES ON OTHER DRAGON-FLIES OF THE SAME GENUS.

BY ROBERT McLACHLAN, F.R.S., &c.

ANAX WALSINGHAMI, *n. sp.*

Length of abdomen (*cum appendic.*), ♂, 86 mm., ♀, 77 mm. Length of posterior wing, ♂, 60 mm., ♀, 58 mm. Expanse, ♂, 128 mm., ♀, 120 mm.

Wings hyaline (slightly tinged in the ♀). Neuration black or blackish; costal nervure yellow externally. Membranule blackish, white at the base. Pterostigma narrow, rather short (5 mm.), brown. 19 ante-cubital and 10 post-cubital nervules in the anterior wings in ♂, 15 and 8—10 in the ♀.

Face and mouth parts wholly yellow (? green in the living insect). Top of front with a circular (or slightly oval) black spot placed in a dusky (or slightly bluish) ring, the anterior portion of which becomes merged in a fine blackish line margining the groove. Vesicle blackish behind, yellowish in front, with a crest of black hairs; basal joints of antennæ black. Occiput very small, yellow, triangular, flat, scarcely emarginate. Back of head yellow, with a narrow blackish margin.

Thorax uniformly pale yellowish-green (in the dry insect), the double dorsal crest, and crests of the posterior cavities, brownish with black tubercles; there is a fine clothing of cinereous pubescence.

Legs black; femora pitchy-brown merging into black, the anterior yellowish beneath: length of posterior femora, ♂, 13½ mm., ♀, 11½ mm.

Abdomen slender and very long, slightly depressed in the ♂, shorter and more cylindrical in the ♀; third segment laterally constricted in the ♂; median transverse suture on the 2nd segment scarcely complete; 3rd to 6th segments very long, with the supplementary transverse suture placed considerably behind the base of each: colour greenish (or bluish) in life, with a dorsal longitudinal brown band, which becomes somewhat dilated at the supplementary sutures, and occupies the whole of the posterior portion of each segment from the 3rd, extending in an oblique manner along the sides of the segments, so that the pale colour is really indicated by long lateral spots enclosed in dark ground, but on the 3rd segment the sides are nearly wholly pale; 1st segment brownish at the base; 2nd with a large triangular posterior brown spot, and brown sutures; 7th to 10th nearly wholly brown, with pale lateral spots. Lateral depressions extending from the 3rd segment to the 9th, but only faintly indicated on the 3rd to 6th in the ♂ (more strongly so in the ♀). 9th and 10th segments more depressed, and somewhat widened in the ♂; 10th segment in the ♂ slightly broader than long; sides slightly dilated and rounded; rather more than the basal half of its upper surface slightly elevated, on which portion are three raised sinuate parallel keels, the median separated from the outer by a deep cavity on either side of it; beyond this portion there is a depression, but the apical border is raised, shining and blackish, with a faint central keel, the margin being nearly straight.

Superior appendages in the ♂ short (5½ mm.) and broad, brown, flattened and foliaceous, their apices upturned if viewed laterally; each is narrow at its base, but gradually expands, so that it is widest and sub-truncate at the apex; the inner

portion is piceous and is limited by an elevated blunt ridge, but before the apex this inner portion has a deep *grooved* excision, yellow within, each edge of which ends in a broad tooth directed inwardly and upwardly, whereof the upper is shorter than the lower; inwardly below the lower of these teeth is a very deep excision, followed more inwardly by a long and strong acute tooth, slightly curved and directed inward and downward, with small tubercles on its inner edge. (Thus these appendages are trifid at the apex inwardly if viewed from above, but only bifid if viewed from beneath, the shorter of the two outer teeth not then being visible; the whole arrangement is exceedingly complex). Inferior appendage one-half shorter, slightly longer than broad, and slightly narrower at the apex, which is shallowly excised, with upturned angles if viewed laterally. In the ♀ the appendages are short (5 mm.), long-oval, flattened, obtuse, brown plates, with a raised central longitudinal keel extending from base to apex. Valvules scarcely exceeding the 9th segment, ending in short, curved, cylindrical appendages, each of which has a bristle-like second joint.

Habitat: North California (*Walsingham*), and Guatemala.

Several examples were captured by Lord Walsingham, and the description has been made from a pair which have long borne the above name in my collection, but the species has never been described. A ♂ from Guatemala has been still longer in my collection; it is mutilated (wanting the apical half of the abdomen), but agrees entirely with the Californian ♂, excepting that there are only 16 antecubitals in the anterior wings (10 postcubitals); the size is the same.

This very fine insect agrees somewhat with the American *A. Junius* and *amazili* in the design of the top of the front, but there all resemblance ceases, its excessively long slender abdomen, and very peculiar anal parts in the ♂ (which have no parallel), being especially characteristic.

N.B.—Hagen, in his "Synopsis of the *Odonata* of America" (Proc. Bost. Soc. Nat. Hist., 1875), indicates an *A. validus* from San Diego, California. This I strongly suspect of being identical with *A. Walsinghami*, but no description has ever been published.

ANAX RUTHERFORDI, *n. sp.*

I possess two males of a reddish-brown *Anax* from Sierra Leone (*Rutherford*) so similar to *A. speratus*, Hag. (Verh. z.-b. Ges. Wien, 1867, p. 46), from the Cape of Good Hope, that I was at first disposed to identify them therewith, according to the description of the latter; but there are certain discrepancies which induce me to retain my specimens as distinct, and I propose for them the above name. It appears to me that a tabular view of the discrepant points will suffice, and in giving this I retain Hagen's original words.

A. speratus.

Unterlippe, Oberlippe, und Rhinarium schwarz.

Kopf hinten schwarz.

Obere Appendices. Die obere Fläche durchsetzt ein gewulsteter breiter Mittelkeil, der sich gleich an der Basis vom Aussenrande ablöst, und schräge gegen die Spitze geht. An seinem Ende am Innenrande im breitesten Theile des Ausschnittes vor der Spitze endet er seitlich in einen kleinen scharf nach innen gebogenen Hakenzahn.

Unterer Appendix kurz vor der Spitze etwas eingezogen.

Schenkel röthlich mit schwarzer Spitze.

Geäder bräunlich.

Pterostigma gelbbraun.

Membranula schwarz mit weisser Basis.

18 Antecubitales.

Hab.: Cap der guten Hoffnung.

A. Rutherfordi.

Front and mouth parts (excepting the black tips of the mandibles) uniformly pale yellowish.

Back of head brownish-yellow.

Superior appendages. The keel of the upper surface ends at the extreme portion of the dilated apex, and there forms a small, nearly obsolete, tooth; there is no tooth in the excision of the inner margin in the place indicated.

Inferior appendage gradually narrowing from base to apex.

Femora entirely red.

Neuration reddish-brown up to the nodus, merging into black beyond the nodus.

Pterostigma dark brown.

Membranule grey, whitish at the base.

20 antecubital nervules.

Hab.: Sierra Leone.

In size, general coloration, and other points, *A. Rutherfordi* quite agrees with the description of *speratus*, but it appears to me impossible to believe that long immersion in alcohol could so have changed the coloration of the front as described for *speratus*, and the structure of the appendages appears to be also different, although the general peculiar plan is the same in both. Some points compared in the above table are of slight importance; the coloration of the face and the discrepancies in anal structure are the principal.

N.B.—Notes by the late Mr. Rutherford on the living insect say: "Head coffee-brown. Eyes blue. Thorax: front brown, sides testaceous, beneath paler. Abdomen: ridge and margins of joints blackish-brown, otherwise light brown, shining. Taken in a marsh at Sierra Leone."

ANAX LONGIPES, Hagen. In the Ent. Mo. Mag., x, pp. 227, 228 (March, 1874), I published some notes on a male *Anax* in the collection

of the Royal Dublin Society (now Science and Art Museum, Dublin), which I was then inclined to refer to *A. longipes*, described from a ♀ in the Zürich Museum from Georgia (*Abbot*). Through the kindness of A. G. More, Esq., F.L.S., Curator of the Museum, I have been able to again examine this insect. I find one serious error in my original notes (p. 228); the length of the posterior femora is there given as "19 mm.," it should have been "14 mm." The other measurements and notes agree. I omitted to notice the membranule; it is *entirely yellowish-cinereous*, with no indication of having originally been particoloured. The top of the front is utterly without markings, and concolorous with the face. Upon re-comparing Hagen's detailed description of the ♀ (*Verh. z.-b. Wien*, 1867) I note the following special discrepancies not previously alluded to: the neuration is said to be black, here the nervures are mostly pitchy-brown and the network reddish; the membranule is said to be black with white base, here it is uniformly pale as above stated; the markings on the abdomen there noticed are here absent, or have become obsolescent. Therefore, I now do not feel quite confident as to the identity of this example with *A. longipes*, which latter should rest on the authority of the ♀ in the Zürich Museum (which I have not seen). I thought it advisable to compare the Dublin mutilated ♂ with a ♂ of *A. Junius* of the same expanse of wings. Putting on one side the obvious discrepancies in the design of the top of the front, &c., I find structural differences of importance: in *Junius* the top of the front is narrower and more produced; the occiput is more extended between the eyes (hence the eyes are less contiguous); the posterior legs are perceptibly shorter; the abdomen (to the end of the 6th segment) is shorter; in the Dublin insect the transverse supplementary median suture on the 2nd segment is interrupted in the middle (as is stated by Hagen for *longipes*), and the space between is filled-in by a somewhat triangular coarsely-granulose plate (in *Junius* this suture is not interrupted, but is strongly angulose in the middle). If, therefore, this Dublin example be not *longipes* (and there are reasons why it should not be so), I do not know what it is. I have shown that other Dragon-flies in the Dublin collection *apparently* came from *Abbot*, but no record exists to that effect.

ANAX TRISTIS, Hag. (*Verh. z.-b. Ges. Wien*, 1867, p. 35), and A. GOLIATH, De Selys (*Rev. et Mag. d. Zool.*, 1872, p. 178). I incline to the opinion that these represent ♀ and ♂ respectively of one species. So far as I am aware, Hagen has only seen the ♀, and De Selys and

I have only seen the ♂. Hagen's ♀ (*tristis*) was from Guinea, De Selys' ♂ (*Goliath*) from Madagascar: I have three ♂, one from Abyssinia, one from "West Africa," and one from Jellah Caffee (West Africa), indicating a very wide African distribution (such a powerful insect as this must be *very* difficult to capture). My three ♂ agree specifically, and also with the description of the type from Madagascar (excepting unimportant *slight* differences in size, &c.), but that from Jellah Caffee is evidently immature, having the brown margining of the membranule in the posterior wings only faintly indicated, and the large yellowish-brown space near the middle of the wings is undeveloped; nevertheless, it is only this immature specimen that shows what is no doubt the natural green colour of the body (which has become much changed in the others). The labium (as well as the labrum) is bordered with black as is indicated by Hagen, but not noticed by De Selys. The length of the abdomen given for *tristis* is much less than that given for *Goliath*, and than in my specimens (82—87 mm.), but this is a usual condition in *Anax*. Most other points agree sufficiently, and I think the only discrepancies are due to sex and change of colour through desiccation. This is one of the largest and most powerful Dragon-flies in existence.

Lewisham, London :

October, 1883.

The butterflies of Cambridge.—The following is a list of the *Rhopalocera* I have noticed or captured here. I say noticed, as I am always loath to exterminate rare or uncommon insects, and, as a rule, let a butterfly or moth of that description enjoy its liberty when I have satisfied myself as to its identity. By Cambridge, I mean the immediate neighbourhood of the town itself. I have frequently seen insects reported as having been taken here that have really been captured at places ten or fifteen miles away. I think such loose description should be avoided, or we may for ever despair of seeing the insect fauna of Great Britain correctly mapped out. *Argynnis Aglaia*, *Euphrosyne*, *Selene*; *Vanessa urticae*, exceedingly abundant this year, *polychloros*, *Io*, very abundant this year; *Pyrameis Atalanta*, abundant, *cardui*; *Apatura Iris* (one); *Melanargia Galathea* (one); *Satyrus Semele*, not common; *Epinephele Janira*, *Tithonus*, abundant, *Hyperanthus*; *Cænonympha Pamphilus*, abundant; *Lycæna Ægon*, *Icarus*, abundant, *Corydon*; *Colias Edusa* (one); *Rhodocera rhamni*; *Papilio Machaon*; *Anthocharis cardamines*; *Pieris napi*, *rapæ*, exceedingly abundant, *brassicae*, exceedingly abundant; *Hesperia malvæ*, *Sylvanus*.—ALBERT H. WATERS, Mill Road, Cambridge: October 8th, 1883.

NOTES ON BRITISH *TORTRICES*.

BY CHAS. G. BARRETT.

(Continued from Vol. xix, page 136).

Tortrix icterana.—Larva three-quarters of an inch in length; cylindrical, active. Colour smoky-black, with the spots pure white, large, and prominent; head and both plates jet black, collar of second segment white. These larvæ were sent by Mr. Dunsmore, formerly of Paisley, and fed on *Centaurea nigra*, in the middle of June, emerging in July.

The larva of *paleana*, Hb. (*flavana*, H.)—of which, *icterana*, Fröl., is made by Wocke a variety—is said by Zeller to be “dull black, with the incisions of the segments paler, with *deep black raised dots*.”

Tortrix viburnana, Schiff.—Larva cylindrical, extremely active. When young, pale grey or dark olive-green, changing to pale olive-green or greenish-black, and having a paler or yellowish line above the legs. Spots distinct, white, with white hairs; head light brown with two triangular black spots behind; dorsal plate very pale brown, edged at the sides with black, and with a triangle of black dots in the middle; anal plate pale brown edged with black. Feeding at the end of May and early in June on *Vaccinium myrtillus*, *Erica cinerea*, and other plants on heaths. Pupa black, in a white silken cocoon loosely made among heath-twigs.

Wilkinson describes the larva as “white, with black spots”—a remarkable looking larva apparently!! Zeller’s description agrees very nearly with mine. He gives as food-plants, “*Viburnum*, *Vaccinium*, *Andromeda*, and *Ledum palustre*.”

Tortrix viridana, L.—Larva not very active, plump, and tapering behind. Colour, pale green, or pea-green, with the spots distinct and black; head and legs shining black; dorsal plate green or grey, with a white collar and black dots behind; anal plate green or pale yellowish. A far too well known larva, feeding generally on oak, but sometimes on maple, rolling the leaves into cylinders; Hofmann says also on sallow and *Sorbus*, and that there is a brown spot on the eighth segment. This is not always visible.

Tortrix Forsterana, Fab.—Young larvæ were found on January 15th feeding between united leaves of ivy (*Hedera helix*), gnawing away the surfaces of both leaves, but leaving the external skin untouched, apparently indifferent to severe frost, from which they were

doubtless protected by a habitation of white silk between the leaves. These young larvæ were of a dull yellowish-green, greyer on the back, with a visible, internal, broad, green dorsal vessel, interrupted between the segments; spots of the body-colour, but shining, and having distinct hairs; head black, with light brown jaws; dorsal plate blackish-brown; anal plate hardly visible, yellowish; anal prolegs extended, yellowish.

In June, full-grown, and nearly one inch long, plump, not very active, nearly cylindrical, dirty pale green, greyer on the back, spots shining green, indistinct—or, dull whitish, with the whole dorsal region slate-grey, and the spots whitish. Head black, with the eyes brown; dorsal plate pale yellowish-brown with two large black spots near the posterior corners; anal plate yellowish or grey, with two black spots. Feeding on many plants, generally those with firm thick leaves. Pupa blackish, in a rolled leaf. Zeller's description of the larva is very brief, but agrees with the above as far as it goes.

Tortrix heparana, Schiff.—Larva cylindrical, active, bright pea-green, with slightly darker dorsal line, and sometimes bluish-green sub-dorsal lines; under-parts pale green; spots invisible; head variable, pale green, pale yellowish, or very light brown, and when full-fed, dotted behind with black, plates green; the dorsal having two black dots behind. In June, on elm, willow, blackthorn, dewberry, &c., drawing leaves together. Pupa blackish, in the larval habitation.

Zeller says of this larva: "light green, tinged on the back with darker or lighter grey, with *dirty white* raised dots. Pupa slender, brown, black in front."

Tortrix ribeana, H.—Young larva active, slender, cylindrical, pale green, or pale yellow, with broad, dark green, internal dorsal vessel; head yellowish-brown, with four wedge-shaped black spots on the hinder edge; dorsal plate yellow, with a broad, black, hind margin; anal plate yellow, feet black. When older, pale green, with straight, deep green, dorsal line, and the divisions of the segments very pale; sides paler green; spots shining; head very light green, with the wedge-shaped spots smaller, but some additional spots laterally of a dark brown; plates green. When full-grown the head seems to lose the spots and become green. This variable larva has been repeatedly described, and Zeller mentions small black spots. It feeds in June on all sorts of trees, and becomes a brown pupa in the rolled or drawn-together leaf.

Tortrix sorbiana, H.—I have repeatedly attempted to rear a larva which, from its large size, must be that of *sorbiana*, but with the invariable result of obtaining a bunch of ichneumon cocoons. This larva measures one and one-third inch, and is very active and stout—thickest in the middle—with swollen segments. Colour, dark olive-green, tinged on the back with smoky-black, spots white with white hairs; head flattened, black; dorsal plate light olive-brown, spotted with blackish, and divided down the middle, and having a white collar; anal plate greenish; feet black. Rolling up leaves of oak in the first half of June.

Zeller says: “dark grey or bluish-grey, with white dots, head glossy black, neck brown, pupa black-brown.”

Tortrix costana, Sch.—Larva not very active, cylindrical, but rather tapering at both extremities, dorsal region of a dark, smoky, olive-green colour, below the spiracles greenish-white, spots distinct, whitish, with short hairs; head and dorsal plate black; anal plate greenish-grey. This larva was found on a *Centaurea* in the garden, but it is also found, not commonly, in the neighbouring marshes in June.

The pupa is blackish, enclosed in a white loose cocoon.

This larva (evidently, when younger) is described by Moritz as grass-green, with darker internal dorsal vessel; head yellow-brown, dotted with darker brown; dorsal plate with a brown spot on each side.

Tortrix Podana, Scop.—Young larva active, cylindrical, pale yellowish; head and plates black; anal plate very small. Full-grown larva nine or ten lines in length, stout, but rather attenuated at anal extremity, yellowish-green with a tinge of pea-green on the hinder part of each segment, spots invisible, hairs rather long; head shining brown, with darker jaws; dorsal plate black, with a white collar; anal plate green. April to June.

According to Tischer, it is “glossy green-grey, with raised spots of the same colour, having black central dots; head and anterior feet black, and a little black shield above the anal feet; dorsal plate black-brown, suffused with pale brown in front.”

Wilkinson's description differs from both the above in part, and in part agrees with both, demonstrating the variability of the species.

Tischer says that the pupa is brown, with beautiful grass-green wing-sheaths. This I have not observed.

*Tortrix xylostean*a, L.—When young the larva is slender, and

slightly flattened, with segments deeply divided; it is rather pugnacious, discharging a reddish fluid from the mouth, with a threatening action when touched. Colour pale slate-colour, with black spots on the 3rd and 4th segments, and faintly whitish spots on the segments behind these. When full grown, it is plump, tapering to each extremity, of a whitish-grey; sometimes tinged with bluish-green, head and plates shining black; the dorsal plate with a white collar, and sometimes edged with white behind; legs black, claspers pale greenish, dotted with black. Rolling up leaves of oak, elm, and other trees. June.

Pupa dark brown, in the rolled leaves.

Zeller says of the larva: "blue-grey above, with four pale spots on each segment, pale grey beneath, head, dorsal and anal plates black."

Pembroke: 17th August, 1883.

DESCRIPTIONS OF TWO NEW SPECIES OF BRITISH ACULEATE HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

The two species which I am about to describe, viz., *Pompilus unguicularis*, Thoms., and *Tachytes lativalvis*, Thoms., will probably be found to exist in many localities when looked for, as they bear such a close general resemblance to other allied species, that they have probably been hitherto confounded with them in this country. In *Pompilus* especially, the general resemblance which the small red-bodied species bear to one another is most perplexing, and yet the structural characters will be found to be well defined, and can be relied on with safety when once realized. The following short description will give the chief characteristics of the new species.

POMPILUS UNGUICULARIS, Thoms., Opusc. Ent., p. 221; Hym. Scand., iii, p. 194.

Like all the other small red-bodied species in colour; metathorax not pilose; prothorax sharply and angulately emarginate posteriorly; third submarginal cell sub-triangular; anterior tarsi with long spines in the ♀, posterior tibiae simple in the ♂; ventral segments in the ♂ not longitudinally impressed, apical dorsal valve of the ♀ finely pilose, clypeus in the ♀ with its anterior margin somewhat thickened, and with a row of stiff bristles above it; apical ventral valve in the ♂ flat, with a distinct central carina widening towards the base, and destitute of a pendant spine or spine-like apical hairs. The spines between the claws of the tarsi in the ♀ are very long and curved, considerably passing the apex of the pulvillus, posterior-wings with the cubital furcature situated some distance beyond the apex of the anal cell.

Hab. : Hayling Island, Deal, Chobham.

Sir Sidney Saunders possesses a ♀ without note of locality. In the long unguicular spines the ♀ of this species resembles *chalybeatus*, but the finely pilose dorsal valve of the 6th abdominal segment, the row of many bristles above the margin of the clypeus, and the position of the cubital furcature of the hind-wing will distinguish it at once.

TACHYTES LATIVALVIS, Thoms., Opusc. Eut., p. 242.

♂. Black, punctured, abdomen with the base red, face densely clothed with brilliant golden pubescence.

This species, of which I have only at present seen the ♂, is very closely allied to our common species, *pectinipes*, but may be distinguished in the ♂ by having the eyes more closely approximating on the vertex, by having the face, right up to the ocelli, densely clothed with bright, almost orange-gold pubescence, the meso-thorax more strongly punctured, and more or less clothed at the sides with very short golden hairs, and the anterior femora and tibiæ pale in front. It is also a rather larger insect than *pectinipes*. Thomson says that the ♀ may be easily known by the much broader dorsal valve of the 6th abdominal segment, which is hardly one-half longer than the width of its base, and by the unequal claws of the anterior-legs.

Hab. : Sandhills, Deal: August, 1882.

Lloyd's, E.C. : September, 1883.

ON *HYPONOMEUTA RORELLUS*, A GREGARIOUS "ERMINE"
WHICH FREQUENTS THE COMMON WILLOW (*SALIX ALBA*).

BY H. T. STAINTON, F.R.S.

This insect, which, in the perfect state, might readily be mistaken for the common *H. padellus* of our hawthorn-hedges, is distinguished at once in the larva state by its food: *Salix alba* (the common willow).

Its general distribution throughout Germany had long been known to me, but of late my attention has been drawn to its occurrence in various localities in Holland. The geographical position of the Low Countries, our nearest neighbour on the eastern coast, between the latitudes of London and Hull, seems to render it extremely probable that any *Micros*, which are widely scattered about Holland, should also occur with us.

In June, 1829, Heer Ver-Huell noticed that many of the willow-trees near Rotterdam were disfigured by a great many webs of some small gregarious larvæ; these larvæ were full-fed early in July, and the moths began to appear on the 23rd of that month. This notice by Ver-Huell appears in the 5th volume of Sepp's work, p. 124.

In the 1st volume of the "Bouwstoffen voor eene Fauna van

Nederland," p. 123, is a "Bijdrage tot de Soortkennis der Hyponomeutæ," by H. W. De Graaf, here, at p. 132, the author mentions that he had in that year (1852) found the nests of the larvæ of *H. rorellus* on many willow-trees in the neighbourhood of Woerden during the month of June, when the larvæ were nearly full-grown.

In the third volume of the "Bouwstoffen," p. 221 (the article appeared in 1864), De Graaf informs us that in 1853, when riding along the road by Gouda, near Rotterdam, he noticed that the willow-trees along the road-side had many of the webs of these larvæ on them; he afterwards also noticed them near Leyden. He mentions as other localities where the insect had been observed, Amsterdam, and Gontum, in Friesland.

P. C. T. Snellen's great work on the *Micro-Lepidoptera* of the Netherlands (De Vlinders van Nederland, Microlepidoptera, 8vo, pp. 1196) appeared last year, and we there, p. 508, find mentioned two additional localities: the late van Medenbach de Rooy having observed the insect in Gelderland, and van den Brandt had met with it at Venlo, in Limburg.

A point of interest in the habits of the insect is at present not clear, and it would be very desirable to ascertain which of the observations recorded is the correct one.

Zeller, in the *Isis*, 1844, p. 219, says that the cocoon of the pupa is slight and transparent, like that of *variabilis* (our *padella*), but Ver-Huell says that the larvæ make no separate cocoons, and De Graaf says even more distinctly that the pupæ hang naked in the main larval web; if so, it would show an affinity in habit to *Scythropia eratægella*, but I confess I should like to have further precise information on this subject.

There are, no doubt, many entomologists amongst us, who, though probably indifferent as to adding a species to their collections, would still find a pleasure in proving the erroneous nature of some observation recorded by a previous writer, and here they are certain to have that pleasure, as the pupa cannot *both* be naked and enclosed in a slight cocoon, so that there must be error somewhere.

As noticed at the commencement of this article, the perfect insect can hardly be distinguished from many forms of *H. padellus*, though the more distinctly white costa on the *under-side* of the anterior-wings is indicated as a good character.

A NEW *PHYLLODES* FROM CEYLON.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

In a collection of *Lepidoptera*, from which a selection was recently purchased for the Museum, I found a single example of the interesting genus *Phyllodes*, which, undoubtedly, is distinct from its nearest congener *P. consobrina*, of Silhet; the differences are as follows:—

PHYLLODES MALIGERA, *sp. n.*

Primaries of a uniform pale olive-brown, the areas which are shining slaty-grey in *P. consobrina* being sub-opaline and sericeous, but not distinctly grey; the sigmoidal marking (on the discocellulars of primaries) less angulated and broader at its inferior extremity, so as more nearly to approach that of *P. roscigera*; secondaries with the rose-red patch longer than broad, instead of broader than long, the white spots slightly smaller than in *P. consobrina*. Expanse of wings, 132 mm.

Ceylon (*Thwaites*).

The smallest examples of *P. consobrina* measure about 140 mm. in expanse: this Ceylon species will stand between it and *P. roscigera*.

The pupa, also in the collection, is 44 mm. in length, cylindrical, with the head slightly prominent, and the caudal extremity longitudinally corrugated; the colouring is dull metallic-bronze, partly encircled behind the thorax and above the wing-coverings (on the dorsal surface), and entirely encircled beyond the wing-coverings, by shining metallic-bronze hoops; in front of these shining zones the segments are spotted with patches of impressed rounded black spots; the head, thorax, leg-, and wing-coverings are rugose, the last-mentioned being most finely so, and the leg-coverings most coarsely; the back of the abdominal segments, when drawn out, is smooth and reddish immediately behind the metallic zones; the tail is hooked into a small web of sandy-testaceous silk.

The chrysalis of this species is one of the most singularly beautiful, and almost artificial-looking, pupæ that I have seen.

British Museum: *October*, 1883.

ON THREE NEW SPECIES OF JAPAN *EROTYLIDÆ*, AND NOTES OF OTHERS.

BY GEORGE LEWIS, F.L.S.

ENCAUSTES PRÆNOBILIS, *n. sp.*

Nigra, nitida, thorace supra rufa, margine maculisque decem nigris. Elytris subtiliter punctato-striatis, interstitiis tenuissime alutaceis,

maculi parva humerali, singulis cum fasciis transversis subapicalibus rufis.
Long. 16—36 mill.

Black, shining; head coarsely and rather unevenly punctured, with a smooth irregular disc between the eyes; thorax with lateral margins raised, and so continuing round both angles, and then gradually smoothing down in the medial region, punctured like the head at the sides, but on the disc the punctures become almost obsolete; above red, with the margin and ten spots black, three basal, three frontal, and two lateral confluent with margin, two discoidal and isolated. Elytra finely punctate-striate, interstices very finely wrinkled, humeral angle raised and red, the sub-apical fascia is small, with an outer and sutural margin of equal breadth, black. The abdomen is sparingly punctured. The ♂ has a tooth or process on the anterior margin of the fore-tibia.

The red markings of the elytra are almost identical with those in *cruentata*, Macleay, while the spots on the thorax are less confluent, and the thoracic margins more sinuate and raised.

This species is fairly common in all the islands where there are beeches in the forests, and they are to be seen in warm weather crawling on large *Boleti*, often twenty feet overhead. Out of forty examples the most measure 27 to 31 mill., extreme sizes being as given above.

MEGALODACNE BELLULA, *n. sp.*

Nigra, nitidissima, capite thoraceque sparse, elytris seriatim, punctatis; interstitiis obsoletissime punctulatis; transversim bifasciatis, annulo humerali integro, interne ramoso.
Long. 13—16 mill.

Black, shining; head and thorax with scattered punctures. On the head two punctures are large at the base, and small and even on the forehead. The canthus of the eye is well marked above. The thorax has a large cluster of punctures formed in a fovea at the base, and then extending in a broken way to a second cluster in a depression behind the eye. The lateral margin is elevated and rather thick. Elytra punctate-striate, with a humeral fascia posteriorly tridentate, and a black spot quite isolated in its centre. The fascia nearly touches the base of the elytra for about two-thirds of its breadth; on the outer edge the elytral emargination is black. At the suture, it leaves a black margin equal to about the breadth of two striae and two interstices. The sub-apical fascia has anteriorly two obscure outer denticulations, then three well-marked, and posteriorly three distinct.

The ♂ is distinguished by dilated tarsi, and two arch-shaped depressions on the last segmen of the abdomen, with the space between them raised.

I sent specimens to Herr E. Reitter, who informs me this is not his *flavosignatus* from Siberia. I obtained plenty of examples in the elevated beech-forests of all the islands in May and June.

EPISCAPHA PERFORATA, *n. sp.*

Nigra, sat nitida, capite thoraceque fortius punctatis, scutello rotundato, lævi. Elytris seriatim punctatis, interstitiis sub rugoso-punctatis, fasciis E. Fortunei simillimis. Long. 6—7 mill.

Black, rather shining, head and thorax very strongly and evenly punctured, the latter with a smooth transverse space before the scutellum; scutellum round and smooth, elytra punctate-striate, with punctures in rows down the interstices, the whole surface of which appears finely rugose, but under the microscope this rugosity is seen to be owing to exceedingly fine punctures.

This species is near *cordata*, Gorham, and its small size, and round scutellum, separate it from any other Japan species. I obtained only two examples: Oyayama and Yuyama, in Higo, are the localities.

Episcapha taishoensis, Lewis. — In addition to the characters given before, a longer series enables me to distinguish it from *Gorhami*, its nearest ally, by the broader and more transverse head, and by a remarkable angulated projection in the canthus of the eye behind the antennæ, which is seen easily from above. I obtained it in South Yezo.

Episcapha Gorhami, Lewis, is exceedingly abundant in all the forests.

Episcapha Fortunei, Crotch, is local, and attached to the fungi growing solely on fir; all the other species avoid conifers, and occur on deciduous trees.

Episcapha hamata, Lewis, I did not meet with; the type was taken by Mr. Maries, and is still unique in my collection. This and the preceding are pubescent.

39, High Street, Wimbledon:

September 25th, 1883.

Variety of Hepialus hectus.—I have met with a lovely variety of *hectus* here this season. The under-wings have, on each of the marginal spaces between the veins, a broad streak of gold, nearly the whole width of the space, softened into the ground-colour at the edges. The upper-wing has much more of the gold markings than usual, and altogether it is a very brilliant form. There seems to be a variety of the female to correspond; it has the upper-wings barred with rather ill-defined silvery fasciæ, giving it a very different appearance from the ordinary form. It is certainly rare, and apparently very restricted in locality. *Telveda* is rather abundant here, also some forms of it very similar to those from Shetland.—J. SANG, 181, Horninglow Street, Burton-on-Trent: October 19th, 1883.

Crambus ramosellus: change of nomenclature.—The name *ramosellus*, applied by Zeller in his Monograph to a species of *Crambus* from Sicily, cannot stand, as there is another *Crambus ramosellus*, from New Zealand, described by Doubleday some twenty years previously. Both species are truly referable to *Crambus*; and as Zeller's Sicilian species has not, so far as I am aware, been described under any other name, it becomes necessary to rename it. I called the attention of Prof. Zeller to the case in a letter written to him shortly before his death, being desirous that he should himself make the requisite alteration, but he had not replied to me, nor am I aware that he had suggested any name. I therefore propose the name of *Cr. epineurus* for the Sicilian species.—E. MEYRICK, Ramsbury, Hungerford: October 6th, 1883.

Panorpa germanica, var. *borealis* (Leach), Steph.—Towards the end of last July I captured at Tongue, Sutherlandshire, examples of a *Panorpa*, which differed from anything with which I was acquainted. They are, on an average, smaller than *P. germanica*, and the wings are without dark spots, save that in the females there is sometimes a small pterostigmatic spot, and a few minute dark dots. I submitted specimens to Mr. McLachlan, who informed me that it was described as *P. borealis*, by Stephens, and that, in his opinion, it was a variety of *P. germanica*, L. It is interesting to note that the type-form of *P. germanica* does not occur in the district, nor does any other species of the genus, so far as I could discover by diligent search during nine weeks' sojourn.

If any Neuropterist requires specimens, I will be happy to supply him with them.—J. J. KING, 207, Sauchiehall Street, Glasgow: October 8th, 1883.

[*P. borealis* was described by Stephens in the "Illustrations," Mandibulata, vi, p. 53 (1835). With regard to the wings, he says, "hyaline, with the nervures and a spot on the costa towards the apex brownish," adding, "this may probably be a variety of the preceding species (*apicalis*). Found in the neighbourhood of Edinburgh." In Curtis' "British Entomology," pl. 696 (dated 1838), we find "*borealis*, Leach., MSS.; wings hyaline, stigma and nervures fuscous. In the British Museum: it was found by Dr. Leach, near Edinburgh." Stephens does not allude to Leach., but there can be no doubt that both notices refer to the same insect. The locality given, viz., "near Edinburgh," may, or may not, be precise; half a century ago entomologists did not attach so much importance to these matters as they now do.

It appears to me impossible to discover any structural differences between "*borealis*" and the ordinary form of *germanica* (and in *Panorpa*, structural characters are of primary value). But Mr. King's observations are of real importance, because they prove that at a point on the extreme north of the mainland of Scotland, this form "*borealis*" alone occurs, and I believe he found nearly 100 specimens of it. The form is well worthy of retaining its name, as a variety. Presumably it is the same form that Wallengren (Skand. Neuropt., p. 71) indicates as var. A of *germanica*, with the remark, "Vingarne nästan utan alla fläckar."

P. apicalis, Steph. (referred to above), is a form of *germanica*, in which the markings of the wings are absent, excepting an apical dark border; this is found (rarely) with the typical form, irrespective of locality.—R. McLACHLAN.]

Elipsocus cyanops, Rostock, in Scotland.—On June 26th, 1880, I took a few specimens of this species at Kilmun.—ID.

Occurrence of *Cæcilius piceus*, Kolbe, in Britain.—On the 25th July, 1881, I had a day's collecting at Box Hill, on which occasion I captured three examples of a *Cæcilius*, which proves to belong to the above-named species, described by Herr Kolbe in 1882.—ID.

[Mr. King kindly presented one of these specimens to me; the identification of the species has been confirmed by Herr Kolbe. It belongs to the difficult "*obsoletus* group" (cf. Ent. Mo. Mag., xix, p. 183), and is to be separated from the (apparently) three or four other species of the group known as British, by its dark colour, combined with some structural characters to which Kolbe directs attention. The original examples were from Saxony; I believe it also occurs in Finland.—R. McLACHLAN.]

Occurrence of *Æcetis furva*, Ramb., and other Trichoptera in Co. Monaghan, Ireland.—I recently received from Miss A. B. Freeland, of Uddingston, a number of Trichoptera collected in the neighbourhood of Glasslough, Co. Monaghan, Ireland, during July last. Amongst these are three ♂ examples of *Æcetis furva*, Ramb., an insect that has as yet been rarely taken in these islands, the only recorded localities, so far as I know, being Norfolk, near London, and the English Lake district.

As the locality is somewhat out of the way, it may be well to mention the other species included in the collection. These are: *Phryanea striata*, L. (? the single specimen is mutilated), *P. obsoleta*, McL., *Limnophilus marmoratus*, Curt., *Leptocerus aterrimus*, Steph., *L. cinereus*, Curt., *Mystacides longicornis*, L., *Polycentropus flavomaculatus*, Pict., *P. multiguttatus*, Curt., *Holocentropus picicornis*, Steph., *Cyrtus trimaculatus*, Curt., *Ecnomus tenellus*, Ramb., *Tinodes Wæneri*, L., and *Lype phæopa*, Steph.—KENNETH J. MORTON, Carlisle, N. B.: October 1st, 1883.

Captures of Coleoptera near Pitlochry, Perthshire.—Having collected beetles from the beginning of April to the end of August, within a radius of five miles of Pitlochry, I send you a list of the rarer species I took. The majority of the species were named by the Rev. W. W. Fowler, M.A. *Bembidium stomoides*, one under a stone by river-side; *Hydroporus celatus*, in a small loch, hot sunshine, *monticola*, small loch, *congener*, curling pond, *arcticus*, not uncommon, *nitidus*, small loch; *Sphærites glabratus*, three, one flying, one under a dead rabbit, one on a broken birch; *Tachinus pallipes*, sheep's droppings, *elongatus*, sheep's droppings; *Mycetoporus lucidus*, in fungus, *punctus*, in moss; *Quedius lævigatus*, dead bird; *Philonthus succicola*, dead birds, &c., *scutatus*, dead birds, &c.; *Xantholinus ochraceus*, under bark of decaying Scotch fir; *Geodromicus nigrata*; *Anthobium sorbi*, in flowers; *Trichopteryx seminatus*, sheep's droppings, *volans*, dry refuse in farmyard; *Omosita depressa*, dead animals; *Ips quadripustulatus*, under bark of Scotch fir; *Corymbites impressus*, on Scotch fir; *Telephorus obscurus*, by beating;

Cedemera livida, three, by sweeping; *Rhinomacer attelaboides*, by beating various trees, only three; *Otiorrhynchus septentrionis*, beat from birch, *maurus*, one, under a stone; *Eriirrhinus aethiops*, river-side, after a spate; *Trypodendron lineatum*.—ALFRED BEAUMONT, Low Valleyfield House, Culross, N.B.: October 15th, 1883.

Some garden-visitors in 1883.—Having been kept within doors from the middle of May until the end of June, I am unable to say what sort of insect aristocracy or rabble visited the garden during that period; but on the evening of the 6th July, and for a week after that, there were a great many *Plusia gamma* flying about, and these may have been the remnants of a large invasion or migration, respecting which our friend Barrett is curious (p. 21, *ante*), but this is information of a character too restricted to aid his hypothetical research.

On the 6th July I also saw at one time two *Vanessa cardui*, a butterfly rarely visiting our garden. These "painted ladies" were surely belles of last year; their paint was nearly all worn off, yet in their faded charms they were as lively as if they had just come out in their first season, and they made such a vigorous attack on the old-fashioned, modest Sweet Williams, that these blushed a deeper red,—at least I might well believe they ought to have done so. Not in the least abashed, these *belles dames sans merci* then gaily departed on their tour of flirtation.

On the 10th July a *Macroglossa stellatarum* came suddenly, and paid frantic attention to the geraniums standing close to my chair, giving me good opportunity to see that it was a female newly disclosed, in splendid plumage. This is an insect that I have never seen here before, nor, indeed, have I since had such a beatific vision. To plagiarize Wordsworth:—

"She was a phantom of delight,
When first she gleamed upon my sight;
A lovely apparition, sent
To be a moment's ornament:
A dancing shape, an image gay,
To haunt, to startle, and waylay."

I was but an accidental spectator of the elfin evolutions; none the less was I delighted with the flying visit of a representative of one of the earliest illustrators to me of the poetry of insect-life.

On June 30th a male *Lucanus cervus* swung himself with leisurely flight into the garden, sailed about majestically for some time, and received my congratulations. I had feared, in consequence of not seeing any of his family last year, that the race had become extinct in these parts, by the destruction of trees which continually goes on to make room for builders' "improvements," and so I was happy to find that I had yet one old friend on visiting terms, although he was in the guise of "such small deer."

Speaking generally, all kinds of insects—that is, the ordinary *habitués*—have been scarcer than usual. *Abraxas grossulariata* has been a failure, only two or three individuals having been seen, instead of the multitude generally apparent. *Nematus ribesii* has been very rare. The *Aphides* on the roses were at one time tolerably common, but not harmful. *Schizoneura lanigera* just visible here and there, but not persistent. *Lecanium ribis* ordinarily common on the red currant

(*Ribes rubrum*), I observed for the first time on the gooseberry bushes (*R. grossularia*). *Rhizotrogus solstitialis* kept its time at the end of June, but only in small number. A *Thrips*, which I take to be *Phlæothrips ulmi*, Fab., abounded as larvæ, from September last all through the winter, under the bark of large branches of *Acacia* cut off four years ago; from the 20th to 30th June most of them had become perfected, some, however, then still remained larvæ.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 2nd August, 1883.

Obituary.

Professor Oswald Heer died at Lausanne, on the 27th September, in his 75th year. He was born at Nieder Uzwy, Glarus, Switzerland, August 31st, 1809. Intended by his family for the church, his predilection for natural history studies induced him to abandon that idea, and, at a comparatively early age, he became Professor of Botany and Natural History at the Polytechnic University of Zürich, to which institution he remained attached up to his death. Heer's early reputation was made as an entomologist, and from 1834 forwards, he published many works and papers on entomology, chiefly on Swiss insects, and more especially on *Coleoptera*, most of which treated exhaustively on the vertical distribution of species in the Alps. Possibly he is best known (as an entomologist) in this country by his monographic work on the Beetles of Switzerland, which appeared in 1838—41. In this work he did for the *Coleoptera* of that country what Frey has more recently done for the *Lepidoptera*, but, of course, lapse of time has rendered Heer's labours out of date, as compared with Frey's. This monograph appeared in two forms, but that which is best known was styled, "*Fauna Coleopterorum helvetica*," and extended to over 600 pages.

Latterly, Heer's earlier labours, as an entomologist, have, to some extent, been forgotten, eclipsed by his later devotion to palæontology, of which the first evidence appeared so long ago as 1847, when was published the first part of his memoir on the fossil-insects of the celebrated tertiary formation at Cœnigen. It is not necessary for us to detail his palæontological works; suffice it to say that he had long been regarded as the first authority on fossil insects and plants of the tertiary epoch in Europe.

Sometime about 1850, Heer fell into bad health, and visited Madeira and the Canaries. We believe we are correct in stating that his malady developed itself to such an extent as to soon render him a confirmed invalid, incapable of self-locomotion, but his intellect developed to such a degree that all his best palæontological and professional work was carried on while he laboured under the greatest physical disadvantages. His labours received due acknowledgment in this country. In 1871, he was elected one of the fifty Foreign Members of the Linnean Society, and in 1877 he was awarded one of the Royal Medals by the Royal Society.

SOME FURTHER OBSERVATIONS ON THE PARTHENOGENESIS OF
ZARÆA FASCIATA, AND ON THE EMBRYOLOGY OF THAT
 SPECIES AND OF *RUMIA CRATÆGATA*.

BY J. A. OSBORNE, M.D.

During the past summer I have continued my observations on *Zaræa fasciata*, and confirmed most of those of which an account was given in this Magazine, in the number for Oct., 1882 (p. 92). Before passing to points of fresher interest, I wish first to mention some facts newly noticed, which modify or extend particular statements in my last paper. And to take them in the order in which they there occur, I have to say, in the first place, that the colour of the cocoon is influenced by the food. The "dark brown (resinous-looking) cocoons" are made by larvæ fed on snowberry leaves alone; whilst those whose sole or chief diet is honeysuckle make cocoons much lighter in colour, pale dirty greenish, which, though they look slighter seem to be not less efficient than the others. When comparing the great difference in size of the full-fed larvæ to that of the larvæ of *Nematus ribesii*, my supposition at the time was, that the smaller larvæ might yield male flies next season. This supposition did not prove correct. I have noticed differences of size in the ratio of about 2:1 in the fresh-laid eggs, in the newly-hatched larvæ and larvæ full-grown, and in the flies themselves, without any difference of sex. The peculiar bands connecting the saw with its back were the subject of some correspondence with a gentleman in Eton, and I think it right now to state that I have not since been able to procure any separation of the saw from its back or sheath, without at the same time bringing away these processes, in the form of little tufts or brushes adherent to the latter. Their connection with the saw itself appears to be extremely slight, and their nature and use I cannot conjecture.

Besides steadying the leaf with the apical spines of the posterior tibiæ when about to insert its ovipositor, the fly further makes use of the hinder angles of the valves (with which it subsequently pinches and closes the orifice), to hold the leaf firm at the very point where the extremity of the saw is to be first introduced. The mine is mostly beneath the upper surface, but instances are not infrequent in which it is found immediately under the lower cuticle.

Last year I was not able to say positively in which end of the egg the head of the embryo develops. As the result of numerous observations I am now in a position to state, that the head of the embryo is found in the upper and the lower pole of the egg with about

equal frequency. Often we meet with two eggs lying together, evidently laid by the same fly with the same orientation, in which the heads of the embryos lie in opposite directions. This is in direct contradiction to the dictum of Leuckart: "Der obere Pol des Eies beherbergt in allen Fällen das Kopfende des Thieres" (Ueber die Micropile, &c., *Müller's Archiv.*, 1855, p. 102). Rare exceptions to the rule occur also, as I have already shown, in the eggs of *Gastrophysa raphani*. The position of the dorsum and venter of the embryo, as pointed out in my former paper, is itself abnormal in these eggs; development commencing on what should be (according to Herold, &c.), the "*dorsal*" side of the egg, and the dorsum of the embryo facing, and lying along the "*ventral*" side of the egg, if the orientation of the latter is determined with reference to the parent fly. To this regular abnormality in *Zaræa* I have, however, in last summer's observations, seen 3—or at any rate 2—decided exceptions, in which the dorsum and venter of the embryo occupied the reverse positions in the egg. The bilateral symmetry of this egg is so decided that it is not easy to make any mistake. In one instance I found an egg in the mine, not lying on its side as usual, with its transverse, shortest, diameter, but with its dorso-ventral axis, vertical to the plane of the leaf, and therefore causing much more distension of the mine, but without any other irregularity. A more striking irregularity I shall perhaps best describe in the words of the note made at the time: "June 3rd, I have just opened a marked mine of *Zaræa* in which I suspect something unusual in the position of the embryo. It appeared to be curved round the inner convex side of the egg, with the head and tail meeting or approximating on the marginal or straight side. And so it is; but the incurvation of head and tail is *dorsal*, the venter of the embryo lying along the inner convex side of the egg. The embryo appears to be dead. I have taken it quite out of the mine, and the position of the mandibles and of the thoracic legs leaves no doubt concerning its very unusual position." Unless this position of the embryo can be explained as an exaggeration of what is sometimes met with in a minor degree, viz., a sort of spiral twisting of the larva upon its axis, it would indicate a mode of development the reverse of what was observed in all other cases, in which the doubled-up position of the embryo in the egg is brought about by the *ventral* incurvature and growth forwards (*i.e.*, towards the head) of the posterior extremity. In this connection I may mention that, having obtained some eggs of *Rumia cratægata* (114 from one moth) in June last, I took special notice of the development of the embryo with reference to this point, and to the theory

of Kowalevski mentioned in my former communication. The earliest eggs were laid on or about the 15th June. On the 28th, I noticed the first appearance of the eye-spots, and the first hatching took place on 2nd July. My note on 30th June runs as follows: "The eyespots from their earliest appearance occupy the same position relatively to the sharp end of the polar oval as they do in these advanced embryos (and which is their position up till hatching): consequently the aspect and orientation of the dorsal and ventral surfaces is constantly the same." That is, unless the embryo makes, more than four days before hatching, that revolution in the shell, asserted by Kowalevski for the Lepidopterous embryo in general, and which would necessarily bring its head from the one side of the shell to the other. The presumption, then, would be that the embryo of *R. cratægata* gets into the loop-form by such a ventral incurvature and forward growth of the tail-end as we have seen already in *Zaræa*, and as is described by Huxley in *Astacus*.

From the cocoons made last year by parthenogenetic larvæ (and of which I had 26 remaining over winter), I had this year, in the middle of April and beginning of May, three flies which were all females, and of which the first two (excluded in April), laid eggs abundantly, from which again I bred *doubly parthenogenetic* larvæ, that yielded me in June some 32 cocoons. Why I had no more than 3 flies from 26 cocoons may have been probably owing to the larvæ perishing in the others from being kept in too dry and warm a situation during winter. In *Nematus ribesii* the parthenogenetically-bred flies being all males, agamic reproduction in the case of that saw-fly is brought to a speedy termination in the second generation. The case is, from what appears so far, very different with *Zaræa*, which may possibly be capable of continuing the species agamically for an indefinite time. This is so much the more likely as the males of this saw-fly appear to be very rare. I have only met with one hitherto, excluded 8th June, out of 181 flies (and nymphs), 173 of which were bred from larvæ beaten out of snowberry in 1882. This male paired with a female much larger than itself immediately afterwards, and I have at present a few cocoons the result of this union.

Ichneumons, apparently of two species, made their appearance as usual, on the average a good deal later than the saw-flies, so that the larvæ of the latter might be grown enough to receive their eggs, a *Zaræa* larva nourishing only one ichneumon by which it is entirely consumed. Besides the Hymenopterous parasites, I found also one Dipterous cocoon, which, however, has not excluded any fly hitherto.

There is just one more circumstance I may mention regarding the *Zaræa* larva, and that is, that at all stages pressure causes it to eject a clear liquid, apparently from the spiracles or that neighbourhood, which appears as a row of clear beads along the side of the larva, and is not, I should say, a mechanical result of the pressure, but a voluntary resentment of it.

Milford, Letterkenny, Ireland :

22nd Oct., 1883.

A PROPOSED ARRANGEMENT OF THE BRITISH *JASSIDÆ*.

BY JAMES EDWARDS.

In the Catalogue of British *Hemiptera* published by the Entomological Society of London, the *Jassidæ* are divided into seven genera. Three of these, namely, *Gnathodus*, Fieb., *Graphocrærus*, Thoms., and *Doratura*, J. Sahlb., are intelligible, but the remainder seem to be capable of some improvement in the definition of the characters to be assigned to each, and the species to be included therein. So far as I can make out, most recent authors have agreed that the genus *Athysanus*, Burm., is chiefly to be distinguished by the suture of the elytra being straight throughout, not, or scarcely, overlapping at the apex, and the appendix to the membrane either entirely wanting or extremely narrow; but of the fifteen species given in the Catalogue above quoted, only eight possess these characters, five of the others having the elytra distinctly overlapping at the apex, and an ample appendix to the membrane, while *nervosus*, Fall., pertains to the genus *Paramesus*, Fieb., and *canescens*, D. and S., I propose to treat as the type of a new genus of equal value with *Graphocrærus*, Thoms. The more important characters of this new genus are as follows :

GLYPTOCEPHALUS, *g. n.*

Broad, parallel-sided. Head, including the eyes, wider than the pronotum. Vertex sub-angularly produced, its length down the centre rather more than twice that of the inner margin of the eye, its disc distinctly but shallowly punctured, the interstices very finely scratched; just within, and running parallel to, the anterior margin is a distinct groove, and beyond this the surface is raised, and strongly rugose, parallel to the anterior margin. Frons extremely finely punctured, with regular rows of coarse punctures running parallel with its upper margin, especially in its upper part. Length of the side margin of the frons below the antennæ a trifle shorter than the clypeus. Loræ each as wide as the clypeus. Pronotum strongly transversely rugose, except near its anterior margin, its sides very short. Elytra (♂)

leaving the apex of abdomen uncovered, not overlapping at the apex, sub-corneous with an irregular, very shallow, punctuation, membrane with an extremely narrow appendix. Wing-nerves as in *Thamnotettix*.

My view of the generic distribution of our British species may be concisely expressed in the following table :

JASSIDÆ.

- 1 (22) Vertex not angular in front.
- 2 (9) „ impressed.
- 3 (8) „ sub-angularly produced.
- 4 (7) „ with one transverse impression.
- 5 (6) Impression straight, reaching from the anterior angle of one eye to that of the other *Doratura*, J. Sahlb.
- 6 (5) Impression parallel with the anterior margin throughout
Glyptocephalus, g. n.
- 7 (4) Vertex with three impressions, two (oblique) at the posterior margin, and one (transverse) in front *Graphocrærus*, Thoms.
- 8 (3) Vertex sub-lunate, transversely rugulose in front *Paramesus*, Fieb.
- 9 (2) „ plane or slightly convex, not impressed.
- 10 (19) Elytra overlapping at apex.
- 11 (16) Outer cubital nerve well defined.
- 12 (15) Side margins of pronotum of moderate length, separated from prosternum by a sharp keel.
- 13 (14) Elytra with several irregularly disposed white transverse nerves...
Allygus, Fieb.
- 14 (13) Elytra without irregularly disposed white transverse nerves ..
Thamnotettix, Zett.
- 15 (12) Side margins of pronotum extremely short, keel obsolete or wanting ..
Limotettix, J. Sahlb.
- 16 (11) Outer cubital nerve obsolete or wanting.
- 17 (18) First wing-nerve and upper branch of the second separate at their junction with the sub-marginal nerve *Cicadula*, Zett.
- 18 (17) First wing-nerve and upper branch of the second concurrent near the apex, and running into the sub-marginal nerve as one nerve...
Gnathodus, Fieb.
- 19 (10) Elytra not overlapping at apex.
- 20 (21) Side margin of frons below the antennæ nearly straight, as long as, or longer than, the width of the frons between the antennæ ..
Stictocoris, Thoms.
- 21 (20) Side margin of frons below the antennæ curved outwards, much shorter than the width of the frons between the antennæ ... *Athysanus*, Burm.
- 22 (1) Vertex angular in front.
- 23 (24) Frons flat, very narrow, at least three times as long as its width between the antennæ *Platymetopius*, Burm.
- 24 (23) Frons convex, not more than twice as long as its width between the antennæ *Deltocephalus*, Burm.

With regard to the genus *Allygus*, Fieb., it may be remarked that the characters given in Ent. Mo. Mag., xii, p. 170, require amendment,

with reference to the genitalia, because in *commutatus*, Fieb., the genital plates so far from being elongate, are very short, so short in fact as to leave the inner genital processes exposed.

The species to be included in the genera *Thamnotettix*, *Limotettix*, and *Athysanus*, as defined above, will be as follows:—

THAMNOTETTIX: *dilutior*, Kbm., *prasinus*, Fall., *subfuscus*, Fall., *stupidula*, Zett., *striatula*, Fall., *cruentata*, Panz., *torneella*, Zett., *splendidula*, F., *crocea*, H.-S., *attenuata*, Germ.

LIMOTETTIX: *striola*, Fall., *intermedia*, Boh., *nigricornis*, J. Sahlb., *4-notata*, Fab., *virescens*, Fall., *frontalis*, H.-S.

ATHYSANUS: *brevipennis*, Kbm., *griseus*, Zett., *sordidus*, Zett., *russeolus*, Fall., *irroratus*, Scott, *piceus*, Scott, *obsoletus*, Kbm., *plebejus*, Fall., *obscurus*, Kbm., *melanopsis*, Hardy.

Preysleri, H.-S., belongs to a group which differs so much from all the other species that I have thought it better to retain it in Thomson's genus *Stictocoris*, rather than to tack it on to *Athysanus*. I may shortly send a descriptive notice of *T. stupidula* to this Magazine.

Swiss Cottage, Rupert Street, Norwich:

9th November, 1883.

NATURAL HISTORY OF *ZYGÆNA EXULANS*.

BY WILLIAM BUCKLER.

When Dr. F. Buchanan White, in company with Prof. J. W. H. Traill, in July, 1871, discovered this to be a British species located on a hill in Braemar, as related in this Magazine (vol. viii, p. 68), he very kindly sent to the Rev. J. Hellins, and to me, some eggs at the beginning of August following.

The larvæ hatched on August the 8th, and in absence of any knowledge of the nature of their food, were tried with heather and other low plants, but they chose to eat only of *Lotus corniculatus*, and throve on it, moulted once, and fed on again till the 8th of September, when they fixed themselves for hibernation; but in course of the ensuing winter they were unfortunately attacked by mould, and perished one after another, the latest in February, 1872; and I have since learned from Mr. Hellins that his had met with a similar fate.

Naturally enough, as time went on I hoped the full grown larva would eventually be found, and its local food plant ascertained with certainty, in its northern habitat, by some enterprising collector who would perhaps afford me the opportunity of figuring it; although this has not happened from Braemar, yet now, after the lapse of eleven

years, I find myself in possession of sufficient materials for completing what I had, through the kindness of Dr. Buchanan White, so long ago begun.

For most of what follows I have been indebted to the very kind help I have had the pleasure to receive from Mr. George T. Baker, and his friend Dr. Jordan of Edgbaston, both having supplied me with numerous examples of the larva of *exulans*, in different stages of growth, together with their observations of its habits, taken in 1882-3 during their summer visits to the Swiss Alps.

Two series of the larvæ in fours reached me on July 13th, 14th, and a single larva on the 16th; these were forwarded by Dr. Jordan from Zermatt, having been found by him at an altitude of about seven thousand feet, at the Schwarzen See near by, feeding, while nearly buried in the tufts of leaves of *Silene acaulis*, and often quite buried in the fleshy mass of *Cherleria sedoides*, where they seemed to have eaten out their own shape, some were also seen to be feeding on *Trifolium alpinum*, *Geum montanum*, *Sibbaldia procumbens*, and *Alchemilla alpina*.

Some of these larvæ had spun themselves up, and their cocoons got ruptured, and the half-formed pupæ had fallen out during their journey hither, while others arrived in very perfect and lively condition, from which I secured figures and descriptions; two much smaller than the others fed but very little, and in August, laid up motionless for hibernation; one of these became attacked with mould in September and died, but the smallest of the two slept safely through autumn and winter until the 19th of April, 1883, when it began to crawl about rather feebly in quest of food; it was then supplied with a small spray of *Medicago lupulina* and a leaf of *Rumex acetosa*; next day I could see it had partaken of both, though sparingly; afterwards it ate of *Trifolium repens* and *pratense*, lapsing occasionally into slumber until the end of the month, when it died, probably from the necessity of changing the leaves having disturbed it while waiting to moult; thus, in one state or another, all the above mentioned died off.

This year, in June, the same two friends were in Switzerland together, and while walking over the south side of the Great St. Bernard, where some of the snow had melted (later than usual), they found hundreds of the larvæ of *exulans* feeding in the sunshine on *Silene acaulis* and *Alchemilla alpina*; a great number of them were brought home by Mr. Baker, who most kindly sent to me on 6th of July seven very fine larvæ in perfect condition, besides three that had already spun up in cocoons in boxes before his return, and mentioned

then the apparent liking of the larvæ for water, as he had watched them closely, and seen instances of their approaching water and drinking it, and one larva actually crawling in a tiny pool, as though enjoying its miniature bath in the hot sunshine ; this of course led to the experiment of my sprinkling an occasional drop or two of water over the food of four of my larvæ for a few days, but only with disastrous result, as the four water drinkers died from an efflorescence of mould on their coats ; the remaining three lived some days longer and fed but sparingly, chiefly on leguminous plants, until each in turn died, the last on the 15th of July.

On 17th of July I bred the moth from one of the three cocoons, one only, a poor specimen and slightly crippled, yet not enough to interfere with its identification, and I hailed its appearance with great satisfaction.

Here I think I may be allowed to mention, that with Mr. Baker several of his larvæ of *exulans* spun their cocoons, but died within them unchanged ; while from a few that succeeded in effecting their change to pupæ he only obtained three moths, and all dwarfed, in fact, one of them was scarcely more than half the size of a fine Swiss specimen.

Possibly such poor results, with larvæ having the reputation of being polyphagous, may yet have been from the want of their accustomed alpine plants, or else must be attributed to the great difference of our climate from that of their habitat in Switzerland at so great an altitude, and though this is not more than half as great in Scotland, it should be borne in mind that Braemar is a little more than eleven degrees of latitude farther north, and the habitat of *exulans*, as Dr. Buchanan White has said,* “is probably covered with snow from November to April each season.”

The egg of *exulans* is of large size for that of the insect, and of long cylindrical round-ended shape, having a depression bending inward rather irregularly on one side, the shell is very thin and very slightly reticulated all over, in colour ochreous-yellow, changing to orange-ochreous, and finally to dark greenish-slate colour, very shining from the first to last.

When first hatched, the larva is a plump sausage-shaped little creature of yellowish olive-green colour most minutely dotted with black, having a row of sub-dorsal dull orange blotches, a black shining head, the usual warts black, each with a longish rough but pointed black bristle, the skin rather pubescent.

* The Entomologist's Annual for MDCCCLXXII, p. 113.

After moulting, the minute dots being not so black, it appears much paler coloured, more of a drab tint showing dark sub-dorsal markings, but as the larva grows, and becomes about three weeks old, it is then dark olive-green on the back, a lighter green on the sides, and has a sub-dorsal row of dark brown tubercles and beneath them a faint stripe of yellowish, the bristly hairs blackish-brown.

Just before it begins to hibernate about the 10th of September, it has grown to a length of nearly two lines, and of very stout proportion, the colour dark olive-green having an interrupted black sub-dorsal stripe, and below this at the end of each segment is a transverse oval spot of orange-yellow, the surface of the skin generally is much covered with little fascicles of black hairs.

In the following spring, after moulting, it soon is of the length of three and a half lines, and its colouring is a little fresher and darker; by the time its length has come to measure from four to five lines the back and sides are very dark green, and so much covered with black bristly hairs radiating from tubercular eminences as to appear blackish-green in comparison with the belly which is olive-greenish-yellow, the dorsal marking is velvety-black, the deep yellow side-spots enlivening the general darkness.

Towards the end of June and beginning of July it has reached its blackest stage, for it is then intensely and beautifully black which gives additional brilliancy by force of contrast to the light greenish-yellow side spots, the head is black and shining, the second segment green and smooth in front, the segmental divisions when stretched out show greenish and glisten a little, but all the rest of the upper surface is thickly covered with black hairs.

The full grown larva is from 7 to 8 lines in length, sometimes more, and nearly 3 in breadth, of elliptical figure, but with the head small and retractile within the second segment, and this also being in part retractile is twice as long as any of the others and tapering in front, the anal segment is slightly tapered and rounded off behind; all the segments are plump and cut extremely deep; the head is black and glossy, with green upper lip edged with black, the antennal papillæ whitish tipped with black, the front retractile half of the second segment is green and naked, the other half and on all the other segments of the body the ground colour of the back and sides is very dark green, along each side is a broken velvety-black stripe interrupted at the end of each segment beyond the second or third by a bright yellow elliptical transverse spot, each segment bears a series of ovate tubercular eminences thickly studded with short black radiating bristles

and a single long and fine hair, these almost or quite hide the green ground of the upper surface of skin, the spiracles are black, the smooth naked belly is of a green, rather less dark than that of the back, the anterior legs are black and shining with light green joints on the outer side and light green inner surface, the ventral and anal legs are of a lighter green than that of the belly and semi-transparent.

The cocoon is about 7 or 8 lines in length, and from $3\frac{1}{2}$ to 4 lines in width, somewhat fusiform, rising convexly in the middle, bluntly rounded off and rather flattened at each end to the surface on which it is spun (generally some rock or stone); it is usually very smooth, though sometimes a few slight longitudinal wrinkles are towards the front or roundest end; it is of a light pearly-greyish tint having more or less of a silvery lustre, and after the moth has escaped is semi-transparent.

The pupa, is from $5\frac{1}{2}$ to $6\frac{1}{2}$ lines long, and sometimes works its way quite out of the cocoon before the moth is disclosed; it is of the usual *Zygæna* form, with long antenna- and leg-cases free nearly their whole length, the shortish wing-covers with nervures in strong relief have their margins prominent from the body, the abdomen tapers just towards the rounded-off tip, and across the back of each ring anteriorly is a narrow ridge thickly set with most minute hooks pointed backward; the colour is blackish-green on the abdomen and all the other parts black, and with rather a dull surface.

Emsworth : October 30th, 1883.

DESCRIPTION OF THE LARVA OF *CRAMBUS INQUINATELLUS*.

BY G. T. PORRITT, F.L.S.

At the end of April last, Mr. W. H. B. Fletcher sent me about two dozen larvæ of a *Crambus* he had found about grass-roots, at Worthing, but the species he did not know. I placed them in a pot of growing grass, where they formed slight silken galleries near the roots on the surface of the soil, in which they lived during the day, and apparently coming out and feeding on the grass stems only at night. During May, I lost sight of them, and judged they had all gone below the soil to pupate. Through June and July, I anxiously awaited the emergence of the imagos, but none appearing, I quite gave them up as all dead, and was, therefore, very agreeably surprised at quite the end of August and early in September, to breed from them a nice and varied series of *C. inquinatellus*.

Length, about three-quarters of an inch, and fairly stout in proportion; head narrower than the second segment, the lobes full and rounded, and both it and the

frontal plate highly polished. Body cylindrical, and tapering a little towards the extremities: there is a slight transverse depression on each segment, and these, together with the deeply cut segmental divisions, give the skin a wrinkled appearance. Tubercles very large and prominent, and are, as well as the whole surface of the body, rather glossy, though not so much so as the head and frontal plate.

The ground-colour varies in different specimens from dull purplish-brown, to an equally dingy greyish-green, but the purple-tinted forms predominate; head very dark sienna-brown, the depth of colour varying in different specimens; frontal plate paler, and partaking more of the colouring of the dorsal surface; the dark pulsating alimentary canal forms the dorsal line, but there are no perceptible sub-dorsal or spiracular lines. The large tubercles correspond to the ground-colour, but are much darker in tint; spiracles very small, black.

Ventral surface and pro-legs of the ground-colour of the dorsal arca, but the legs, until towards the base, very dark sienna-brown.

Huddersfield:

November 7th, 1883.

DESCRIPTIONS OF NEW SPECIES OF *HETEROCERA*.

BY HERBERT DRUCE, F.L.S., F.Z.S.

The following descriptions are all from specimens in my own possession. The collection lately sent home by Mrs. Monteiro contained, besides those that I have described as new, several interesting species, such as *Darapsa rosæ*, *Saturnia Wallengreni*, &c.

Family AGARISTIDÆ.

ÆGOCERA AFFINIS, *sp. n.*

Primaries the same as *Æ. fervida*, Walker, excepting that the costal margin is broadly white nearly to the apex, and the fringe white instead of yellow. Secondaries pale chrome-yellow, the apex broadly bordered with reddish-brown, head and thorax reddish-brown, abdomen yellow. Expanse, $1\frac{3}{4}$ inch.

Hab.: Manboia, East Central Africa (*Last*).

A very distinct species, easily separated from *Æ. fervida*, Walker.

ÆGOCERA TRICOLOR, *sp. n.*

Primaries black, thickly speckled with greyish scales, a large, cream-coloured, oval-shaped band beyond the middle, extending from the costal margin to the anal angle, a cream-coloured stripe from the base to the middle of the wing, parallel with the inner margin, both the pale markings bordered with a narrow black line, and on the outer margins by faint metallic lines. Under-side orange, with the costal, outer and inner margins, also a central band, all black, a small black dot at the end of the cell. Secondaries deep chrome-yellow, with a broad marginal black band, the fringe white. Head and antennæ black, thorax black, striped with grey and yellow bands. Abdomen black, the sides deep chrome-yellow. Expanse, $2\frac{1}{4}$ inch.

Hab.: East Africa (*Mrs. Monteiro*).

This fine insect is allied to *Æ. Trimenii*, Felder, but it is very distinct.

PHÆGORISTA PALLIDA, *sp. n.*

Primaries dark brown, the costal half pale brown, a straight white band crossing the wing from the end of the cell to the anal angle, dividing the dark brown patch which extends almost to the apex. Secondaries bright orange-red, with a broad marginal brown band, widest at the apex, the inner margin pale brown, speckled with reddish scales. Head, antennæ, thorax, and abdomen brown. Under-side of primaries blackish-brown, crossed beyond the middle by a wide white band. Secondaries the same as above. Expanse, $2\frac{1}{4}$ inch.

Hab. : Ogowai, East Central Africa.

Family CHALCOSIIDÆ.

ANOMÆOTES THYMIATHIS, *sp. n.*

Primaries and secondaries semi-transparent yellowish-white, the apex of the primaries and the nerves dusky, the fringe pale brown. Antennæ of the male black, deeply pectinated. Head, thorax, and abdomen yellowish-brown. The female does not differ from the male excepting that the antennæ are not nearly so deeply pectinated. Expanse, $1\frac{1}{4}$ inch.

Hab. : East Africa (*Mrs. Monteiro*).

This species is allied to *Anomæotes levis*, Felder, from South Africa.

Family PERICOPIDÆ.

ALETIS MONTEIRONIS, ♂, *sp. n.*

Primaries pale buff, with the apical half black, including a large transverse white patch, and three posterior white spots, the third very minute. Secondaries with a broad marginal black band, which includes a series of white spots. Head and antennæ black, the antennæ very deeply pectinated. Palpi pale yellow, very small and erect. Thorax and abdomen black, with three rows of white spots, the under-side of the abdomen pale yellow, the legs brownish-black. The female only differs from the male by having simple antennæ. Expanse, ♂, $2\frac{1}{2}$; ♀, $2\frac{3}{4}$ inches.

Hab. : East Africa (*Mrs. Monteiro*).

Family LITHOSIIDÆ.

BIZONE RUBRIFASCIATA.

Primaries dark red, crossed by three bands of white, bordered on each side by narrow black lines, the first band is close to the base, the second crosses the middle of the wing, enclosing a black dot at the end of the cell, the third band close to the apex is much dentated on the outer margin. Secondaries brownish-black, with the fringe white; head white; thorax bright red; abdomen black; legs brown, speckled with white. Expanse, 2 inches.

Hab. : North Celebes (*Curtis*).

This fine insect is the largest of this genus; it is very distinct from any that I am acquainted with.

Family NYCTEMERIDÆ.

NYCTEMERA FULLERI, *sp. n.*

Primaries dark brown, with all the nerves pale yellow, excepting near the apex, a wide transverse white band crossing the wing beyond the middle, from the costal margin to near the anal angle; under-side the same as above, with the basal third pale yellow. Secondaries pale yellow, shading to dark orange-red at the base and inner margin, the outer margin broadly banded with black at the apex. Head, thorax, and abdomen yellowish-brown, the abdomen with a central row of black spots. Antennæ black; legs brown. Expanse, $2\frac{1}{4}$ inches.

Hab.: West Africa, Cameroons.

London: October, 1883.

ON THE SPECIES OF EUROPEAN CRAMBI MORE OR LESS ALLIED
TO *C. MARGARITELLUS*.

BY GEORGE T. BAKER.

Continuing my former notes on this group of the *Crambi* (vol. xix, pp. 239—244), I will now conclude by describing those European species with the white longitudinal stripe undivided, first shortly tabulating them as before.

C. Longitudinal stripe widening perceptibly hindwards.

margaritellus and *pyramidellus*.

Ground-colour more or less shaded with dusky markings...

margaritellus.

Ground-colour unicolorous, stripe reaching almost to the hind-margin *pyramidellus*.

D. Longitudinal stripe of almost uniform width.

latistrius, *vectifer*, *furcatellus*, *radiellus*, *fulgidellus*.

Hue of ground reddish-ochreous, stripe extending through the fringe *latistrius*.

Hue of ground dusky brown, stripe very thinly divided near hind margin *vectifer*.

Ground-colour uniform olive, stripe shorter and narrower ..

furcatellus.

Ground-colour uniform ochreous, stripe nearly reaching hind margin *radiellus*.

Hue of ground pale reddish-ochre, stripe extending up to hind margin *fulgidellus*.

MARGARITELLUS, Hb. ($21-22\frac{1}{2}$ mm.).

Fore-wings pale fuscous-yellow, lighter beneath the stripe, which is shining white, widening perceptibly outwards, with its posterior margin slanting very obliquely from the apex towards the base of the wing; in some specimens the anal

angle of this stripe is visibly toothed, but this is not constant. The hind-margin of the fore-wing has a distinct dark brown border, and the fringes are grey, slightly shining, with a dark dividing line. The hind-wings are pale grey, having a darker border with almost white fringes. Head and central part of thorax white. Palpi brown; white above. Patagia very pale buff. Body similar to hind-wings.

British specimens of this insect often differ considerably from those taken on the continent, insomuch, that in his "Genera et Species Chilonidarum and Crambidarum," Zeller says, "Varietas anglica tam singularis est, ut pro specie distincta habuerim; Stainton (Manual ii, p. 183) eam non distinguit," the hue of the fore-wings being almost unicolorous ochreous-brown, with the hind-wings much darker grey, this latter feature being particularly noticeable in some specimens I have from the English lakes. I have, however, some sent me from Perthshire, which present very little difference from continental examples. This species is very generally distributed throughout Switzerland: we have taken it at Aigle, in the Rhone Valley, on June 24th, 1880, and it is by no means uncommon in a little salt-marsh near the lake of Thun.

PYRAMIDELLUS, Tr. (27—30½ mm.).

This very fine *Crambus* is the largest of Divisions C and D. The ground-colour is ochreous-cinnamon, almost unicolorous, with a shining, white, longitudinal stripe, increasing in width as it approaches the hind-margin, the basal half being of moderately uniform width, but near the middle it suddenly diverges towards the inner margin and widens very considerably to its termination, which is less oblique than in *margaritellus*, being of a rather rounded form; its anal angle is also sometimes toothed. Above this stripe, near the apex of the wing, there is an indistinct dark dash, above which, on the costa, is an indication of a light tooth. The basal half of the inner margin of the wing is bordered by a fine white line, reaching nearly to the centre. The hind-margin is darkly dotted, and the fringes are brown, intersected with white, and having a dark dividing line. The hind-wings are brownish-grey, lighter towards the base, the outer margin is bordered by a darker line. The fringes are whitish, with the usual dividing line.

Head, collar, and central thoracic line white. Palpi brown, white above. Patagia same hue as fore-wings, body similar to hind-wings.

I have never taken this handsome species myself, but it is by no means uncommon among the Swiss Alps, whence all my specimens were sent me.

LATISTRIUS, Hw. (24—26 mm.).

The fore-wings are shining ochreous-brown, tinged with red, with the shining white stripe reaching to the extremity of the fringe, bordered above by a dark line, the ground-colour is paler by the inner margin, and the hind margin is darkly dotted. The fringes are grey, intersected with white, having a darker divisional line. The hind-wings are greyish-white, with white fringes that have an indistinct dividing line.

The head, palpi, collar, and central part of thorax are whitish, the patagia are similar to fore-wings, but paler, and the body as the hind-wings.

This local insect is commoner in England than most parts of the continent.

I have this from Canterbury, and it is, or, perhaps, I should say, was, not uncommon in some marshy ground by the Warren, near Teignmouth.

VECTIFER, L.

This is an insect of very restricted range, being, according to Dr. Staudinger's catalogue, confined to Sicily and Dalmatia, and I have not been fortunate enough even to see a specimen of this rare *Crambus*. I can, therefore, only give a translation of the description in Zeller's "*Chilonidarum and Crambidarum Genera et Species*," which is as follows:

"Collar and fore part of the thorax snowy-white, with the palpi on the outside grey, and irrorated with dusky (fusco), anterior-wings elongated, rather acute (sub-acutis), brown, with the middle stripe of nearly equal width, thinly divided before the posterior margin, not extending into the fringes, fringes shining grey, hind-wings pale grey, ♂."

"Very like *bisectellus* (a New Zealand species), but it has the wings not acuminate, and the stripe only once divided. From *monotaniellus* (a species from Asia Minor) it differs in this, that the stripe besides being divided is not prolonged into the fringes; from *sublicellus* (a New Zealand species), in the stripe not being toothed above, and the fringes not tessellated. Collar snowy-white, palpi scarcely as long as the thorax, attenuated, grey above, sprinkled with dusky, with the base white beneath. Antennæ serrated, scarcely setaceous. Fore part of thorax white in the middle, but the remainder yellowish-grey. Legs on the side from (the body) white, on the side next (the body) dusky grey. Tibiæ and tarsi of the hind-legs grey. Abdomen bluish (lividum), at the base white. Anterior-wings dusky-brown, $5-5\frac{1}{2}$ " long, elongated, posteriorly widened gradually, moderately acute, with the hind margin rounded. The central stripe rather narrow, snowy-white, until it arrives at the very posterior margin, and touches it above the centre. The upper margin (of the stripe) straight and narrowly bordered with fuscous, lower border less straight; but the shape of the upper part is not constant: for in one specimen it is somewhat narrowed before the margin. Not far from the margin a narrow brown line (in that specimen ending in a point) cuts its obliquely, and with its direction so changed that it would form an acute angle, ascends to the costa. There are little black dots on the posterior margin, the fringes are shining grey, and have on the base at the end of the stripe three scarcely perceptible small black dots. Posterior-wings pale grey, somewhat dusky towards the apex, fringes greyish-white. On the under-side the fore wings are dusky grey, with the dorsal portion paler, and with the posterior part of the costa narrowly edged with ochreous. Hind-wings even paler than upper-side."

FURCATELLUS, Zett. (22—24 mm.).

The fore-wings are uniform olive-brown, much darker in some specimens than others. The white stripe is narrower and shorter than in the rest of Division D, in

which (stripe) there is a slight depression just beyond the centre, whence it rises somewhat towards the hind-margin. Sometimes this stripe is scarcely more than a line, at others it widens a little beyond the depression, and its posterior edge is very jagged. The fringes are paler brown, in the ♀ white, and have an indistinct dividing line. The hind-wings are uniform greyish-brown, with rather lighter fringes, which also have an indistinct dividing line.

Head, collar, thorax, palpi, and antennæ of same colour as the fore-wings, body as the hind-wings.

This is one of the rarest of our British *Crambi*, and is taken at a considerable altitude, being recorded from Snowdon, the lake district, and the Scotch Highlands. In Switzerland it is by no means uncommon, and most of my specimens were taken there; it is not rare on the G rner Grat at Zermatt.

RADIELLUS, Hb. (25—27 mm.).

The fore-wings are ochreous-brown, slightly suffused with a greenish lustre, the white stripe is of moderate width, reaching nearly to the hind-margin, and being toothed several times on its inner edge, in some specimens it terminates in a fine point. There is a short, fine, white line on the fold, and the inner margin of the wing is edged with white from the base to about the centre. The fringes are brownish, slightly shining, intersected with white, and have a darker dividing line. The hind-wings are grey, with paler fringes with a darker dividing line.

Head and palpi pale brownish-white. Antennæ, collar, patagia, and thorax similar to the fore-wings. Body as the hind-wings.

This can easily be distinguished from the preceding species by the lighter colour, and the lustre of the anterior-wings.

In Switzerland, this insect is not rare, last year we found it flying about a meadow bordering the pine woods on the Riffel, at Zermatt, in the beginning of July.

FULGIDELLUS, Hb. (24½—28 mm.).

In this beautiful *Crambus*, which I have not seen alive, the ground-colour is pale ochreous-brown, slightly tinged with rufous. The white longitudinal stripe is of uniform and moderate width, somewhat curved, and reaches up to the hind-margin, it is also perceptibly toothed several times on its inner edge beyond the middle; there is a white line just below the fold, extending from near the anal angle to rather beyond the middle of the wing, the inner edge is also edged with white from the base to about the centre; the hind-margin is dotted with dark brown, and the fringes are pale brown, intersected with white, having a dark dividing line. The hind-wings are shining white, with a slight tinge of reddish ochre by the apex, and have white fringes with an indistinct dividing line.

Head, collar, and central thoracic line white, palpi brown, edged above with white. Patagia and antennæ same colour as fore-wings. Body greyish, almost white.

I have specimens of this from North Germany, and also from Spain, where it is by no means uncommon.

Augustus Road, Edgbaston:
September 19th, 1883.

THE DISTINCTIVE AND SEXUAL CHARACTERS OF *CHRYSOPEA FLAVA*, SCOPOLI, AND *CH. VITTATA*, WESMAEL.

BY ROBERT McLACHLAN, F.R.S., &c.

I have more than once been asked by friends, interested in European *Neuroptera*, whether I did not consider it possible that the two species of *Chrysopa* above-named (both tolerably common in Britain) might not be only *sexes* of one species distinguished by the form of the costal margin of the anterior-wings. My reply has always been to the effect that I believed them to be distinct, and that I had the sexes of both. This I felt sure of; but it is only this moment that I have become aware of a remarkable difference in wing-details in the sexes of *Ch. flava*, and in calling attention to this I will allude to the specific characters:—

CH. FLAVA.

Costal margin of anterior wings *excised* in both sexes. In the ♂ the margin is much elevated at the base, and then *almost suddenly depressed*, so that the costal area is wide at the base and then becomes *almost suddenly very narrow*. In the ♀ the excision is *shallow and very gradual* (sometimes almost imperceptible), so that the costal area *narrows gradually*, and not suddenly.

In the ♂ the costal nervules are *much incrassated* from the point where the costal area becomes suddenly narrowed. In the ♀ these nervules are *slender* the whole length of the area.

Superior anal appendages of ♂ long and stout, subcylindrical, the obtuse tips curved upward and inward; *they are as long as, or longer than, the inferior appendage*, which latter is in the form of a very broad triangular plate, concave within, the apex somewhat suddenly acuminate, turned upward between the tips of the superior appendages, and ending in a tuft of stiff hairs.

I am not able to give anal characters for the ♀, but distinctive points probably exist in the fresh insects.

The nomenclature is that adopted by Hagen, and I think it would be unwise to alter it, but it seems to me impossible to exactly define

CH. VITTATA.

Costal margin of anterior wings *nearly straight* (or slightly convex) *in both sexes*, the costal area narrowing gradually.

In *both sexes* the costal nervules are *all slender*.

Superior anal appendages of ♂ *much shorter* (only about half the length of the inferior appendage), stout, irregularly sub-cylindrical, dilated externally in the basal portion, with a constriction before the apex, the tips turned inward but scarcely upward. Inferior appendage similar to that of *flava*, but narrower, the acuminate apical portion longer.

what Scopoli intended by his "*Hemerobius flavus*," and Wesmael's *Ch. vittata* apparently included both species according to the types, but his description applies to the species now so-named.

It appears to me that the two species were generally confused by authors up to, and including, Schneider. The latter author, in describing and figuring *Ch. vittata* (which is now considered a synonym of *flava*) alludes to the excised costal margin as a sexual character of the ♂, and says nothing about the condition of this margin in the ♀, leaving it to be inferred that it is *not* excised in that sex. His description agrees with the condition seen in the ♂ of *flava*, but his figure appears to have been taken from a ♀. Neither he, nor any other author, so far as I am aware, has noticed the *thickened costal nervules* that form so prominent a feature in the ♂ of *flava*. Rambur, in describing his *Hemerobius proximus* (= *vittata*) well describes the anal part of the ♂ of *vittata*.

Ch. flava and *vittata* are two good and distinct species. *Ch. flava* differs from *vittata* in the excised costal margin of both sexes, but the amount of excision is much greater in the ♂ than in the ♀, and in the ♂ most of the costal nervules are thickened. The two species also differ conspicuously in the length and form of the superior appendages of the ♂. Some other points, such as length of basal joint of antennæ, &c., alluded to in my "British Neuroptera-Planipennia," are probably too vague and uncertain to be of much service. The coloration of the nervules is not sufficiently stable to be of much use in definition; in three examples (1 ♂, 2 ♀) of *Ch. flava* from Central Italy, the two series of gradate nervules are conspicuously black.

I am of opinion that the ♂ of both species is much less common than the ♀.

Ch. flava is recorded by Hagen (Neurop. N. America) from Philadelphia; I have never seen an American specimen. A species somewhat intermediate between *flava* and *vittata* occurs in Japan.

This article owes its origin to an examination of the examples of *flava* from Central Italy, in the course of which I was struck by the black gradate nervules in those specimens, and by the thickened costal nervules of the ♂, which, together with the different form of the costal margin in that sex, I had not previously noticed, and, as is often the case under similar circumstances, my first impression was that I was dealing with a new species.

The anal appendages of the ♂ are probably more developed in

the group to which these species belong than in any other, and if the present unwieldy genus "*Chrysopa*" be hereafter disintegrated (as I think it most undoubtedly will), it is possible that the importance of the fact will not be overlooked.

Lewisham, London :

8th November, 1883.

NOTES ON DIPTERA.

BY J. E. FLETCHER.

Some time ago, Mr. J. B. Hodgkinson kindly sent me a few specimens of a small yellow *Trypeta*, which was new to me, with the information that they were bred from larvæ which mined the leaves of *Impatiens noli-me-tangere*. I submitted a specimen to Dr. Meade, who obligingly informed me that he could detect no difference between it and *Trypeta alternata*, Fall., the hip-feeder. I have recently had the means of comparing the *Impatiens*-feeder, with the hip-feeder, having bred the latter last May, and need not say that where Dr. Meade detected no difference I fail to see any. As these are diverse foods for the larvæ, I should be glad if observers, having access to the *Impatiens*, would ascertain and make known the time during which the larva feeds ; the kind of mine it makes ; whether it pupates in the mine or descends to earth ; and the time of emergence of the imago.

As I walked in a country road near here, about the middle of August, I was struck with the sight of a small insect with what seemed a long straw-coloured tail, flying slowly and deviously about four feet above the road. Slackening my pace, and watching the creature, I observed it turn towards the foot-path, and alight some three feet in front of me, dropping its "tail" when about three inches from the ground. Approaching sufficiently near, I stooped down, and could then see that the creature was a large *Sarcophaga*, but having no means of capturing it, I am unable to indicate the species. Its "tail" was a piece of hay-stem, some $2\frac{1}{2}$ inches long.

For several years past I have grown a patch of shallots, being uniformly successful with them until last year, when they were moderately attacked by *Diptera*, which, however, I was glad to find, as I was desirous of breeding them. I noticed two species of larvæ, one much larger than the other, and when the imagos appeared in the autumn and following spring, they proved to be *Cyrtoneura stabulans*, and *Phorbia cepetorum*, Meade. This year, about a peck of shallots

were planted, which should have yielded a crop of, say, seven pecks; instead of which they yielded little more than a quarter of a peck, the rest having been utterly spoiled by larvæ of the Dipterous insects named.

Worcester: October, 1883.

The butterflies of Huntingdonshire.—No. 234 of this Magazine contained a list of Cambridge *Rhopalocera*. I beg to supply a list of those found in Huntingdonshire by myself and friends within the years 1882-3. 1, *Argynnis Paphia*, common; 2, *Aglaia*; 3, *Adippe*, rare; 4, *Euphrosyne*; 5, *Selene*; 6, *Melitæa Artemis*, rare; 7, *Grapta c-album*; 8, *Vanessa urticæ*; 9, *polychloros*; 10, *Io*; 11, *Pyrameis Atalanta*, very abundant; 12, *cardui*, not common, very abundant in 1879; 13, *Apatura Iris*, several in Monk's Wood; 14, *Melanargia Galathea*, common; 15, *Pararge Egeria*; 16, *Megæra*; 17, *Epinephele Janira*; 18, *Tithonus*; 19, *Hyperanthus*; 20, *Cænonympha Pamphilus*; 21, *Nemeobius Lucina*; 22, *Thecla quercûs*, common; 23, *W-album*; 24, *pruni*, rather rare; 25, *betulæ*; 26, *Polyommatus phlœas*; 27, *Lycæna Egon*; 28, *Icarus*, common; 29, *Adonis*, first time recorded, I believe, in this shire, captured by myself in 1882; 30, *Colias Edusa*, rare, very abundant in 1877, also variety *Helice*; 31, *Rhodocera rhamni*; 32, *Leucophasia sinapis*; 33, *Anthocharis cardamines*, common; 34, *Pieris napi*; 35, *rapæ*; 36, *brassicæ*; 37, *Aporia cratægi*, some time since; 38, *Hesperia malvæ*, common; 39, *Tages*; 40, *Paniscus*, not common; 41, *Sylvanus*, abundant; 42, *linea*, everywhere.

This is a good long list, and, I believe, compares favourably with any other county; in fact, I do not know where else such variety could be obtained in one shire. Monk's Wood is most famous for its valuable species, and adds considerably to the numbers. We must not forget that this county was the home of *P. Hippothœ*, and that *P. Machaon* was abundant in the fens, making a grand total of 48 different species. This is a large proportion out of the 62 British species, some of which are really unobtainable.

I am compiling a list of Huntingdonshire *Lepidoptera*, and shall be glad to receive names of authentic captures from residents in the county, or from friends who visit it.—HERBERT E. NORRIS, St. Ives, Hunts.: 5th November, 1883.

Capture of Laphygma exigua at Pembroke.—To my extreme surprise a rare *Noctua* has turned up at Pembroke. There had been two or three mild still nights, and stray specimens of *Epunda lichenea* and *Anchocelis lunosa* had come to the gas-lamps, but another storm was making its moan when I went out again on September 24th to look at the few lamps nearest home, and on one of them a *Laphygma exigua* was sitting. Whence it had come, and how far it had travelled in unavailing search for a mate (for it was a male, decidedly worn with travel, but not otherwise damaged)—or how far it would have carried on the fruitless quest, who shall guess? I feel rather glad that I turned out that night, and gave it a chance of some kind of appreciation.—CHAS. G. BARRETT, Pembroke: 23rd October, 1883.

Description of the larva of Semioscopis avellanella.—This larva appears to be unknown, or, at any rate, no notice of it occurs in entomological works. I have found it now for the last three years on lime bushes (*Tilia parvifolia*) in woods, in August and September, and this year in July as well. At first it rolls over the edge of the leaf, forming a narrow cylindrical chamber open at both ends, from which it protrudes and eats the adjoining parts, consuming the whole thickness of the leaf—a somewhat remarkable circumstance considering how small and tender the larva at this time is. Afterwards its habit changes, and it lives for the rest of its life under a web, on the under-surface of a leaf, to which it communicates a partial curve. Like most larvæ with such a habit, it is always on the alert, and very quick in its motions, so that unless care is taken in plucking the leaf out it tumbles and saves itself in the herbage below.

It is smooth, long, and slender, cylindrical, but tapering a little behind; active, with a quick, jerky walk. Head full and round, narrower than the second segment, green. Thoracic plate green. Divisions marked by a yellow skin-fold. Colour whitish-green, passing into bluish-green on the belly; when full-fed, turns to a uniform green. Dorsal vessel dark green and distinct, but of variable intensity, being in some specimens almost absent on the middle segments. There is no indication of clubbing in the third pair of legs. It spins a tough cocoon underground. The pupa is stout, red with green wing-cases, but changes, before winter sets in, to brown, in consequence of the early development of the perfect insect, after the manner of the genus *Tæniocampa*. The empty case remains within the cocoon after the emergence of the moth.—JOHN H. WOOD, Tarrington, Ledbury: Nov. 2nd, 1883.

Occurrence of Coleophora vibicigerella, Z. (a species new to Britain) in Essex.—Mr. William Machin has just sent me a specimen of this conspicuous, brightly-marked insect for determination. It was taken near Fobbing, in Essex, at no great distance from the salt-marshes, at the end of June last. It was obtained, as Mr. Machin writes, “from a hedge in the garden of a friend, about a yard from a large plant of *Artemisia vulgaris*. At the time of capture, I was, of course, unacquainted with the species and its food-plant. But on ascertaining from Mr. Warren that the insect was probably *C. vibicigerella*, of which the larva fed on *Artemisia campestris*, I returned to the spot with the intention of searching the plant of *Artemisia vulgaris*; arriving at my friend’s house I had the mortification of learning that he had cut down the plant about a month previously. I have well searched the hedges and fields in the neighbourhood, when I found plenty of *A. vulgaris*, but no trace of the larvæ of *vibicigerella*. I met with no plants of *Artemisia campestris*.” I may mention that *A. campestris* is a local plant, occurring, however, in great plenty in some parts of Suffolk and Norfolk. In H. C. Watson’s *New Botanists’ Guide* (1835), we read, under Suffolk, p. 118: “about Barton and Elden plentifully; and on Icklingham Heath, near Bury. *Eng. Fl.* At a place called Elden, two miles beyond Newmarket, towards Lynn, on the banks of corn-fields, and by the way sides abundantly, for a mile in length and breadth; also a mile from Barton Mills, on the way to Lynn, and among the furze-bushes under the hill. *B. G.*” And under Norfolk, p. 132: “about a mile from Thetford, on the road to Norwich, in great abundance. *B. G.*”

In the same author's *Cybele Britannica* (published in 1849), we have the further information, Vol. ii, p. 97: "It has occurred also on Hebburn ballast-hills, by the Tyne, doubtless introduced." I call attention to this, as it may possibly point to the chance of a casual introduction on the Essex coast.—H. T. STANTON, Mountsfield, Lewisham, S. E.: *November 16th, 1883.*

Habits of Sciaphila sinuana.—In the beginning of June, while looking among wild hyacinth for *Eupæcilia maculosana*, I noticed a flower head spun together, and a large *Tortrix* larva in the web. My idea at the time was that it was some larva which had dropped from the oaks overhead, and was spinning up on the hyacinth; I boxed it, however, with the flowers, and on looking at it again, a few days after, found that it had eaten the flowers, and was pupating. In due time, to my great delight, a fine female *sinuana* emerged. It may, probably (unlike some of its relatives), be a restricted feeder; which, with the sluggish habits of the imago, may account for its rarity. I took both sexes afterwards, but very sparingly. They have a decided habit of dropping down instead of flying, when beaten out. They were only in a few places, but invariably where hyacinths abounded. I beat most of my specimens from elders; perhaps chosen because the large leaves were good shelter, and near the ground. I never before beat anything from that tree worth looking at twice. In fact, there is so little to be got from it, that I very seldom beat it. Probably, the true habit of the moth is to rest among the brackens and low herbage, and not to fly until late, as I never took it on the wing. I took only one on a tree-trunk, a female. I also took a single example of *Tortrix cratægana*, a female. I suppose I must have been late for the species, as I did not meet with it again. *Tortrix sordiana* is fairly common among the oaks, and I also met with four *T. cinnamomeana*. *Penthina picana* occurs sparingly on birch trees; and among larches and Scotch firs I have taken *Spilonota lariciana*, *Mixodia Ratzeburgiana*, *Coccyx nanana*, and *Pædisca occultana*. The larva of *P. sordidana* is fairly common on the alders in the woods.—J. SANG, 181, Horninglow Street, Burton-on-Trent: *October 19th, 1883.*

Occurrence of Gelechia Hübnéri, at Burton.—I had the good fortune to come across this rare species in this neighbourhood. The specimens were taken at rest on the trunks of oaks, the first and second weeks in August.

They sit very closely concealed in the chinks of the bark, and are quite as difficult to see (if not more so) as a *Nepticula*; more especially as they do not run when they find themselves looked at, as *Nepticulae* do, but have the bad manners to drop, and generally outside the net. It seems surprising that so comparatively large a moth can make itself so nearly invisible. They sit very close during the day, except when stared at, to which they have a very decided objection, and must drop down among the herbage at dusk, as there are then none to be found, and I have taken none on the wing.—ID.

Captures of Lepidoptera at Howth.—I had my first trip across the Irish Channel this summer, to try to procure the larvæ of *Nepticula acetosæ*. I am happy to say that I was successful, thanks to "Shield's Practical Hints," the directions in which I found most exact and useful. The weather was not all one could desire for collecting, as they turned on the wet every afternoon I was there.

The mines are hard to find, and (especially when small) very difficult to distinguish from the ordinary spots and discolorations always present on the leaves everywhere. In fact, I searched closely the whole of the first day without finding one: they were certainly not numerous then, whatever they may be in the autumn. I fancy that when Shield speaks of their being in thousands, he must refer to the second brood, which is always much more abundant than the first. I was also so fortunate as to take five *Elachista flavicomella*; I believe that, with the exception of two taken near Glasgow by Mr. J. J. King, this species has not been taken since Mr. Shield met with it at Howth. It occurs later than I had expected it would, judging of it by *luticomella*, which had been out here for a month past at least. I got nothing else of importance; a few larvæ of *Depressaria rotundella* feeding on *Daucus carota*, and one *Eupæcilia pallidana*, were the only other captures worth recording. I specially devoted myself in the day time to the search for *Nepticula acetosæ*, by Dr. Mason's desire, and the heavy rain in the evenings prevented everything from flying.—ID.

[Mr. Sang had previously met with the larvæ of *Depressaria rotundella* on *Daucus carota* at Folkestone, in August, 1879 (see Ent. Mo. Mag., xvi, p. 112).—H. T. S.]

Scoparia conspicualis near *Burton*.—I had the pleasure of taking this latest addition to our *Scopariæ*, here, this summer, much to my surprise, as I did not dream of taking it so far south as this. The females are much more grey than the males, but all are, when in good condition, easily recognisable. I had the good fortune to get two or three small batches of eggs, which I sent to Mr. Buckler. No doubt they feed on the commonest mosses, as do all the *Scopariæ* with whose larvæ I have any acquaintance. I hope they may be successfully reared. I see the theory advanced that it is double brooded: one can hardly imagine such a thing in that genus. There may be a long succession of appearances, as one finds in *ambigualis*. Mine were taken in the beginning of August, and many of them were as fine as if freshly bred.—ID.

Additional Synonyms of Endotricha pyrosalis, Gn.—When examining lately the British Museum Collection, I saw the type of Mr. Butler's so-called *Rhodaria robina*; it is an ordinary male of this species, as I had supposed. Moreover, on carrying my investigations back into what were supposed to be *Deltoides*, I discovered three additional synonyms of the same species, considered by Walker as the types of three new genera; these are *Paconia albifimbrialis*, Walk., *Tricomia auroralis*, Walk., and *Messatis sabirusalis*, Walk. I examined the *Geometrina* without finding further examples.—E. MEYRICK, Ramsbury, Wilts: Nov. 9th, 1883.

Tortrix Lafauriana.—In a box of insects recently submitted to Mr. Barrett I am pleased to find a specimen of this new *Tortrix*. I took it last August about two miles from the locality where Mr. Atmore states he first discovered it.—ALFRED BALDING, Wisbech: October 19th, 1883.

Philonthus astutus, Er.—A short time ago, M. Fauvel kindly sent me a specimen of this insect, which he had found in the collection of M. Javet, ticketed "Ireland." As M. Javet collected for some time in Ireland, especially in the neighbourhood of Belfast, and as the insect is by no means an unlikely one to occur in the locality, M. Fauvel thinks that the specimen is probably British. M. Javet may possibly have made a mistake, and more evidence will, perhaps, be required before it is inserted in the British list, but the fact is worth recording, as Irish collectors may possibly confirm the capture.

P. astutus belongs to the group with six punctures on the thorax: it is placed by Erichson close to *P. aterrimus* (*P. nigritulus* and *trossulus*); it has, however, a very different facies, being more than twice as large, with longer and less strongly punctured elytra; my specimen is about the size of *P. lepidus*, and has castaneous elytra; it is very distinct from any other British species.—W. W. FOWLER, Lincoln: November 7th, 1883.

Diglossa submarina, Fairm. (*sinuatocollis*, Rey).—Since writing the note on *Philonthus astutus*, I have again heard from M. Fauvel, who says that, on looking over M. Javet's species of *Diglossa*, he has found among them several specimens from Ireland, which were sent to M. Javet by Mr. Haliday; among these there is a specimen of *Diglossa submarina*, Fairm., an insect not hitherto recorded as British; the species is distinguished from *D. mersa*, by its broader elytra, and especially by having the abdomen dilated behind ("en massue"), with close and fine punctuation, the abdomen of *D. mersa* being parallel, with strong diffuse punctuation; the thorax of *D. submarina* is also always more constricted at the base than in *D. mersa*; the two species appear to inhabit almost the same localities, and M. Fauvel says that he has no doubt that it is distributed over all the coasts of Great Britain, and that it will be found in British collections mixed with *D. mersa*.—ID.: Nov. 17th, 1883.

Note on the development of Phryganea striata.—On several occasions at some deep ponds in this neighbourhood I have had the good fortune to witness the development of numbers of *Phryganea striata*. The pupæ appear to leave their cases and rise to the surface usually near the middle of the ponds. The insects are seen first as dark specks on the top of the water; gradually they rise higher and higher until almost wholly out of it, then somewhat abruptly they free themselves from the pupa-skin, and run with astounding rapidity to the side. Before leaving the water, however, a curious operation is performed: the insect rests a little while, and then slowly raises its wings until they meet in a vertical position over the back, not unlike that assumed by the wings of a butterfly in repose. This appears occasionally to be done twice; the insect then finally leaves the water and conceals itself in the herbage on the banks. To me it seems a curious fact that the wings of an insect should be raised immediately after emergence to a position they never again assume.—K. J. MORTON, Carlisle: November 12th, 1883.

[The position assumed is probably connected with the rush of air and blood into the tracheæ and vessels. Much the same position is assumed by recently-emerged moths when "drying themselves."—R. McL.]

ANAX LONGIPES.*

BY PROF. H. A. HAGEN.

Spending my summer vacation at Woodsholl, on the south-eastern coast of Massachusetts, opposite Martha's Vineyard Island, I saw on the top of a hill a number of *Papilio Asterias*, eagerly hunted by a large *Æschnide*, which I believed to be probably *Anax Junius*. Finally a *Papilio* was caught by the hunter, which directly settled on a shrub to devour its prey. Both were very soon in my net; and, to my surprise, I found a brick-red *Anax*, unknown to me; it had the *P. Asterias* still between its legs, but had cut off the head of it. Only the following day, August 27th, 1875, when I caught, with difficulty, another male, and finally a female, did I become aware that I had before me the long-sought-for *A. longipes*. The species was by no means rare, but very wild, in the woods, mostly swinging around the tops of the trees, and on the hill, disappearing with the slightest wind. I was, therefore, not able to get more specimens. Returning home, I found, to my surprise, another female, collected March 3rd, in Hannover, Florida, and a third female, caught in Florida, by Mr. R. Thaxter, together with a *P. Asterias*, beheaded just as in my observation. My friend Uhler wrote to me that he had also collected at the same time *A. longipes*, near Baltimore. Probably it is not well known that, just the south-eastern shore of Massachusetts and the islands Martha's Vineyard and Nantucket, all subjected to the influence of the gulf-stream, possess a number of insects not to be found in the intermediate country down to Florida or Georgia, as *Tramea abdominalis*, *Ascalaphus*, and others.

My notes about the colours of the living *A. longipes* are as follows:—Head pale green, eyes dark reddish-brown, ♂, bluish ♀; ♂, thorax green; legs as described in my Synopsis; abdominal segments 1 and 2 green; 1, with a basal brownish spot; 2, with transversal median stripe, a darker ante-apical spot, and two reddish-green spots (two blue ones on the female); abdomen brick-red, 3 to 5 with a brown, triangular, apical spot, less marked on 6; a triangular, basal, brown spot on 4 and 5: the following segments and appendages red: ♀, abdomen brown, segments 3 to 9 with two apical blue spots; 3 to 7 with two blue basal spots; 4 to 6 with two intermediate blue spots; appendages light brown.

I have several times written about *longipes*. In my description (Synopsis. N. A. Neur., p. 118), the word "surface" for the abdomen,

* cf. ante, p. 129.

and the "9 post cubitals" are *not* in my manuscript, but were probably additions by my friend Uhler. The described female type belonged to Mr. Escher Zollikofer, of Zürich, and is probably in the Museum of that city.

In Stett. ent. Z., 1863, p. 373, I stated that *A. longipes* is not figured in Abbott's MS. in the Brit. Mus., and in Proc. Bost. S. N. II., vol. xvi, p. 350, that it is equally wanting among the insects figured by Abbott, in Dr. Le Conte's possession. But Mr. Escher Zollikofer positively assured me that he received the specimen from Mr. Abbott himself, and, moreover, it was prepared as all others of Mr. Abbot's insects, with arsenical soap on the under-side of the body. A fuller description than in the Synopsis I have given in my notes (still before me) in Verh. Wien. z.-b. Ges., 1867, p. 5. The description of the male will be found in a forthcoming publication; its appendages are 6 mm. long. The two females from Florida are a trifle smaller than those from Massachusetts.

Concerning the specimen in the Dublin Museum, there must be an error in Mr. McLachlan's measurements: the hind-wing is said to be 51 mm. long, therefore, the expansion of the wings cannot be 125 mm. My Woodsholl specimens have expanse of wings, 110 mm., the Florida females 105 mm. The ante-cubitals vary from 20—19, 18—16 in the wings of the same specimen; the post-cubitals vary from 8—9 to 11.

Mr. McLachlan has some doubts about the identity of the Dublin specimen with *A. longipes*, because the membranule is entirely yellowish-cinereous, instead of black with white base. In my specimen the membranule is blackish-cinereous, and the extreme base is white, which colour does not reach the anal vein. Further, in my specimens, the colour of the neuration is black, the costa yellow, in the Dublin specimen the nervures are mostly pitchy-brown, and the network reddish. I have not seen the Dublin specimen, but I think, in a specimen more than 100 years old, which has, perhaps, been subjected to the influence of sunlight, such changes could well arrive, the more so if the specimen had been a freshly-transformed one. At least, after my experience with equally old specimens, I would not consider these differences as deciding ones. I have also compared a male of *A. Junius* with a male of *A. longipes*, and find the differences exactly as stated by McLachlan. If the genitalia of the 2nd segment should prove similar to those of *A. longipes* in the Dublin specimen, I should consider them identical.

[It is very satisfactory to hear of the re-discovery of this species. Dr. Hagen's remark concerning the expanse of wings of the "Dublin specimen" is critical, and to the point. As the specimen is no longer before me, I applied again to Mr. More for information, and the measurement he sends me (in inches and eighths) can be reduced to 105 mm., showing that "125 mm." was a typographical error. He says that the specimen shows no trace of having been treated with any preservative on the under-side of the body. The genitalia of the 2nd segment are quite concealed.

Dr. Hagen also sends me notes and sketches of the appendages of his *A. speratus*, from one of Drège's examples, in his collection. After having subjected the head to the action of boiling water, he thinks that the front and mouth parts may have been originally yellowish, excepting the labrum, middle part of labium, and the back of the head, which remain doubtful: the supposed tooth on the excised portion of the superior appendages of the ♂ could not be detached after having been subjected to boiling water, and hence cannot be considered an extraneous substance. In this case, there is sufficient distinctness from *A. Rutherfordi*, in which (as previously said) there is not the slightest trace of such a tooth.

The catalogue-name, "*A. validus*," represents my *A. Walsinghami*, as suspected. To me it appears that the publication of catalogue-names (without descriptions) should be avoided. They carry no weight, and the fact of their publication has frequently a deterrent effect upon workers, who would wish to respect such names *if possible*. The indication of a "new species," without specific name, seems to me better in those cases in which, from a faunistic, or other, point of view, it is desirable to indicate the existence of "new species" where they cannot be described. The "synonymy" of *Neuroptera* in nearly all families is loaded with catalogue-names. "Museum" and "Collection" names are open to the same objection, but in a milder form; they are comparatively harmless so long as they do not get into circulation; if the necessity exists for them, they are much better than the publication of names with "descriptions" that no one can understand.—R. McLACHLAN.]

Worker wasps in December.—On the 16th inst., several workers of *Vespa vulgaris* were observed by me busily engaged at the ivy-blossoms in the middle of the day at Osmington, near Weymouth. A fully-winged grasshopper (*Stenobothrus*) was seen a few days previously.—A. E. EATON, London: December 19th, 1883.

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

I propose to give some account of the experiences of an entomologist who has spent upwards of four years collecting in Central America (two years in Guatemala, and two in Colombia). In this first paper I will speak chiefly of the apparatus, &c., I found most useful after a long residence in these countries. I took out with me a lot of heavy and fancy butterfly-nets, heavy sweeping and water nets, drying cages, &c., more than half of which I soon found were almost useless to me in countries where everything has to be carried either on the backs of Indians, or upon horses, or mules, where there are few, if any, cart roads, or navigable rivers, and where every additional ounce weight of baggage is a consideration; and the less you have to carry, and the lighter it is, the easier you will be able to get about from place to place. I usually travelled on horse- or mule-back, with a native servant, and carried my collecting apparatus in the saddle bags, or on front of the saddles, in addition to a change of clothing, waterproof coat, blanket, &c.; sometimes, if on foot, owing to the bad condition of the road, or if I intended making a stay of a month or so at a place, I would take (in Guatemala) one or two *mozos*, or Indian carriers, or another horse for my baggage with me; but, as a rule, I managed to carry sufficient for trips of a few weeks on my two saddle-horses or mules. My usual plan was to stay a few days here and there, at various places on the road, till I came to what appeared a likely place, then I would remain longer, and, if necessary, send to my nearest head-quarters for more boxes, &c.; in this way I travelled over a large part of Guatemala, and of the northern part of the Colombian State of Panamá. In my saddle bags I could generally manage to pack away my nets, bottles, boxes, tins, &c., and a store box or two, made up into a parcel my servant carried in front of his saddle, enough, altogether, to last me a month or six weeks. If the entomologist wants to obtain all Orders of insects, as well as many other things, as I did, he will find, when out collecting, one net quite as much as he can conveniently carry, more especially if he carries a gun also; sometimes I tried to carry, in addition to a butterfly-net, a large umbrella sweeping-net for beetles, &c., useful enough, no doubt, to a Coleopterist in this country, but in a tropical forest I would rather be without it; very soon I put away the latter as useless, finding that I could manage much better with a large, balloon-shaped, jointed-cane, butterfly-net: a net of this kind will answer very well for all Orders

of insects, it can be turned over to beat on to, and, at the same time, you have a net ready to catch anything on the wing (large numbers of *Coleoptera* and *Hemiptera* are found on the wing in tropical forests); the same net will also serve to sweep lightly with.

For more than three years I constantly used a net of this kind, and preferred it to any other; by taking out plenty of spare muslin or gauze, a few pieces of the jointed cane, and a Y or two in case of breakages, this kind of net can be used for almost any work. In my expeditions, I usually took a native servant with me, who, after a time, turned out a very good collector; I gave him a small cane or wire-ring butterfly-net (had a sweeping- and a water-bag also to fit this same ring, so that I could change if required) to carry.

A small light net on a long stick is sometimes very useful in the dense forest, various species of butterflies (*Pierella*, *Hetera*, *Antirrhea*, *Callithea*, *Taygetis*, &c.) frequent the dense matted undergrowth, where it is impossible to strike at them with a large net; this net is very useful for taking *Cicadæ*, butterflies, &c., from the trunks, also for some high-flying *Castnia*, *Nymphalidæ*, &c., as a large net on a long stick is often unmanageable.

An ordinary umbrella (especially a white one) is very useful, not only for the rain or sun, but for beating purposes; in the early mornings of the rainy season, when the vegetation is still reeking with moisture, lots of *Carabidæ*, *Lampyridæ*, &c., occur by beating; later in the day, they are more active, and very often fly off instead of dropping into the umbrella.

For collecting purposes in the forest, I carried then, one or other of the above-mentioned nets, one or two largish corked zinc collecting boxes (damped before starting in the dry season, otherwise the insects will be stiff and dry long before you get home) for *Lepidoptera*, *Hymenoptera*, &c., a cyanide and plaster killing-bottle, a few bottles of various sizes, with a *little* piece of cyanide of potassium (tied up in paper or muslin), and plenty of crumpled paper inside (the paper to be changed daily, I preferred it to sawdust), for *Coleoptera* and *Hemiptera*, a few test tubes and small tin boxes, and, slung at my side, a tin box or vasculum, with a division or two inside for butterfly-papers (the papers, of course, folded and ready for use).

I, myself, seldom put many butterflies, excepting the very large species, in paper at the time of capture, unless my zinc collecting boxes were full; they carry much better till you get home, when you can put them away properly in papers—in the corked boxes, pinned through the side of the body, many species seldom die out-

right, either with a pinch of the fingers, or with the cyanide, they often come to life again, and if in papers damage themselves a good deal; large, thin-bodied species, however (*Heliconidæ*, *Morphidæ*, and most, but *not all* of the *Papilionidæ*), die readily enough, and may, like dragon-flies, be carried home in the papers; but *Hesperidæ*, *Castniæ*, and all thick-bodied species, are very much better carried in the field in the corked boxes, and put into paper on arrival at head quarters.

All *Hymenoptera*, *Diptera*, stout-bodied moths, many *Orthoptera*, the larger *Homoptera*, &c., I killed with the cyandide and plaster bottle, and pinned immediately after capture. I mounted on card, and pinned, if possible, before sending to England, types of all my *Coleoptera* and *Hemiptera*, packing the remainder away in pine sawdust, with a little spirit and carbolic acid; green *Orthoptera*, *Capsidæ*, many *Homoptera*, and many of the pubescent longicorns, do not improve in sawdust; they should be pinned, if possible, or, failing room, they can be sent dry, in papers, like the butterflies, thin-bodied moths, *Neuroptera*, &c.

In the long (seven or eight months) rainy season, it is only with the greatest difficulty possible to keep one's collections from going mouldy; a drying cage is of little use, unless you have a tin case to put it into immediately the afternoon rain commences, and can so suspend it as to keep out ants, small undeveloped *Blattæ*, &c. (I must say I could seldom manage to successfully keep out these pests myself); store boxes corked on one side only, and not fitting too closely are, perhaps, better than tight fitting ones (have nothing to do with varnished or painted boxes), and tin boxes for insect papers, and wide-mouthed bottles or tins for insects in sawdust; plenty of creosote, naphthaline, camphor, or similar substance, must be used for ants, &c, otherwise, you will speedily lose your captures. While mounting beetles, &c., indoors, the ants have often carried off my captures absolutely under my very nose; in the "tierra caliente," or hot country, you can scarcely put a box down on the table for these pests, even for a few minutes; often I have come in wet or tired from an entomological expedition, and put my collecting boxes down for a short time while changing my clothes, &c., only to find on opening them shortly afterwards that hundreds of ants had already commenced devouring my captures. I generally used store-boxes for drying all my pinned insects (the drying cage not answering satisfactorily), getting them out in the sun, of course not letting the direct rays fall on the insects, for a short time in the mornings during the rainy season. Carbolic

acid is of great use in preserving. I found it a good plan to just touch with it all large insects I wished to pin; decomposition seems to set in almost immediately after death in these hot damp climates: often I have pinned longicorns, &c., and, a day or two after, found the contents of the body turned to water, and the legs and antennæ dropping out entire from their sockets; by touching, however, in time with carbolic acid, this can be prevented. Large *Orthoptera*, *Fulgoridæ*, *Cicadæ*, the large *Libellulidæ*, and even some *Sphingidæ*, had better have the contents of the abdomen taken out and re-placed with rolled blotting paper. Blow-flies are often very troublesome, they are especially fond of *Orthoptera*; many times, on drying my boxes in the sun, I have found Dipterous larvæ or pupæ dropping out of the bodies of these and other insects. A large number of delicate fragile *Capsidæ* and other insects, mounted fresh on card, arrived in this country in first-rate condition. I had the greatest difficulty, I think, in keeping the *Trichoptera* and the smaller *Lepidoptera*; they would mould, and, if dried too often, their wings shrivel a good deal. Soft, thick-bodied moths, such as the *Zygænidæ* and allies, do not come well in papers, they are better pinned, as, indeed, are most moths. The *Castniæ* are most difficult to obtain in good condition (the *Hesperidæ* are bad enough), difficult to catch, and difficult to kill, and their loosely attached scales come off at the slightest touch.

Nearly everything can be killed with cyanide, some large moths, however, require pricking with a pen dipped in oxalic acid in solution, or some other poison; yellow *Hymenoptera* must not be left long in cyanide, or they will change colour: the yellow turning to red. Natives often brought me large *Passalidæ*, Longicorns, *Buprestidæ*, &c., tied round the junction of the thorax and abdomen with a thin piece of "bejuco," or vine from the forest, and moths, &c., impaled upon thorns, the latter plan I do not recommend, the former I often adopted out collecting, when my boxes were full. Travelling so much, I was able to do but little in the way of breeding *Lepidoptera*, it is not easy to carry many living larvæ about with you on horseback, but, doubtless, a great deal could be done by any one stationary; even with larvæ, the ants troubled me a good deal; as soon as one died, they would swarm in my breeding box. I obtained large numbers of insects at light, but sugar, on the few occasions I tried it, turned out a failure.

To conclude, I may say that, during my residence in Central America, I probably obtained not less than 15,000 species of insects (besides other things), the greater part of which I hope to see eventually catalogued or described in Messrs. Godman and Salvin's splendid work on the Zoology of that country.

(To be continued).

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DESCRIPTION OF THE LARVA OF *APAMEA FIBROSA*.

BY WILLIAM BUCKLER.

After fruitless researches at various times during a quarter of a century by many skilful collectors, desirous to find the larva of this species,—reputed to be abundant in fens and similar places—my hope of obtaining it had almost died out, but revived towards the end of last year with encouragement from Mr. W. H. B. Fletcher, when he made known to me that very strenuous efforts had been devoted to it, and would be continued until the mystery of its habitat was cleared up.

The success that crowns perseverance has in this case been happily exemplified by Mr. Albert Houghton, of Wicken, who deserves great credit for his praiseworthy efforts in bringing this larva to light, after it had so completely baffled all who had before searched for it in this country.

Without calling in question the accuracy of Treitschke, who assigned to *fibrosa* the flower stems of *Iris pseudacorus*, I yet may venture to say there seems to me but little doubt that this conclusion may have been drawn probably from an aberrant example, as latterly in England there had come to be a consensus of opinion that it could not be found in those stems.

But, however that may have been, it is now certain that I had the great pleasure to receive this larva from Mr. Fletcher on the 1st of July, 1883, being one of several Mr. Houghton had a day or two before sent to him, and these were supplemented with further examples, and on the 21st, Mr. Fletcher most kindly presented me with one of the pupæ which had resulted from them.

Of course, I tended the larva most assiduously with fresh, but substitute food, from the most likely aquatic plants I could find, including at first *Sparganium*, *Iris*, and *Carex*, giving it the lower parts of each next the root; but it persistently refused the first two named, and ate only of *Carex paludosa*, and very sparingly of that as though not quite to its taste; yet seeing it eat, I was hopeful the first three or four days of rearing it, but was soon undeceived, as just within a week it died of atrophy, after vainly wandering about in quest of its proper food plant, the great fen sedge, *Cladium mariscus*.

Mr. Houghton was led to his discovery of the larva by observing that when the crop of this sedge had been cut and removed there were some of these plants that had not pushed out fresh shoots, and looked as though dead in the middle; these on being closely examined proved

to be tenanted by the larvæ, whose ravages had thus betrayed themselves to him, and from the experience subsequently gained, he arrived at the conclusion that each larva had ravaged about nine or ten shoots of *Cladium* before it was fed up.

When the *Cladium* is mown, the situation of the larva is found to average a distance of about an inch and three-quarters below the cut surface, where the leaves are grown so compactly together as to form almost a solid substance, and *there*, a little above the root-stock on the outside, is a roundish hole, pierced horizontally or tortuously to the very heart or centre of the plant, from whence this excavation is enlarged and extended either upwards or downwards or a little in both directions, just as the larva chooses to feed; and the hollow residence thus eaten out is thereby more or less irregular in form and direction, though generally an inch and a half in perpendicular length and from a quarter to three-eighths in width, as from a sample comprising a good number of these excavations, most kindly sent by Mr. Fletcher for my inspection, I found all varying a little from each other, though in one important particular they were alike, in the fact of their being just sufficiently low down to escape the scythe of the mower.

On the 14th of August I bred the moth, a female. The length of the larva I figured was from 13 to 14 lines, it was of moderate thickness and very cylindrical throughout, except that the head was a trifle smaller than the second segment and the third and fourth rather the stoutest, the thirteenth with a very remarkable sloping plate on the anal flap *flattened in the middle and having a prominent ridge round the margin* with large tubercular warts at the hinder edge; the segmental divisions plainly defined, and also the sub-dividing wrinkles across the back of each beyond the fourth, viz., one not far from the beginning, another well behind the first pair of tubercular warts, and a third a little behind the second pair of the trapezoid, and all the legs very well developed; in colour the head was of a dark warm brown, darkest at the mouth and very glossy, a black glossy plate on the second segment, the anal plate blackish-brown with black marginal ridge and posterior warts; the rest of the body above was of a very dark slaty-brown, rather inclining to a very deep olivaceous-drab, especially on the thoracic segments; and the belly and legs a lighter drab, the faintly paler dorsal and sub-dorsal lines of drab just distinct enough to be seen; the tubercular warts black-brown, each with a fine hair, and in relative sizes and situation arranged precisely the same as

in *H. micacea*; the spiracles oval and black, the ventral and anal legs barred with black, the feet fringed with dark-brown hooks that clung to any surface they touched; the skin, generally soft and smooth, glistened slightly at the wrinkles while the larva was crawling.

The cocoon was about an inch long and half an inch wide, of elliptical figure, composed of earthy particles mixed with moss and other vegetable comminuted matter, the inside smoothly lined with brownish silk. The pupa was 9 lines in length, of stout and robust character, the eye-pieces rather prominent, and beneath them the head produced to an obtuse point; the thorax thick, with a swollen rounded form, the wing-covers and all other parts clearly defined and smoothly wrapped close to the body; the lower abdominal rings tapered gently to the tip which ended with two fine points; in colour the head, thorax, and wing-covers were of a very deep olive-green, the abdomen of a less deep and brownish olive-green, the divisions of the movable rings darker, the surface shining; the two anal points had become entangled in silk threads that held the old larval skin, and this skin still retained the very remarkable anal plate, already described, in such perfect condition as to afford the most satisfactory identification.

Emsworth : December 3rd, 1883.

CONFIRMATION OF THE MIGRATION OF *APHIDES*.

BY JULES LICHTENSTEIN.

In the October (1883) No. of the Ent. Mo. Mag. my good friend G. B. Buckton, of Haslemere, replying to my criticism of his "*British Aphides*," says:—"The subject of migration of *Aphides* is of considerable interest from a scientific, as well as from an economic, point of view, and the production of well-ascertained facts will at once assert their value, and eventually hold its own against all comers."

I hope to be able to-day to convince the readers of the Ent. Mo. Mag., by affording undoubted evidence as to the fact of migration of the elm plant-lice.

Prof. Horváth, of Budapest, discovered in the last months of 1882 that a root-feeding Aphid, which he had determined as *Pemphigus zeæ-mâidis*, Löw and L. Duf. (= *Boyeri*, Passerini, = *radicum*, Fonscol.), after becoming winged, flew from the maize roots to the trunks of elm-trees, and there deposited its sexed progeniture.

I tried, on receiving the notice of my learned friend of Budapest, to make the contrary proofs, and to bring the winged spring-forms of all elm-feeding plant-lice on to maize-roots. Contrary to my expectation, the only *Pemphigus* known on elm (*P. pallidus*, Haliday, *sub Eriosoma*) died without touching the roots; while, on the contrary, another elm-louse, viz., *Tetraneura ulmi*, immediately fixed itself, sucking at the roots, and improving in size.

Greatly puzzled by the fact, I wrote to my friend in Hungary:—"Please send me what you call *Pemphigus zeæ-mäidis*." He did so at once, and I immediately recognised by the neuration of the underwings, and the relative length of the antennal joints, that the insect was not a *Pemphigus*, but the very same *Tetraneura ulmi*, Auct.

I consulted the authorities on Aphidology, M. Passerini of Parma, Kessler of Cassel, Löw of Vienna, and Ferrari of Genoa, asking for specimens of their *Pemphigus zeæ-mäidis* or *Boyeri*, and sending Horváth's examples for comparison: the result of my enquiries was that both insects are the very same thing, and that Hartig's character of the neuration of the underwings in the genus *Tetraneura* cannot be absolutely relied on, as there is sometimes a second very feeble nervure in some examples, but that the character easy to seize, viz., the 5th antennal joint being equal to the 3rd, sufficiently distinguishes *Tetraneura ulmi* from all other elm-lice.

Meanwhile, as maize is not commonly cultivated in our district, whereas *Tetr. ulmi* is exceedingly abundant, I searched at the roots of various grasses, and found that those of *Cynodon dactylon* were also attacked by the same underground lice. In October, they changed to nymphs, and to winged forms. I had a certain number in glass tubes, where they soon deposited their sexed *proles* without rostrum, and I witnessed the pairing, after which the female dies, conserving her unique egg in the dried skin. I had already discovered the female in 1878 (*vide Ent. Mo. Mag.*, vol. xiv, p. 224). But, in addition to this, I made experiments at large at my cottage at La Lironde, and, as the trunks of my young elms seemed to me too smooth to offer a good shelter to my pupiferous *pseudogynæ*, I tied round them a band of paper, and placed on it some winged-lice collected at the grass-roots. They did not fly away, but, on the contrary, finding probably the place to their taste, they passed between the paper and bark, and began to lay their sexed young ones.

But what is still more astonishing, they served as an attraction for other lice from the surrounding fields, where *Cynodon dactylon* grew, and already, on the following day, my paper band was crowded

with *pseudogynæ* and *pupiferae*, bringing their male and female pupæ, which burst open in a very short time, giving issue to the "perfect" form, which is very imperfect indeed in these creatures, as they show only the organs of generation and nothing else.

Now the last step must be narrated, the last proof must be afforded. Out of the eggs concealed in the dried skin of the mother I must obtain the *pseudogyna fundatrix*, and see her form her gall on the young elm-leaf. This proceeding has already been so well observed and described by Prof. Kessler, that, besides the fact of seeing the *fundatrix* of the gall coming out of the egg proceeding from the grass-root lice, I will have only to follow and confirm his observations.

At the same time that I discovered *Tetr. ulmi* on *Cynodon* roots, I could also establish more surely the kind of grass on which the second species of *Tetraneura* of the elm feeds, which I named *Tetraneura rubra*, because the gall is red.

I had written to Mr. Buckton and others that it was *Triticum caninum*, but this spring I had the species of grass more certainly determined by Prof. Planchon: it was *Panicum sanguinale*. The young lice of *Tetr. rubra* are reddish, while those of *Tetr. ulmi* are white, and in the winged *pupiferae* the 5th antennal joint is shorter than the 3rd, while they are equal in *Tetr. ulmi*.

So I can affirm that *Tetr. ulmi* passes the summer as an underground plant-louse on grass-roots (maize or *Cynodon**), and *Tetr. rubra* on *Panicum sanguinale*.

The three other gall-lice of the elm, viz., *Pemphigus pallidus*, Haliday, *Schizoneura lanuginosa*, Hartig, and *Schizoneura ulmi*, Kalt., also assume their winged pupiferous form on the elm-trunks, but I cannot yet discover where they come from. I fancy that Buckton's *Schiz. fodiens*, feeding on black-currant roots, might be the underground form of *Schiz. ulmi*; at any rate, the antennæ are entirely similar, according to Buckton's figures, but, of course, this is only a supposition, and more evident proof requires to be given.

Montpellier: 3rd December, 1883.

* In quoting two species of grasses on which I found the under-ground form of *T. ulmi*, I do not wish to assert that it may not occur on other grasses. On the contrary, for Passerini has found it also on several species of *Sorghum*, *Panicum crus-galli*, *Oryza montana*, *Eragrostis megastachys*, *Lolium perenne*, *Coix lachryma*, &c., so it is very likely that, in England, the insect resorts to species of grasses more common there than are maize or *Cynodon*. Mr. Buckton says he has found the species plentifully at the roots of *Hieracium murorum*, *H. sabaudum*, and *Lactuca*, but I think there is some error, for the antennæ (Brit. Aph., ii, pl. ex, fig. 3), do not at all resemble those of Löw's *P. zea-maidis*, in which the 5th joint is equal to the 3rd, and I think Mr. Buckton's insect will some day prove to be the under-ground form of some poplar gall-louse, perhaps *P. bursarius* or *pyriformis*, but, of course, proof is necessary to sustain my hypothesis. *Tetraneura rubra* has not yet been found in England, and this is, perhaps, owing to the scarcity there of *Panicum sanguinale*.—J. L.

ACANTHACLISIS OCCITANICA AND *A. BÆTICA*; A DIFFERENTIAL
ESSAY.

BY ROBERT McLACHLAN, F.R.S., &c.

The comparative ease with which closely-allied species may be distinguished is not always in direct proportion to the size of the animals. This axiom is strikingly exemplified in the large Ant-Lions for which Rambur (in 1842) proposed the generic term *Acanthaclisis*.* Down to 1842 only one European species (*occitanica*, Villers, with synonyms) had been described. Rambur added a second European species (*bætica*). It was very recently that I found myself able, from the materials in my collection, to differentiate two European species, which could not be other than *occitanica* and *bætica*, but concerning which Rambur's descriptions left me uncertain, especially on one very important point (alluded to in the remarks that follow). The difficulty was increased because I possessed only the ♀ of one of the species. I therefore applied to my ever-obliging friend, Baron de Selys-Longchamps, who at once forwarded, for examination, the ♂ type of *A. bætica*, Rambur, in his possession. This cleared up the doubts occasioned by an unlucky expression used by Rambur, and has enabled me to put together the following notes, the result of former vain and now successful attempts, on my part, to come to any definitive conclusion as to the distinctive characters of the two species.

A. OCCITANICA.

General form more robust and average size greater.

Last joint of labial palpi shorter, *more suddenly clavate*, with the apex rather suddenly slenderer.

Median longitudinal band on the pronotum furcate anteriorly (complete posteriorly).

Anterior wings having a *short blackish basal line* between the two cubiti; the two rows of pentagonal cellules in the costal area *strikingly unequal in size, the upper being much shallower than the lower*.

A. BÆTICA.

General form more slender and average size smaller.

Last joint of labial palpi longer, *more gradually clavate, the club more slender*, and not suddenly narrowed at its apex.

Median longitudinal band on the pronotum separated into two lines for its whole length by a central (sometimes interrupted) line of the ground colour.

Anterior wings with *no blackish basal line*; the two rows of pentagonal cellules in the costal area *nearly equal in size*.

* Since Rambur's time, discordant species, probably forming several generic groups, have been located in *Acanthaclisis*, many of which contradict the character upon which the generic term was based

Posterior wings: the transverse basal nervules between the radius and the upper cubitus *suddenly thickened and geniculate* at their upper end.

Appendages of ♂ *long*, flexuous, reddish, *with a strong inner tubercle before the apex*, bearing strong black spinose hairs (or this tubercle may be considered the actual apex, from beneath which proceeds a straight cylindrical process).

Posterior wings: the transverse basal nervules between the radius and the upper cubitus sometimes slightly thickened, but *not geniculate* at their upper end.

Appendages of ♂ *short*, curved, yellow, obtuse, *with no inner tubercle* (or with no apical process, according to what appears to be the real nature of the appendages in *occitanica*).

Thus the most decisive characters whereby to separate the two species lie in the form of the apical joint of the labial palpi, *the presence or absence of a short blackish basal line in the anterior wings, the comparative sizes of the two rows of pentagonal cellules in the costal area in these wings, and in the form of the anal appendages in the ♂*.

Rambur's descriptions of the two are mostly excellent; but there is one expression so vague, and so apparently contradictory, that it quite misled me. In describing *A. occitanica*, he says simply, "espace costal ayant deux rangées d'aréoles;" in describing *bætica* he says, "espace costal contenant deux rangées d'aréoles, dont une plus large que chez l'*occitanica*." The latter expression would leave it to be inferred that the two rows were *unequal* in *bætica*, and *equal* in *occitanica*, whereas the contrary is the case, and the only way of reading it so as to bear even a semblance of truth, is that *one* row in *bætica* is broader (or larger) than the *corresponding* row in *occitanica*; and I suppose that is what he really intended.

The presence or absence in the anterior wings of the short black or blackish basal line* between the two cubiti ("la 4^{me} et 5^{me} nervures" of Rambur) is an excellent *prima facie* character, not alluded to by previous authors.

Hagen, Stett. Zeit., 1866, p. 288, calls attention to a slight character in the neururation (it should have been stated only of the *posterior* wings), viz., that immediately under the radius ("mediana") there exists, in *bætica*, a rudimentary longitudinal nervure in which the transverse nervules end (instead of directly in the radius); it certainly exists in most specimens of *bætica* examined by me, but it equally exists in some undoubted specimens of *occitanica*; the *geniculation* of the end of these nervules appears to be constant in *occitanica* and absent in *bætica*.

* Hagen, Stett. Zeit., 1858, p. 125, alludes to an example of *occitanica* with a black streak under the sector of the radius up to the pterostigma.

The form of the anal appendages of the ♂ is very different in the two species. If my ideas are morphologically correct, the inner tubercle ("portion interne saillante" of Rambur) in the appendages of *occitanica* really represents their true apex, the process below it being supplementary (and absent in *bætica*). There is also a ventral process (or inferior appendage) which is longer in *bætica* than in *occitanica*.

Locality is no guide. *A. occitanica* occurs certainly in all the Mediterranean districts of Europe (introduced in Prussia), South Russia, and in Central Asia. (A ♂ and ♀ from Bone in Algeria, in in De Selys' collection, have a slightly different *facies* in wing-markings, but are not structurally distinct). *A. bætica* occurs in Spain, at Montpellier (coll. McLach.), in Turkey (Besika Bay, coll. McLach.), and in Syria (*teste* Hagen).

With a view to test the bibliography, I have consulted most of the older authors, and in my opinion they all had *A. occitanica* under consideration. I will here briefly refer to those authors who have given figures:

De Villers (Linn. Ent., iii, p. 63, pl. vii, fig. 10, 1789), originally described the species as *Myrmeleon occitanicum* (from Nîmes in the south of France); his figure is *excellent*, and shows distinctly the inequality in the two rows of costal areoles.

Rossi (Faun. Etrusca, ii, p. 14, pl. ix, fig. 8, 1790), under the name *M. libelluloides pisanus*, gives a wretched figure, but no doubt intended to represent *occitanica*. In his description he shows that the form of the tibial spurs had not escaped his notice.

Olivier's figure (*M. occitanicum*, Encyc. Méthod., viii, p. 122, pl. xcvii, fig. 6) is only a bad copy of Rossi's.

Panzer's figure of *M. pisanum* (Faun. Germ., fasc. 59, pl. iv) was undoubtedly meant for *occitanica* (♂), but it is indifferent, and he contrived to represent the principal nervures as *double*.

Fischer von Waldheim (Ent. Russ., iv, p. 43, pl. i, fig. 1, *circa* 1846) describes and figures *A. occitanica* as *Myrmeleon georgianum*; his figure is tolerable. In his description he uses the vague term "costæ duæ præcipuæ duplicatæ" (*cf.* also Hagen, Stett. Zeit., 1858, p. 125), by which I think he intended to allude to the double row of costal areoles. At any rate, I cannot otherwise account for the expression, and he was not influenced by Panzer's figure.

A. Costa (Faun. Napoli, Neurotteri, Myrmeleontidea, p. 7, pl. viii, fig. 2) gives a good description as *Acanthaclisis occitanica*, and his

figure (♂) well shows the inequality in the two rows of costal areoles, but the markings of the thorax and wings are very indifferently indicated.

Finally as to figures: that by Savigny (Descript. de l'Égypte, Neuropt., pl. iii) indicates a ♀ *Acanthaclisis* that should be *occitanica* according to the costal areoles and the labial palpi, but the markings on the pronotum very badly represent those in that species. Therefore I consider there is just a little doubt as to the species intended, a doubt that would not exist had Savigny been a less faithful follower of Nature in his usually admirable figures.

Some minor points (chiefly alluded to by Rambur) have not been here considered in my endeavours to elucidate the chief distinctive characters of *A. occitanica* and *A. bætica*; a difference in the form of the tibial spurs is the most important.

Hagen (Stett. Zeit., 1866, p. 289) alludes to an *Acanthaclisis* from Japan (*A. japonica*, Hag., McLach., Tr. Ent. Soc. Lond., 1875, p. 174) as perhaps only a variety of *A. bætica*. Undoubtedly it is nearer *bætica* than *occitanica* in the costal areoles, appendages of ♂, &c., but the markings of the pronotum, &c., are sufficiently distinct, and, if I mistake not, the labial palpi more nearly approach those of *occitanica* in form. My materials for this species are not sufficient, nor in absolutely good condition.

Lewisham, London:

December, 1883.

Concerning Tomateres pardalis, F., and T. clavicornis, Latr., two very closely allied species of exotic Myrmeleonidæ.—In 1781, Fabricius described (Spec. Insect., i, p. 398) a pretty ant-lion from “Coromandel,” under the name of *Myrmeleon pardalis*, in Banks’ collection (the original type exists, and is in the British Museum); this species was subsequently described by Walker in 1853, as *M. compositus*. In 1830, Latreille figured (Cuvier’s Règne Animal, iii, p. 438, pl. xix, fig. 4), a species from Senegal as the “Fourmillon clavicorne.” In 1866, Hagen formed for these (and some others) the genus *Tomateres*, on account of the form of the club of the antennæ.

The Indian *T. pardalis* was tolerably common in collections, but the Senegal *T. clavicornis* remained almost unknown, and even Rambur (1842) could only give a description after the original notes and figure; the relationship with *T. pardalis* was evidently very close. A few years ago numerous examples of a *Tomateres* (excessively like *pardalis*) arrived in this country from Abyssinia; on account of the rather wide difference in locality, I hesitated to consider them identical with *clavicornis*, and regarded them rather as a slight variety of *pardalis*. By a lucky chance, I found, two years ago, in one of M. E. Deyrolle’s boxes at Paris, an un-

doubted *clavicornis* from *Senegal*, and, moreover, found the Abyssinian examples were identical therewith, and, further, that the Indian *pardalis* only differed in certain small points.

The chief character whereby to separate the two is in the colour of the legs. In *pardalis* the tibiæ and tarsi are wholly black (except the base of the tibiæ); in *clavicornis* the tibiæ and tarsi are wholly yellow, or reddish-yellow (the tarsi with black spines). There are some other minor points:—in *pardalis* the three black spots on the pronotum are usually (but not invariably) connected into a transverse line; in *clavicornis* they appear to be always widely separated; in *pardalis* the transverse black streaks on the anterior-wings are less numerous; and in *clavicornis* the colour of the body is paler yellow.

I believe the two may be considered distinct, but it is an interesting point in geographical distribution to find so marked a form existing with only slight modifications from *Senegal* to *India*, and also to find that the Abyssinian individuals do not differ from those from *Senegal*.

T. clavicornis may be regarded as a resuscitated species, so long had it remained known only by the original indications.—ID.: *December 1st*, 1883.

Formicaleo tetragrammicus, *F.*, as a *Swiss insect*.—According to a remark in Meyer-Dür's "*Neuroptern-Fauna der Schweiz*" (1875), there exists some doubt as to this Ant-Lion having been observed in *Switzerland*. I am of opinion that it has hitherto been confused there with *Myrmeleon europæus* (*formicarius*, auct.) Dr. Jordan has just sent me an example of *F. tetragrammicus* that he caught a few years ago near *Sierre* in the *Valais*, and I have two specimens labelled "*Zermatt*."

I take this opportunity of stating that the "*Ascalaphus macaronius*, Scop.," of Meyer-Dür, is *A. longicornis*, L. The two *Swiss* species are *coccajus*, W. V., and *longicornis*, L. The true *A. macaronius* does not occur so far west in *Europe* as *Switzerland*.—ID.: *October 30th*, 1883.

Four species of Chrysopa unrecorded for Switzerland.—I find in my collection the following species, all taken by myself, that do not appear in Meyer-Dür's "*Neuroptern-Fauna*:"—*Ch. dorsalis*, *Burm.*, a single example beaten from *Pinus sylvestris* in the *Val d'Anniviers* (*Valais*), 9th July, 1882. *Ch. nigricostata*, *Brauer*, *Forêt de Pfyn* and *Vispthal* (both in the *Valais*), 10th and 11th July, 1882. *Ch. viridana*, *Schneider*, one example on the *Alpbach* above *Meiringen*, in July, 1878; ordinarily a meridional species. *Ch. flava*, *Scop.*, *Meiringen*, July, 1878. In vol. xvii, p. 141, I recorded *Ch. pallida* from *Thusis*; in 1882 I saw this species in the late *Ed. Pictet's* collection at *Geneva*, with the label "*Burgdorf*," in Meyer-Dür's hand, so it must have been overlooked by that author when compiling his "*Fauna*."

Other unrecorded species of *Swiss Planipennia* (notably curious forms of *Coniopterygidae*) are in my collection, but not yet sufficiently worked out.—ID.: *December 1st*, 1883.

Destruction by White Ants at Calcutta.—On a "slip" inserted into Part ii of Vol. li of the "*Journal of the Asiatic Society of Bengal*" (published August 21st, 1882), is printed the following notice:—

"The greater portion of the impression of Plate xvi having been destroyed by white ants, members and correspondents are requested to abstain from binding Vol. i, Part ii, 1881, until they have received a copy of it."

This is both interesting and serious, as showing the danger to which scientific and literary work is exposed in India; and it is curious from a purely literary point of view.—ID.: *December 8th*, 1883.

Capture of Phaneroptera falcata, Scop., in England.—In September, 1881, while walking along the cliffs near the little fishing village of Porthgwarra, in the Land's End district, I captured a single specimen of *Phaneroptera falcata*, Scop., at rest on the grass near the foot path.

This very conspicuous and beautiful Orthopteron belongs to the *Gryllidæ* of Stephens, = *Locustina* of Burmeister and Fischer, and has not hitherto been recorded as captured in England. According to Fischer, it occurs in S. Russia, S. Germany, Switzerland, S. France, and Egypt, and there are specimens in the British Museum from Madeira.

It is possible that it may be an imported specimen, if so, the nearest port through which it could be introduced is Penzance, which is distant about ten miles, as the crow flies. The Porthgwarra boats are small, and used for fishing near the coast in fine weather, in fact, their only access to the sea is through a tunnel excavated through the rock; on the other hand it is also possible, considering the Lusitanian character of the Flora of South-West Cornwall, that it may be an indigenous species, and it is to be hoped that any entomologist meeting with any species of this family either in Cornwall or the South-West of Ireland will preserve it for examination.—PHILIP B. MASON, Burton-on-Trent: *December*, 1883.

[If this fine and not specially destructive insect can be included in the very limited list of British *Orthoptera*, it will be a grand addition. Personally, I incline to the opinion that the specimen captured by Dr. Mason *may* have been imported by some vessel bound up-channel from the Mediterranean. Many years ago, I had given to me a living specimen of *Locusta viridissima* found on board a ship in mid-channel. As that ship was homeward-bound from the east (*viâ* the Cape), the natural inference was that the insect had flown on board in the channel, either from the French or English side. In Brunner von Wattenwyl's "Prodromus der europäischen Orthopteren" (1882), a very worthy expansion of Fischer's Monograph of 1853, and describing about double the number of European species given in Fischer, the northern distribution of *Ph. falcata* is stated as 48° in Europe proper.—R. McLACHLAN.]

Some further remarks on Nepticulæ.—Soon after the publication of my last notice concerning the pupation of *Nepticulæ*, in the Ent. Mo. Mag. for June, 1883 (pp. 17, 18), I was surprised to see freshly spun cocoons of *Nep. sericopeza*, both on the new, half-developed keys, and on the young, fresh leaves of a maple tree. These cocoons were all at, or near, the extremity of the lower boughs of a tree which grew on a hedge-bank, the lower branches of which spread far across a considerable ditch, and then over the pathway alongside of it. Now, whether these larvæ had wintered in

the ground, or on the trunk, they must, in either case, before spinning their final cocoons, have travelled a considerable distance, at a time when, considering their long winter sleep and fast, they might well be expected to be somewhat enfeebled.

Mons. Goureau records the finding of cocoons in the autumn on the keys, *just outside* the hole from which the larva had emerged. In this place I have never found them, but may it not well be the case, that the larvæ do so spin, close to the point where the key rests on the petiole, or even on the petiole itself? These do not generally fall with the keys, but remain on the tree till the appearance of new leaves in spring: in many cases also the keys themselves do not fall. Thus it would be only a short ramble for the resuscitated larvæ on to the young keys and leaves. One thing at all events is certain that the larvæ which had spun these fresh cocoons in the last week of May, had not fed up in this year's keys, which were even then in some cases not half their full size, while many still bore the parts of the flower. The imagos bred were all true *sericopeza*, in nowise differing either in size or colouring from the later brood.

In the month of July, while examining the leaves of *Salix alba*, I noticed at the extreme tip of a leaf, a brown *Nepticula* cocoon, and lower down, in the same leaf, the empty mine. On further search I discovered 20 or 30 such cocoons, all but one in the same place, at the tip of the leaf, not always the same leaf as that in which the larva had fed up, but occasionally in an adjacent one. The sole exception had spun up on a midrib, close to the leaf-stalk. Among the imagos which emerged and which appear to be true *salicis*, there was one very beautiful variety with the fore wing white from the base to the external margin of the pale fascia.

While on this subject of the *Nepticulæ*, I may call attention to two facts in connection with the autumn brood of the present year:—first, the excessive mortality among nearly all the species: secondly, the unusual scarcity of many larvæ generally plentiful, and the unusual abundance of others.

Thus *atricapitella* and *ruficapitella* of the oak-feeders, *viscerella* and *marginicolella* of the elm-feeders, and *gratiosella* and *ignobilella* of the hawthorn, the mines of which are all generally more or less common, have this autumn been quite scarce. On the other hand, *basiguttella* and *subbimaculella* have occurred in far greater numbers than I have ever met with them before, the latter, always abundant, being this year in thousands. The other commoner species, such as *oxyacanthella*, *atricollis*, *anomalella*, *trimaculella*, *catharticella*, with those of the birch and alder, have appeared pretty much as usual. But nearly all alike have been extraordinarily subject to disease at every period of their larval life. This disease would seem to commence with a discolouration of the dorsal vessel alone, the larva ceases to feed, and dies *in situ*, after which the whole body becomes dark. After examining a large number I am satisfied that this mortality was not attributable to the attacks of ichneumons; possibly owing to the premature wet and cold weather of October the larvæ tried to feed up too fast and paid the penalty. The only species which seems to have been comparatively exempt from this disease was *subbimaculella*, which, being always a late feeder, would naturally not be so much affected by the bad weather.

A remark with regard to *Nep. quinquella* may not be uninteresting. Mr. Stainton in the Manual says of this species, "used to be common at West Wickham." It does not appear to have been observed again in any quantities until Mr. Meyrick

noticed its occurrence in great abundance in this neighbourhood in 1877 (Ent. Mo. Mag. xiv, p. 111.). The mines were equally abundant in the two following years, then they seemed almost to disappear, and it is only by knowing on what particular trees to look for them that here and there one or two mines can now be found, whereas, during those 3 years of their abundance, 20 or 30 in a leaf was the average number. Perhaps other *Nepticulæ* are subject to the same variation. Last autumn the larvæ of *Nep. ulmivora* were quite plentiful along one small elm-hedge, before which time I had never been fortunate enough to obtain more than an odd one here and there. This year a careful search on three separate days only resulted in half-a-dozen mines. I do not think it has been recorded that, apart from the distinctness of their mines, the larvæ of *ulmivora* may always be distinguished from those of *viscerella* by their blue-green colour.

I have mentioned above the great plentifulness of *subbimaculella*, but numerous as they have been, their numbers have been nothing compared with *rubivora*; and that not only in this immediate neighbourhood, and in Essex, but on the Lincolnshire Coast, where Mr. W. H. B. Fletcher found them in the greatest profusion. This is the third year I have taken them commonly; before 1881 they do not seem to have been noticed or recorded in England. It may be that, like *quinquella*, they too are periodic in their appearance, and will presently again become rare.—W. WARREN, Merton Cottage, Cambridge, November 20th, 1883.

Double-broodedness of Scopariæ.—I am much surprised to read Mr. Sang's note in this month's Ent. Mo. Mag., p. 167, where, writing of double-broodedness in the *Scopariæ* he says, "one can hardly imagine such a thing in that genus." I thought it was thoroughly well known to all who have taken any interest in the group, that *Scoparia muralis* is always double-brooded. I have myself reared the second brood in August from eggs obtained from a June moth, and the habits of the species are precisely the same outdoors. Full-grown larvæ can always be found in abundance under and among moss on our old walls from February to April, and the imagoes are plentiful at the end of May and early in June; but after about the middle of June not an imago can be seen for some weeks, but the larvæ are again feeding, which produce a still more numerous brood of moths at the beginning of August. And although there is certainly not the clear distinction between the appearance of the broods of *ambigualis* that there is in *muralis*, I have little doubt that it also is to a great extent double-brooded. It is always common in June, and although it occurs on the wing all through the summer, it becomes, especially about our moors, very plentiful again in August, and the specimens then are very fine and large. *Conspicualis* has never been looked for in June, but this year one was accidentally taken in that month, but the species not detected until it was too late to look for more. It is always in good condition at the beginning of August, hence I think it is not unreasonable to suppose there may be two broods of it also.—GEO. T. PORRITT, Huddersfield, December 1st, 1883.

Lepidoptera bred from larvæ on Myrica gale in Norfolk, with notes.—During this and last year I collected a number of larvæ from *Myrica gale* (Bog-Myrtle), which produced imagoes of *Tortrix Lafaurryana*, and those of the following:

T. Podana in great variety, some of the forms being different from any I had previously noticed; *T. rosana* in plenty, amongst them some very dark specimens; *T. viburnana* also in numbers; the males of this species, whether caught or bred, are somewhat smaller and darker than my Scotch specimens. I note that the females with long, narrow, and pointed fore-wings are rarely seen on the wing, although they can be obtained in plenty from larvæ; some of my specimens have the fore-wings much reticulated. Of *T. ribeana* and *T. heparana* a few only emerged, whilst *Sericoris lacunana* and *S. urticana* were well represented. A few *Phoxopteryx siculana* were also bred.

Besides the larvæ which produced the *Tortrices* just enumerated, I found those of a *Noctua*. These, from their early habit of feeding between leaves, I at first put in my boxes as larvæ of a *Tortrix*, but as they became larger they left their leafy abode, and disclosed their true nature, emerging from pupæ next spring as *Tanio-campa gracilis*.

Cases of *Coleophora viminetella* were common, but from those collected few moths or ichneumons emerged; the cases of this species on *M. gale* are narrower, somewhat truncate at the apex, less serrated and brighter coloured than those on *sallow*.

Clepsis rusticana is sometimes rather common here among *M. gale*, and doubtless its larva feeds on that plant, but I have not yet bred the species.—EDWARD A. ATMORE, 3, Haylett Terrace, Exton's Road, King's Lynn: December 11th, 1883.

Note on Crambus furcatellus.—I read with interest the article on this species. I may perhaps go a little further back than many of the Entomologists of the present day. I found it in plenty in 1847 near Killin, on a range of hills stretching towards Ben Lawers. It used to be in profusion on Helvellyn, also on Scawfell more sparingly; it requires a good altitude; even Sty Head is hardly high enough; but a few hundred yards further upwards brings you to head quarters; it also occurs on Skiddaw. I have a number of larvæ now hibernated that will, no doubt, produce this species the first week in July next; some were very small early in October, one I saw was about five-eighths of an inch in length; I did not wish to disturb them, they were lying snugly ensconced at the roots of a club-moss that grows where *furcatellus* occurs. The larvæ are of a pale whitish-yellow, with very few hairs on the body, the head very small, shining, and in colour pale ash, no spots visible on the larva; in fact, to sum it up, a bit of horse-radish best describes it. Mrs. Fraser very kindly sent me the larva, of which some day I hope to give a better account.—J. B. HODGKINSON, 15, Spring Bank, Preston: December 3rd, 1883.

Captures of Coleoptera, &c., in the Hastings District in 1883.—Notwithstanding the extreme scarcity of insects, I have done pretty well this year, probably owing to my having had more time on my hands than formerly. As is generally the case in bad years a few species have been commoner than usual. In July the ♂ of *Lampyrus* was abundant at light. I have already recorded the abundance of *Athöus difformis*. The Guestling sandpit has yielded me two specimens of *Leptinus testaceus*, *Pristonychus* somewhat commonly, two or three *Cænopsis*, several *Plinthus*, *Orobitis* in plenty, one or two *Ilyobates nigricollis*, and many commoner things. I have another speci-

men of *Leptinus* which I fancy was taken in the runs of *Formica fuliginosa*. At the entrance to the burrows of the larvæ of *Cossus*, I have found *Cryptarcha strigata*, *C. imperialis*, *Epuræa decempunctata*, *E. obsoleta* (this latter was also common on a wet oak-stump), *Soronia grisea*, a ♂ *Homalota cinnamomea*, and some obscure *Homalotæ*. While fishing in the Rother at Robertsbridge, my brother found a fine *Panagæus crux major* crawling on his trowsers. I have never seen the Camber sandhills so deficient in insect-life since I have collected there. The only things worth bringing home were *Bledius unicornis* and *3-cornis* and *Psylliodes marcida* common on a few plants of *Cakile maritima*.

Since sending the note on the Myrmecophilous *Coleoptera* (Ent. Mo. Mag., xx, p. 40), I have found, in a nest of *F. fuliginosa* at Battle, a specimen of *Myrmedonia lugens*, accompanied by *M. funesta* and *Oxypoda vittata*. In moss at Guestling I have taken *Trachys troglodytes*, *Liosomus troglodytes*, *L. oblongulus* (rarely). *Tychus niger*, *Scydmanus denticornis*, *Cephennium thoracicum*, &c., &c.

The following I have also met with: *Elmis æneus*, Guestling and Fairlight; *Limnius tuberculatus*, Crowhurst; *Anobium fulvicorne*; *Mordella fasciata*, sparingly, Ashburnham and Battle; *Grypidius equiseti*, Battle; *Rhynchites pubescens*, Guestling; *Hylobius abietis*, plentifully, Fairlight; *Callidium alni*, Crowhurst; *Bembidium prasinum*, one at Bulverhithe; *Bryaxis sanguinea*, *Leistus rufescens*, under rejectamenta, Guestling; *Oxyporus rufus*, sweeping, Fairlight; *Antherophagus pallens*, sweeping, Guestling; *Scaphidium 4-maculatum*, in a cart-rut at Guestling, completes the list of the better things.

Hemiptera have been nearly as scarce as the *Coleoptera*, but *Megalocæra longicornis* and *Acetropis Gimmerthalii* were abundant at Fairlight. Thanks to Mr. Herbert Henry, who conducted me to the exact spot at Ashburnham, I was enabled to take *Chilacis typha*, in comparative plenty, in the heads of *Typha latifolia*. It occurred in all stages, both in this year's heads and also, but more plentifully, in last year's. *Anthocoris sarothamni* occurred sparingly on its usual food plant at Guestling. Sweeping has produced *Calocoris striatus*, *C. fulvomaculatus*, and *Nabis flavomarginatus*, all three taken singly at Guestling. On two occasions I have met with *Macrolophus nubilus* by sweeping bracken in places where *Stachys sylvatica* was conspicuous by its absence. *Amblytylus affinis* occurred near Battle pretty commonly. With it were a few *Macrocoleus molliculus*; *Gerris najas* is common on all running water and on the powder-mill ponds; *G. paludum* is to be seen, but rarely caught, except in windy weather, when they generally lie under shelter of the bank.

It may not be out of place to mention* that *Vanessa cardui* has been abundant here as elsewhere, and that I saw a specimen of *Colias Edusa* on the railway embankment at Bopeep the other day. *Vanessa Atalanta* has been far more abundant than of late years.—EDWD. P. COLLETT, 76, Islip Street, Kentish Town, N.W.: October 17th, 1883.

Myrmecoxenus vaporariorum, Guér, &c., at Dulwich.—Among some *Coleoptera* recently named for me by the Rev. W. W. Fowler are two specimens of this insect, taken in either May or June of the present year from a hotbed in this neighbourhood. I was able only to pay one visit to the bed, which was soon after destroyed, so that

my chance of again meeting with the insect is but small. *Balaninus tessellatus* turned up here in some numbers, in company with the commoner species of the genus. I also obtained two specimens of *Phlæotrya Stephensi*, from a birch log, and one *Tillus elongatus* from a spider's web. Towards the end of September I visited my old locality for *Aphodius porcus* at West Wickham, but only succeeded in finding nineteen specimens; *A. obliteratus* was common in the same field. A single specimen of *Stenus geniculatus* appeared among a host of *S. impressus* swept from heather, and *Ceuthorhynchus alliariæ* was also found in the sweep-net. *Prognatha* was rather common under the bark of a felled acacia. A *Cossus*-infested horse-chestnut at Streatham produced *Homalota hospita* in numbers, and from an ash near Belvedere, similarly attacked, I got several *Tachinus bipustulatus*, *Cryptarcha strigata*, and the usual common things.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood, November 23rd, 1883.

Triplax Lacordairei at Dulwich.—A few months since I recorded the capture of *Triplax ænea*, among other *Coleoptera*, in the neighbourhood of Dulwich. Upon more careful examination I find that the insect is the much rarer *T. Lacordairei*, Crotch, a species principally taken, I believe, at Darenth Wood. I took two examples, one of which was unfortunately broken, from toadstools, the first towards the latter part of July, the other early in August. But for the scarcity of fungi in the district I should doubtless have met with further specimens.—ID.: December 6th, 1883.

Ægialia rufa, F., at Wallasey.—During the past season I had the good fortune to take two specimens of this rare beetle, one in May and another in June, on the Wallasey Sandhills, Cheshire. I found them crawling on the bare sand along with *Æ. arenaria*.—R. WILDING, 40, Downing Street, Liverpool: December 12th, 1883.

Harpalus quadripunctatus, Dejean, from Somersetshire.—In overhauling my *Harpali* lately, I made an interesting discovery, viz., that amongst my exponents of *H. latus* was a specimen of *H. quadripunctatus*, Dej., which reference to my journal proved to have been captured on the Mendip Hills during my visit to Somersetshire in April, 1877. Judging from the wide European range of this species, I see no reason why it should not be found in suitable localities throughout England and Wales, as well as Scotland. My specimen proves that it occurs in England, and suggests the probability of its actual existence in collections mixed up (as in my own case) with *H. latus*. My specimen is also interesting in another way—the usual row of large punctures in the third interstice number *four* on the left elytron, and *three* on the right, showing that discrepancies on this point by different authorities are due to inconstancy on the part of the beetle, and not to confusion of species by the "Doctors."—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: December 17th, 1883.

Obituary.

Dr. John L. Le Conte.—This distinguished entomologist was the son of Major Leconte of Philadelphia, himself a writer on entomology, and well known as the correspondent of Dejean and other prominent men in this department of science

in the early part of this century. Le Conte's attention was thus early directed to the field in which he became so renowned, and being a man of great courage, self-reliance and energy, he, as long ago as 1844, intimated his regret at seeing American insects going to Europe for determination and description, and set himself to remedy this by doing the work himself. This task he has carried on with unfailing energy for about forty years, the result being, that in this period, he has named and described about 5000 species of North American *Coleoptera*, and characterized about five hundred genera. It is, however, as a writer on the classification of *Coleoptera*, that he has gained his widest reputation. Having to study and arrange a comparatively unknown fauna, he investigated the classifications in vogue, and scarcely ever failed to suggest important modifications and improvements; in 1861—2, his work on the classification of North American *Coleoptera* was published by the Smithsonian Institute, but was left uncompleted till the spring of the present year (1883), when a second and complete edition was brought out with the assistance of Dr. Geo. H. Horn. His labours were recognised in Europe by his being elected honorary member of most of the more important Entomological societies, and in 1874, he was President of the American Association for the advancement of science. For many years he was almost the sole Coleopterist of ability in North America, but recently he had been much assisted by his fellow-citizen, Dr. Geo. H. Horn. Le Conte's health had for some year or two past given anxiety to his friends, as he had threatenings of apoplexy, and on the 15th of November last he died. He held an appointment in the American Mint at Philadelphia, and was, we believe, about 66 years of age, the date 1825 given in Hagen's *Bibliotheca** as the year of his birth, being erroneous. His important collection of North American *Coleoptera* will go, I understand, to the Museum at Cambridge Massachusetts.—D. SHARP.

ENTOMOLOGICAL SOCIETY OF LONDON: 5th September, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

Baron C. R. Osten-Sacken, of Heidelberg, was elected a Foreign Member.

Sir S. S. Saunders exhibited examples of the true "*Cynips caricae*," of Hasselquist, obtained from Smyrna figs, and gave interesting details of the history of the species, and of the errors that had occurred in connection with it. Some unknown depredator entered the figs and destroyed the insects, for there were the remains of many individuals indicated only by the apex of the abdomen and long, hard ovipositor. The larva of a *Chrysopa* had also been found in the figs.

Mr. Enock exhibited a very fine hermaphrodite example of *Macropis labiata*, in which the external characters of both sexes were distinctly represented, and the genitalia also appeared to refer to the two sexes. He remarked on the rarity of gynandromorphism in bees, and it was suggested that a full description (with figures) should be drawn up of this example.

Mr. Coverdale exhibited *Grapholitha cæcana*, Schläger, taken by him at Deal, and new to Britain; cf. Ent. Mo. Mag., ante p. 83.

The Rev. H. S. Gorham read a paper on the *Lycidæ* of Japan, with introductory notes, which gave rise to considerable discussion.

* Hagen simply says "1825." Henshaw, in Dimmock's "Special Bibliography" says "May 13th, 1825," the information having been obtained from the American "Popular Science Monthly" for 1874.—EDITORS.

NATURAL HISTORY OF *AGLOSSA PINGUINALIS*.

BY (THE LATE) WILLIAM BUCKLER.

I figured the larva of this species in April, 1860, from an example found in the Corn Exchange at Chichester, but did not then study its habits; nor indeed did I doubt the usually accepted account of them for twenty-two years after, until in 1882 Mr. W. H. B. Fletcher kindly sent me, from Thetford, a few eggs, laid by a female he had taken in a barn, and with them a supply of rubbish swept from the barn floor, amongst which he supposed the larvæ would find their proper food; this struck me at once, and I was still more interested when the eggs hatched, and the young larvæ seemed to be thriving, which induced me to study their habits as closely as possible, and also to investigate the origin of their being credited with feeding on fat and greasy substances.

That the latter part of my task has been accomplished is due to Mr. H. T. Stainton, who, with extreme kindness, expended much time and labour in research, and in furnishing me with a complete transcript from De Geer's "*Mémoires*" Tome II. 1^{re} partie, p. 371, in which both Réaumur and Rolander are cited; such effectual help claims my grateful thanks!

Réaumur I have no doubt knew the larva and its habits, for I consider that the figures (Pl. 20, *Mémoire* 8,) as well as the description of his "*fausses teignes des cuirs*," apply to *pinguinalis* and not to *cuprealis*; but it was Linnæus who bestowed the specific name—*pinguinalis*—relying, doubtless, on what Rolander had said of it, and thus gave the stamp of his great authority to a mistake, which has passed current for truth ever since.

Next we have De Geer, who, in relating what he knew himself of the larvæ, says "It is in the rooms and entrances that I have often found them, crawling on the floor or climbing against the walls, and only in such places that I have met with them. They were almost always come to their last stage of growth, so that when one rested it was only to become a pupa."

Again, after stating what Réaumur had said of the larva making itself a tube, and gnawing leather coverings of books, and feeding on dry bodies of dead insects, he continues "I have had no opportunity to see their lodging nor how they feed themselves; it is always in spring or commencement of summer that I have found them, crawling in the rooms and against the walls of the entrances. They are not willing to eat at that time, but are all one after another preparing to become pupæ."

Having thus said what he knew himself, he goes on—"M. Rolander,

who has also followed the history of these larvæ in the place I have cited in the *Mémoires de l'Académie des Sciences de Suède*,* said that they fed on many sorts of eatables, as lard, butter, and dried meat, and for that reason they willingly dwell in the larder, and in the offices. He has seen them eat butter and lard with avidity. He has also rubbed all the body with lard and with butter, without their having appeared to suffer injury; one knows that the ordinary larvæ are suffocated, as soon as one stops their spiracles with oil or some other greasy matter. But M. Rolander has remarked, that the larvæ are able to hide their spiracles in folds of the skin, to avoid their being wetted and stopped by the greasy materials which surround them."

"He does not say that he has seen them reside in coverings in form of fixed tubes; he appears not to have known, that M. de Réaumur had before spoken of these larvæ under the name of '*fausses teignes des cuirs*,' because they inhabit a fixed sheath: for he said they had not been described by any author."

Now, after my recent experience, the foregoing extracts afford me most convincing evidence, that Rolander was not really acquainted with the larva until it had ceased feeding, and I think I shall presently prove this; and I can only suppose that he must have somehow deceived himself in imagining that which he asserted of *its food*, and of *its spiracles*, ingeniously suiting the one to the other; but it seems something more strange, that for more than a hundred years, all authors who have written on the *Pyrilides* have gone on copying the above, and commenting on it as one of the stock *facts* in this branch of Natural History.

To return to the record of my experience with the eggs sent me by Mr. Fletcher, when I received them on 11th of August, they were only just in time, as two of them hatched in the evening of that day, and five more the next day; I put the larvæ at first on a little of the barn sweepings in a glass-topped box, in order to observe, if they fed at all, what they would choose; for these sweepings consisted of a variety of things, such as husks of wheat and of oats, small fragments of straw and of *Cladium* thatch, also of the pods of beans, small seeds of various plants, short bits of grass and other dried stems, some woolly dust, and a few empty pupa skins in cases of some small species of *Lepidoptera*, all mixed up together with much chaffy and earthy matter.

Into this mixture the active little creatures at once went down out of sight, and did not show themselves at all while they remained

* Rolander, *Mém. de l'Acad. de Suède*, Ann., 1775, p. 51, Tab. 2.

in the box for twelve days, I then began to look for them, and found some small earthy particles of the rubbish adhering slightly to the bottom of the box, and under these I saw three larvæ, and a fourth lying under a morsel of old straw; after this, I removed all into a pot provided with more of the sweepings; later still, I began to realize the hazard of satisfying my curiosity while inspecting their progress from time to time, as I was obliged to turn them out of their tubular dwellings, which were of rather tender construction; and for some time this work of danger resulted in casualties, until after fatally injuring several larvæ, I was impelled to invoke help from Mr. Fletcher, between whom and myself many communications had passed at intervals concerning these larvæ, and on the 24th of September, he most kindly sent me six of part of the same brood he had been rearing for himself: and of these again, after they had wintered safely in a more or less torpid condition, I was unfortunate enough to injure several in the following spring, and in April found I had only two survivors: one of these fully grown, after abandoning its tube, crawled about and remained exposed on the side of the pot for a day or two, but finally retired to the bottom, on which it spun up in a firmly fixed cocoon on the last day of April, and I bred the moth from it on 14th of June: the second was kept in another pot, wherein it eventually during May spun its cocoon, and changed to a pupa, of which I secured a figure and description before the imago came forth on the 8th of July.

Meanwhile, I resolved to make acquaintance with the larvæ in their native haunts, and early in May sought for them in a farm stable, and there, by help from a small boy, on several occasions during that month, a number of them were discovered, enabling me thoroughly to learn their natural mode of life: the place in the stable where they were found was a dark corner between the oat-bin and north wall, in a very narrow interval of space between the two, into which some of the hulls and chaff would often be falling amongst the particles of straw accumulated there, whenever the bin was opened for feeding the horses; the larvæ were almost all on the floor in a cool and slightly damp temperature, inhabiting tubular residences of various lengths, quite flexible and adaptable to any surface, and as all these tubes were more or less covered with small fragments of straw and wheat husks, they, while being removed, appeared like strings of rubbish, accidentally held together without any visible means of cohesion, until the fragments were plucked away, when the dirty coloured silk would betray the residence of a larva, which never showed itself in any instance until turned

out. Some of these larvæ I sent to Mr. Hellins, who examined them for me under his microscope, and confirmed my view of their structure.

Towards the end of June, Mr. Hellins made further acquaintance with this species; he had gone with his nephew to fish in the Exeter canal, but, to use John Leech's explanation of one of his pictures of Mr. Briggs, "the wind that day was not in a favourable quarter," and so, to avoid a drenching from the S.E. rain beating in from the sea, they had to take shelter in a stable, where presently they observed a specimen of the moth sitting on the brick wall, and before long ever so many more, and, while trying to count them, they noticed several of the cocoons spun in the mortar-grooves between the bricks, at a height above the ground of from three to five feet, some perhaps more, clear away from the ledges of the rack and manger, where the larvæ must have fed on the matted and dusty hay seed husks; they noticed no straw in the stable, but only a coarse kind of hay, made from grasses and herbage grown on the canal banks, amongst which could be distinguished the seed-heads of *Holcus lanatus*; quantities of this chaffy rubbish filled the chinks, and lay about on all the ledges with a thick matting of dust, and from a farrago of this nature they stirred out two or three of the larvæ; they carried home five or six cocoons, and in a day or two bred two of the moths, and sent the remaining cocoons to me, and I also bred from them two *pinguinalis* on 14th and 19th of July; whilst from the larvæ I had myself found, the moths continued to appear from 25th July to 7th August.

From these observations I think it will be seen that the larvæ live in comparative darkness, in stables, barns, and outhouses, amid accumulations of the rubbish above mentioned, hidden within a protecting sheath or gallery nearly or quite close to the ground, composed of materials in which they find both their food and their covering; unless disturbed, they are never to be seen whilst growing, as they do not voluntarily leave their abodes until full-fed, but then only do they desert their quarters, and may occasionally be observed ascending walls to find a suitable place for pupation.

The egg of *pinguinalis* is of a good size for the moth, of a roundish-oval form, almost globular, though there is a bigger and a smaller end; the shell, dull and granulated all over, is whitish or creamy-white; a few hours before hatching a light brownish patch shows through one end of the shell, and a very faint pinkish-grey tint on other parts.

The newly-hatched larva is of a very pale whitish flesh-colour, with yellowish-brown head, and plate separated from it by a margin

of pale skin, a similar brown plate is on the anal flap. When twelve days old, the internal vessels appear full of food, and as the size increases the alimentary canal acquires more and more of a dark grey colour, showing very plainly through the clear almost colourless skin.

When six weeks old they become of a dingy grey-brown colour, almost approaching to blackness. On 25th September, I chanced to notice one larva, which appeared nearly ready to moult; it was then dark grey-brown at each end, and whitish-grey along the middle segments of the body, where the dark dorsal vessel showed through, but interrupted at the segmental folds of pale skin; this larva I kept apart, and in a few days it moulted, and became as dark as any of the others.

On 27th September, the smallest was from 9 to 10 mm., and the largest 13 mm. long; the head jet-black, the plate nearly as black, and also three or four following segments, this hue from thence melting gradually into slaty-grey, whereon the minute tubercular black dots appeared; the anal plate brownish-black, and dull. The individual kept apart from the others had increased to a length of 17 mm. by the 11th of October, when it was of a slaty blackness. By 13th of November, most of the others had grown to be 20 mm. long, inhabiting, as I said before, long soft tubes of dark grey-brown silk, smooth inside, but covered externally with quantities of the sweepings; the larvæ I turned out to inspect were now entirely black, excepting the pale upper lip, papillæ, and the legs, which were all semi-pellucid and light drab-coloured; a great number of pellets of black frass appeared in the pots, these I was careful to remove on all occasions of replenishing the supply of sweepings.

I did not disturb them again until 4th of March, 1883, after keeping them through the winter in a cool dark place, and then I found they had not grown at all in the interval, but during the next twenty days their tubes increased to a length of two and a half inches, and the agglomerations adhering made up roughly a transverse diameter of about three quarters of an inch.

As stated above, all this investigation of the growing larvæ was made at the cost of the lives of most of them; however, at the end of April, there still remained two alive, and from them, and also from other examples captured when mature, I made the following description.

The full grown larva is from 25 to 29 mm. in length, almost uniformly cylindrical throughout, though rather stoutest at the third and fourth segments, which have deeply sub-dividing wrinkles, and on each of the following segments to the twelfth is one deep transverse

wrinkle a little beyond the middle ; sometimes faint indications of one or two more occur near the end, without detracting from the general plumpness of outline ; the segmental divisions are well cut, the anal flap plumply rounded off behind ; the tumid ridge below the spiracles is very prominent, the belly flattened and deeply wrinkled ; the dorsal tubercular dots each with a fine hair are arranged rather in a square than a trapezoidal figure ; the spiracles are very flat, situated just below each lateral wart where the skin is very plump, and in no way hidden or protected by any wrinkle or fold : the colour is generally black or blackish-brown, sometimes a little bronzy, the head having a pale bar of greyish-drab across the upper lip, the papillæ of the same pale colour, all the legs drab ; the belly appears like rather worn bronze, the spiracles are black like the skin around them, and therefore are rather difficult to discern.

The pupa is about 13 mm. in length, and nothing unusual in form ; the moveable segments of the abdomen are deeply cut, and furnished at the tip with four fine curly-topped spines ; its colour is of a dark brick-red, and with a dull surface, though in the divisions of the moveable rings it glistens a little.

The cocoon, firmly attached to some solid surface, is of broad-oval form, composed of greyish silk, on which the spines of the pupal tail obtain a firm hold ; it is covered externally with particles gnawed from the surface of its surroundings, whether of rubbish, or of mortar, like those from the Exeter canal stable, or indeed of paper, as I found many years since, when a cocoon was spun in a box of that material.

There now only remains for me to state that on two or three occasions, when I had a larva out before me to examine, I did not neglect to test the grease theory, by leaving butter and lard with it under a large glass, but in every case it seemed carefully to shun both, and though I contrived once that it should at least walk over some lard, it did so nimbly enough, but could not be induced to walk over it a second time, invariably swerving aside. As a final experiment, I turned a large but still feeding larva out from its dwelling into a pot containing three pieces of cloth, one piece lightly saturated with salad oil, the second bearing a lump of fresh butter, and the third a lump of lard, and tied over the pot a cover of calico ; on being placed therein, the larva soon came in contact with a piece of cloth, and stopped as though afraid to advance any further ; but on my looking next day I could only see the tail of the larva protruding from beneath the lard-bearing cloth, and on my touching it with a soft brush very gently it instantly sprang forward, concealing itself entirely under the cloth ;

on the third day it was close by the same piece of cloth, but not under it, and on touching it I found it dead, hard to the touch, and rather swollen; neither butter, lard, nor cloth had on examination been nibbled at all, though there were traces of the larva having crawled all over most of the bottom of the pot; neither fat, therefore, nor greasy cloth, offered any attraction in the way of food, nor did the larva seem proof against the usual harm which contact with oil or grease causes to insect life; but, on the other hand, I confess I never saw a larva actually eating any of the rubbish, on which I believe it must have fed: I found whenever I turned a larva out of its abode, and supplied it with fresh materials to feed on, it immediately began to unite some of the particles together, to cover itself with a new residence, so that it would not feed until out of my sight and in darkness, and thus all my attempts to see it actually eat were frustrated by this habit. Perhaps, indeed, *dried meat*, which was one of the substances mentioned by Rolander, might be eaten, especially if it had become quite hard and tasteless; in this state it would not be very much unlike the leather of the book covers on which Réaumur found the larvæ feeding; and, as a concluding observation, it occurs to me to remark, that he must have kept his library in a state of dust, and never let the maids "put it to rights," or he would not have found his game so close at hand!

Emsworth: *January 2nd*, 1884.

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

(Continued from page 175.)

In my last paper I spoke chiefly of the outfit of an entomologist in Central America, now I will tell him what he is likely to find in his excursions, commencing with the "tierra caliente," or low country (below 1000 ft. elevation) of Chiriqui, or that part of the State of Panamá immediately adjacent to the frontier of Costa Rica. To reach the virgin forest, of which there is still plenty remaining, not only in the low country, but almost everywhere on the mountain slopes, the traveler will probably have—if he is staying in any village or settlement—to ford one or two rapid rivers or streams, full of great, loose, slippery boulders, and nearly dry in the dry season, but, perhaps, up to his middle in the rainy; then most likely some "nastrojos," or second growth forest of quite a different character and different vegetation to

the virgin forest, and consisting principally of arborescent *Compositæ*, *Solanaceæ*, and *Leguminosæ*, till at last he will find himself in the forest—lofty trees compared to which our highest trees are but dwarfs, spindly palms going straight up 30 feet or so, and looking as if they would topple over every moment, as perhaps they would if they were not protected by their stilt-like roots growing several feet out of the ground, with undergrowth of smaller trees, smaller palms, and in damp places tree-ferns and *Bambusæ*, lower still great broad-leaved *Heliconia* (*Musaceæ*) and allies, ferns, *Arums*, &c.; and on the ground in some places mosses, *Lycopodiums*, *Begonias*, &c.; he will rarely see any flowers in the forest itself, excepting in the dry season, when now and then a lot of flowers will be seen on the ground, fallen from some lofty tree, perhaps leafless at this season, and the particular tree from whence they came almost indistinguishable, nor will he find anything he can satisfactorily sweep for insects. The branches of the trees are covered with *Epiphytes* (*Orchids*, *Arums*, *Bromelias*, &c.), and hanging down from them lots of rope-like lianas or vines (*bejucos*), often reaching the ground and taking root in the soil; climbing plants innumerable; palms, ferns, *Arums*, *Passifloræ*, &c., he will find running up the trunks, and all over every tree; palms with spines as sharp as needles, large trees with spines all over the bark, spiny creepers; in fact, a thorny path everywhere.

In the height of the rainy season, it is almost impossible to get about in boots: the paths where they exist, and if used at all, will be nothing better than series of mud or water holes, with here and there stumps, tree-roots, or stones, to say nothing of innumerable small streams; if the collector wants to do much at this season he will have to go native-fashion, barefoot; in the short dry season, however, it is possible to get about almost anywhere, though he will not find nearly so much to repay him for his work.

Insects, as a rule, excepting ants (long processions of the leaf-cutting *Ecodomæ*, carrying in their mouths pieces of leaf much larger than themselves, and vast armies of *Ecitons* are to be met with everywhere); *Termites* (the hard, black, earthen nests of which look a ^{good} ^{many} like niggers' heads on a large scale, and frequently to be seen ^{dropped up} ^{between} ^{forked} ^{branches} ^{or} ^{upon} ^{the} ^{tree} ^{trunks}) do not abound, still there are very many species to be found by hunting; the best time for collecting is during the mornings of the commencement of the rainy season in May or June, at this season the magnificent blue *Morphos* of perhaps three species—*M. Amathonte*, *Peleides*, and *Cypris*—sailing leisurely (till one gets near them) through

the opener parts, rarely settling and rarely coming within reach of the net; the gigantic *Caligos* always settling on tree trunks in the shade, and if disturbed flying a short distance to rest again in the same manner, *Paphia*, *Opsiphanes*, *Gynæcia*, *Epicalia*, *Catagramma*, and *Protogonius*, often on excrement, &c., on the ground, and not seen till nearly trodden upon; when they fly off wildly to settle on some tree-trunk or leaf; the beautiful transparent-winged *Callitæra*, seen by its rosy-pink patch for a moment only as it crosses the path; a good many species of *Satyridæ* in the dense undergrowth, flying very near the ground; various *Euptychiæ*, *Mesosemia*, and other *Erycinidæ*, many *Heliconiadæ* (*Heliconius*, *Ithomia*, *Mechanitis*, &c.), the transparent-winged *Leptalis*, so like *Ithomia*, many *Hesperidæ*, *Apatura*, *Heterochroa*, and other *Nymphalidæ*, and others will be found in the opener parts of the forest; *Castnias*, flying wildly, *Glaucopis* and allies (some of which, while on the wing, are absolutely indistinguishable from wasps) flying about the low undergrowth, various day-flying *Heterocera*, some of which so mimic *Heliconius*, *Ithomia*, and other butterflies, as to constantly deceive the collector; various *Lithosiæ*, *Notodontæ*, *Geometræ*, and *Pyrales*, will occasionally fly out or fall on to the beating net; of the *Micros*, very few species will be seen beyond an occasional *Tinea* or plume.

The Coleopterist will probably be very much disappointed at first, plenty of butterflies may often be seen when scarcely a beetle is to be found; general beating, as a rule, is not productive, unless on the margin of new clearings, or where the sun penetrates freely; the great thing is to find a new clearing in the forest, and these to any extent are only made by the natives in the dry season (December or January, so as to burn in March)—not by any means the best time for the collector; however, now and then, one does find a clearing or freshly fallen trees, then is the time, almost before the trees are down, beetles begin to appear—Longicorns (I have taken perhaps 100 species in one clearing, by constant hunting day after day for a fortnight), *Elateridæ* (*Semiotus*, *Chalcolepidius*), *Anthribidæ*, *Brenthidæ*, *Trogositidæ* (*Temnochila*), *Histeridæ* (*Hololepta*, *Tryponæus*), *Scolytidæ* (especially *Platypus*), *Colydidæ* (*Colydium*, *Aubonium*), various *Cleridæ*, *Lycidæ*, *Buprestidæ*, &c. The best way to find many of these, especially the Longicorns, is to crawl over the fallen trees the best way you can and examine very carefully the shady or under-side of the trunks and branches, even to the smallest twigs, many of the smaller Longicorns, &c., are so active, taking to wing directly they are approached, that it is little use beating for them, diligent search-

ing will pay better ; some species run about very actively on the logs in the hot sun, as *Clytus*, *Calichroma*, *Trachyderes*, various *Anthribidæ*, *Brenthidæ*, and *Cleridæ* ; also *Euchroma* and a few other *Buprestidæ* (*Chrysobothris* and allies). These last named like the hottest sun, and are as active as flies. Large number of beetles, &c., occur in withered leaves of the fallen tree-tops or branches, in fact, this is one of the best methods of collecting in the forest ; many moths, *Hemiptera*, Longicorns (*Estola*, *Jamesia*, &c.), that are never seen on the trunks or branches, may be found in this way, some *Carabidæ* (*Lebia*, *Agra*, *Ina*, *Colpodes*, *Calleida*), *Cicindelidæ* (*Otenostoma*), *Heteromera* (*Ap-sida*, *Hegemona*), *Cleridæ*, *Trogidæ*, *Telephoridæ*, *Staphylinidæ* (*Pæderus*, *Quedius*, *Pinophilus*, *Palaminus*), *Anthribidæ*, very many *Curculionidæ*, and others.

In the clearings, as they get older, or after they have been burned, and while you can still get about them before the crop of rice or maize prevents you (and if there is plenty of black fungoid growth about the fallen logs, as is usually the case), many different species begin to appear, as a good many *Heteromera* (*Spheniscus*, *Nyctobates*), *Erotylidæ*, *Endomychidæ*, and some few *Buprestidæ*, *Anthribidæ*, and Longicorns, not before seen ; a sappy log will probably contain many *Brenthidæ*, *Piestidæ*, *Dactylosternum*, *Temnochila*, *Hololepta*, *Hypophylæus*, *Morio*, and others, under the bark ; a good many *Carabidæ* (*Coptodera*) running on the sappy bark ; and, perhaps, the fine *Heteromeron*, *Phrenaptes*, in the decaying wood ; older logs will contain various species of *Passalidæ*, and fungi on these same logs will produce *Erotylidæ*, *Carabidæ*, allied to *Lebia* (these prey on small larvæ), *Gyrophæna*, and other *Staphylinidæ*, &c. In addition to some *Cleridæ*, many *Curculios* (suggestive of *Cæliodes* and *Ceuthorhynchus* on a larger or smaller scale) run about in the hot sun on the bark of dead or fallen trees, most of these are exceedingly wary, flying off at once, and seldom to be caught with the fingers, though they can be brushed into the net ; general beating in the forest itself will not produce very much beyond species of the *Anchomenus*-like *Colpodes* (so numerous in species, about 140 are now known from Central America) *Calleida*, *Lebia*, various *Lycidæ*, *Lampyridæ*, *Chrysomelidæ*, some *Heteromera* (*Strongylium*, *Statira*), *Telephoridæ*, *Curculios*, and others ; in the rolled unopened leaves of the banana-like *Heliconiæ*, many smooth flattened *Hispidæ*, some *Carabidæ* (*Calophæna*), and *Cassidæ* will be found. These insects may also be seen in fine weather sitting on the leaves, dropping down into the leaf again when approached ; sitting on leaves in the forest in sunny places, a good many *Hispidæ*, *Chryso-*

melidæ, minute *Buprestidæ* (*Brachys*), some very bright metallic *Onthophagi*, and various *Lampyridæ* and *Lycidæ* will be found, by searching in this way very often far more will be found than by beating; great, black, greasy-looking *Calandræ*, and sometimes *Cetoniidæ*, will be found flying with a loud humming noise in the hot sun, about the sap of fallen *chonta* and other palms. As soon as it begins to get dark in the dry season the "cocujas," or *Pyrophori*, are to be seen flying rapidly in a straight line through the undergrowth; lots of *Lampyridæ* will be met with in the rainy season; these latter have an unsteady, undulating sort of flight, very different to *Pyrophorus*, the smaller species generally keeping low down about small bushes, some quite close to the ground. They do not retain their light nearly so long at a time as *Pyrophorus*, some flashing very frequently; though often found in large numbers, each one appears to take his own course. I never saw anything I could call a flight, nor any flashing in unison amongst the very large number of species collected by myself; many species appear to be very local, especially when one ascends the mountain slopes, where, with every 1000 feet ascended, different species are to be met with; nearly all the Central American species appear to be winged in both sexes.

A good many *Hemiptera*, especially *Reduviidæ*, occur in the forest, some species are common on fallen timber, one in particular (a *Reduid*), with curious scarlet leaf-like appendages to the apex of the abdomen, and the abdomen itself covered with a sticky sort of substance, preys upon freshly-emerged Longicorns, &c., and I have often seen it with its rostrum buried in the bodies of other insects, anointing them well with the sticky substance before sucking them dry. This species, like most *Reduviidæ*, is very evil-smelling; they require to be handled as carefully as wasps, their bite is like the prick of a hot needle; some fine *Aradidæ* occur under bark, and a good many *Coreidæ* and *Pentatomidæ* on leaves or on the wing. Some fine dragonflies—species with exceedingly long bodies and long wings, and the apices of the latter tipped with yellow, white, or blue, occur in the damp forest; they are seldom, if ever, seen near water.

Some large *Hymenoptera* (*Pompilidæ*) are common in the fresh clearings, where they hunt for spiders and insects amongst the fallen timber.

On the margins of the forest, and in the second growth, a good many different species will be found, as the *Acrææ*, many *Pieridæ*, *Papilionidæ*, *Theclæ*, *Hesperidæ*, *Erycinidæ*, &c.; the fresh growth springing up about new clearings (the natives are frequently clearing

to plant sugar-cane, coffee, rice, maize, tobacco, &c.) is often alive with beetles—*Phytophaga*, *Carabidæ* (*Onypterygia*), *Heteromera* (*Stattira*), *Hemiptera*, &c.; a “platanal” (plantation of bananas or plantains), if in a damp place, is sure to be productive, the withered or dead hanging leaves forming first-rate traps for all kinds of insects—moths, beetles, *Hemiptera*, &c. (as well as spiders and land shells). In the patches of wood on the hot “llanos,” or savannas, many insects may be found sitting on leaves, as various *Hispidæ*, *Chlamys* (these are exactly like the excrement of Lepidopterous larvæ), &c.; by brushing about the low bushes with a gauze net—it is little use beating—a good many *Cryptocephalidæ*, *Clythra*, *Chrysomelidæ*, and *Hemiptera* will be obtained; large *Coreidæ* and *Pentatomidæ* are more abundant in these places than in the forest, they like the hottest sun; some few *Lepidoptera* more fond of the sun will be met with here—*Theclæ*, *Siderone*, *Paphia*, *Ageroniæ* (always on tree trunks), *Prepona*, *Synchloë*, *Colænis*, some *Glaucopis*, *Urania Leilus*, and the like; and on the banks of the streams lots of *Terias*, *Callidryas*, *Papilio*, and *Callicore*; some nice little *Erycinidæ*, darting about for a moment to settle again beneath leaves (their wings spread out horizontally at rest), are often met with in early morning. The flowers of the mango, guava (*Leguminosæ*), and other edible fruit trees, appear to be very attractive to insects—to *Hesperidæ* in the day-time, and to *Sphingidæ* in the short twilight. Excrement on the plains and elsewhere will contain *Phanæus* and other *Copridæ*; fallen rotten fruit (oranges, pine-apples, bananas, cacao, &c.) swarm at times with *Nitidulidæ* and *Onthophagi*; carrion is not easy to find, the turkey-buzzards devour it so quickly, and in consequence very few *Necrophaga* are to be met with, dead beetles (*Pussalidæ*) have more than once produced me species of *Aleocharidæ*! the flowers of *Arums*, and the decaying roots of the pine-apple-like plants called “pinuela,” often contain lots of Lamellicorns (*Cyclocephala* and allies) and *Nitidulidæ*; lots of *Epilachna*, *Phytophaga*, and *Hemiptera* will be found sunning themselves on the leaves of *Cucurbitaceæ* (melons, squashes, &c.); and some pretty little *Coccinellidæ* on the orange trees.

Exceedingly few Lamellicorns of the larger species (*Dynastidæ*, &c.) will be found by the ordinary collector, though they are there; I have had the remains of *Megasoma elephas* and *M. Hercules* brought me more than once, though I never met with them myself; *Buprestidæ*, except small species, and the giant *Euchroma* are poorly represented; no species of *Carabidæ* larger than *Agra*, nothing to compare in size with our *Carabi*; *Staphylinidæ*, if worked for, very numerous in species.

The "manglares," or mangrove swamps, which are found everywhere along the coast in this part of the world, seem quite unproductive in insects, always excepting *Culicidæ*; on the sea beach, a *Cicindela* or two and *Phaleria* are almost the only things to be found.

Cicadæ abound in the dry season both in the forest and in the open country; the *Fulgoridæ* are not rare in the forest, they are very sluggish in their habits, and appear to sit in one spot for days together on the tree trunks, especially near the ground.

Minute ticks, or garrapatas (*Cuscusa*), are a great pest in Tropical American forests in the dry season, frequently swarming all over one, so that on returning home there is no alternative but to strip, and mosquitoes and other *Diptera* are sometimes very troublesome, though, fortunately, there are no land-leeches as in the east; snakes are only too common in these very hot damp forests, the majority, however, large as they are, are of innocuous species; in the forest amongst the dense vegetation, in hunting about the fallen timber, and while beating (I have beaten them on to my net several times), it is, of course, necessary to keep a sharp look out; in the rainy season they are sluggish, and you are apt to tread on them, but in the dry season they are so active that you can seldom get very near them; in pulling off bark with the fingers, as one very often does, you have to be a little careful not only of snakes, but of scorpions, both of which are very fond of hiding beneath loose bark.

The above will give some idea of what the entomologist will find by working in Central America, not so much as would be obtained more south (Brazil, Ecuador, &c.), still, the fauna is a very rich one. I do no more than give the result of my own experience.

(To be continued).

ON THE MALE OF *ZARÆA FASCIATA*.

BY J. A. OSBORNE, M.D.

Thanks to the kindness of Mr. E. A. Fitch, who has been good enough to send me some numbers of the *Entom. Nachrichten* for the year 1878, I am enabled to estimate more accurately the real scarcity of the ♂ of this species, and to forward a description of it, which may not be unacceptable under the circumstances.

After having, in a previous number, invited correspondence and specimens, Dr. Kriechbaumer of Munich published in the No. of the *Ent. Nachr.* for June 1st, 1878, an elaborate and, as it seems, exhaustive investigation, extending over 8 pages of that journal, into the

recorded descriptions of *Z. fasciata*, Mas., arriving at the somewhat negative result that most of them are incompatible with one another, and that he remained in doubt whether any of the insects described as ♂ *fasciata* belonged to that species at all, or whether, in fact, any ♂ *fasciata* had ever been met with. When I mention that among the authors whose descriptions are discussed are included the names of Linnæus, Jurine, Le Peletier, Fallén, Klug, Dahlbom, Zaddach, and Thomson, and that the result was what I have stated, it is obvious that the authentic discovery of a ♂ *Z. fasciata* must have a considerable interest for entomologists. Such a discovery followed speedily on the publication of Dr. K.'s paper, and was announced in the No. of the Ent. Nachr. for July 15th, 1878. Herr Gutsbesitzer Kuwert, of Wernsdorf, near Tharau, in Old Prussia, in whose neighbourhood the species is only too abundant, and who "believed to remember having once taken it *in copula*," after considerable difficulty at last succeeded in capturing a ♂ in June (or July) on a larch tree. From this specimen he furnishes the following description:

"*Zaræa fasciata*," L. Mas.

"The whole abdomen, inclusive of the first segment, is black. It is narrower than in the female. The last and penultimate segments have on the dorsum a median [longitudinal] groove, and are more strongly covered with black hairs at the sides. The metallic-brownish coloration of the abdomen in the fresh female has given place to a deep black. The eyes . . . meeting above, cover the whole vertex and hinderhead. Size in both sexes the same; likewise the band upon the wings."

With this description my specimen tallies accurately. I would add, however, that (in mine) there is likewise this difference from the ♀, that all the tibiæ and tarsi are light brown; and that the lateral tufts of black hair, especially prominent on the penultimate segment, give an almost trifid appearance to the apex of the abdomen which is very striking to a superficial view. The dead black of the body excludes from the comparison most of the supposed males of *Z. fasciata* described, after Jurine, as "bronzée," "nigro-æneus," or as having coppery or metallic reflexions. Zaddach's description of his ♂, as having the legs, from the knees down, yellow, recalls a similar feature in my insect, but differs in several other particulars, especially in the quadrate velvety spot on the abdomen.

Kuwert concludes his paper with the expression of his opinion that only Linnæus, of all those authors mentioned, had described the

♂ *fasciata* from an actual specimen of the species ; I cannot, however, help echoing the wish of Dr. Kriechbaumer (*loc. cit.* p. 142), that some London Entomologist would examine the Linnæan *type* if it is still preserved in the Linnæan collection there.

Whether any further discoveries of this ♂ resulted from Dr. K.'s paper, which seems to have awakened considerable interest at the time, I have no means of knowing,* but in any case the confirmation which my recently found specimen affords, seems to be not altogether superfluous.

Milford, Letterkenny :

December, 1883.

[I have examined the "Linnæan" collection, and find therein two examples of *Zaræa fasciata* ; both are females : one of them bears a label in Linné's hand, and is presumably his type.—R. MC. LACHLAN.]

BRITISH HOMOPTERA.—ADDITIONAL SPECIES.

BY JAMES EDWARDS.

THAMNOTETTIX STUPIDULA.

Thamnotettix stupidula, Zett., Ins. Lapp., 294, 9 ; J. Sahlb., Finl.-och Skand. Cicad., 216, 8.

Above sordid greenish-yellow with fuscous or black markings : vertex in front with two triangular dark fuscous spots placed transversely, their bases parallel, separated by a line of the pale ground-colour, and their apices drawn out in a linear form as far as the ocelli, just behind these spots are two oblong dark spots, also placed end to end but more widely separated ; pronotum somewhat suffused with fuscous, with traces of one or more longitudinal lines of the ground-colour ; scutellum with two triangles at the base dark fuscous or black ; elytra with all the areas, except the costal and first sub-apical, more or less margined (sometimes entirely filled up) with dark fuscous or black ; membrane fuscous ; tibiæ spotted with black, posterior pair with a narrow black streak within ; body below chiefly black.

♂. Genital plates (taken together) elongate-triangular, rounded at the apex, about four times as long as the genital valve, with a row of bristles near the outer margins. Side-lobes of hypopygium much narrowed and produced. Lower apical angle of the anal tube produced in a tooth-like manner. Length, 3 lines.

The capture of this Arctic species at Pitlochry by Mr. A. Beaumont is an interesting addition to its geographical range, the latitude of that place (56° 41' N.) being ten degrees further south

* André, in 1880, expresses himself to the same effect as Dr. Kriechbaumer : " La femelle est commune mais le mâle est si rare qu' il n' est même pas très sûr que les individus qu' on lui rapporte en soient d' une façon bien authentique."—Species des Hymen : Tenthr. i 32, January 7th, 1880.—J. A. O.

than any of its hitherto recorded localities. The most northern locality given for it by Dr. J. Sahlberg, *l.c.*, is Lyngen, Finmark (69° 34' N.).

T. stupidula may always be distinguished from *T. subfuscula*, the most nearly allied British species, by its greenish-yellow ground-colour, even when the dark markings on the elytra are obsolete or entirely wanting.

DELTOCEPHALUS PROPINQUUS.

Deltocephalus propinquus, Fieb., Verh. z.-b. Ges., XIX, 204, 5, tab. v, fig. 5.

Allied to *D. punctum*, Flor, in the pointed form of the head. Brownish-yellow; the nerves bounding the base and apex of the first sub-apical area thickened and milk-white. Very variable in the dark markings of the elytra, sometimes these are entirely absent, while in the darkest form all the areas are narrowly margined with fuscous, and many intermediate forms occur. In what appears to be the commonest form the upper margin of the first sub-apical and the hind margins of the apical areas are narrowly bordered with dark fuscous, and the hind margin of the fourth sub-apical area is also bordered with the same colour in such a manner as to nearly resemble the dark spot observable on the elytra of *D. punctum*, Flor.

♂. Genital valve triangular, shining black; plates (taken together) triangular, broadly truncate at the apex, about two and a half times as long as the valve, entirely covering the hypopygium, dark brown with pale yellowish margins. Lower margins of the hypopygium (viewed from below) with a falcate, acute, corneous, dark brown process placed near the middle and directed inwards and backwards. Inner processes (*griffel* of Fieber) deep shining black, about half as long as the plates, somewhat curved, obtuse, and having at their base a straight tooth which is about two-thirds as long as the process itself.

♀. Hind-margin of the last ventral abdominal segment with two small obtuse triangular teeth which are about equidistant from the side-margin of the segment and from each other. Entire segment brownish-yellow with an oblong black patch on the hind-margin, including the teeth, and below each tooth there is almost invariably a black dot, but this latter is evidently caused by the bases of some muscles connected with the ovipositor showing through the pale portion of the segment, since it disappears when the segment is dissected out. Length, 2 lines.

The locality indicated in Dr. Puton's "Catalogue" (1875) for this apparently little-known species is Andalusia. It seems to be tolerably common in Norfolk, and is probably overlooked elsewhere. I have examined 42 examples (24 ♂ 18 ♀).

Swiss Cottage, Rupert Street, Norwich :

December 18th, 1883.

A MEMOIR OF ANT-LIFE BY THE LATE REV. H. S. R. MATTHEWS.

COMMUNICATED BY THE REV. A. MATTHEWS.

Among a host of notes and records of Natural History left by my brother, I lately found the subject of my present communication. And since so much interest has lately been excited by the researches of Sir John Lubbock into the life-history of Ants, I thought that its publication would prove interesting to those Naturalists who have paid so much attention to this subject, and also serve as a corroboration of facts already recorded by others. I have, therefore, transcribed the following memoir entitled in the words of its author:—

[THE WARS OF THE ANTS.

On the 25th of June, 1850, as I was passing through a fir-plantation near Skellingthorp in this county (Lincolnshire), I observed two very large colonies of the great red and black Ant, *Formica rufa*; their nests were about five or six yards apart, and had been built, like others in their vicinity, on the bank of a dry ditch by the side of the road. Their inhabitants were busily engaged in the usual occupations of Ant-life, some carrying home various articles of food, such as small insects or caterpillars, while the greater part seemed to be employed in collecting materials for the purpose of enlarging their already enormous nests. I was much amused by watching their proceedings; one individual was endeavouring with all his might to drag home a long piece of stick, unconscious that all his efforts were rendered abortive by two of his own companions, who, on the other side of an intervening root, were equally determined to drag the same stick in an entirely contrary direction; in another part, one, whose ambition exceeded his strength, seized a tolerably large caterpillar by the throat, and was forthwith hurled ignominiously on his back, nothing daunted by this rebuff he loosed his hold, and patiently watched the contortions of the caterpillar, until, seeing his head and tail in contact, he pounced suddenly upon him, and seizing both extremities in one grip of his powerful jaws he raised his now helpless victim on high, and bore him off in triumph. Feeling much interested in my new friends, and anxious to improve our acquaintance, I took an early opportunity of revisiting the spot. But, alas! in the short space of one week how great a change had come over the scene. The once flourishing colonies, a few days before teeming with life, seemed almost entirely depopulated, scarcely could an Ant be seen on either nest, and the few, whose appearance was the only sign that any of its former multitudes remained, crawled stealthily over the surface, more like robbers or spies than the rightful owners of the soil.

Astonished by what I saw I investigated the matter more closely, and before long discovered the true state of affairs. An internecine war had broken out, which, arising probably in some private quarrel, had eventually involved the whole of the rival communities, and had been carried on with the most rancorous hatred, and the most persevering hostility. The scene of the main conflict lay in the ditch between the two nests; the whole of this space was literally covered with the dead bodies of the combatants, which in some places lay more than an inch deep. The historical hatred of the Kilkenny Cats, which, as we are told, terminated in their total annihilation, was here exhibited in all its intensity. With a few solitary exceptions all, preferring death to defeat, had paid the last debt of nature. Here and there, in various parts of the battle-field, the strife was still carried on by single combat; each antagonist blindly bent upon destruction, endeavouring to seize the other by its antennæ, and when this had been accomplished, locked in each other's embraces, they rolled upon the ground, until the struggle had ended in the death of one or both combatants. A survivor from one of these duels still able to crawl about, and still burning with fury, was searching in every direction for another antagonist; having touched with his antennæ a supposed enemy he halted for an instant, and gathering together all his remaining strength, rushed blindly forward, and frantically seized a small stone.

Pondering much on what I had seen, but too true a picture of the suicidal folly of mankind, I at length pursued my way to a neighbouring village, where I intended to remain for a few days fishing and insect-hunting. Three days after I had witnessed the sad though interesting sight I have described, I passed the same locality on my return homewards, and was pleased to find affairs much improved. All traces of the conflict had been obliterated, and the bodies of the fallen removed. As if by magic a fresh race had sprung up, apparently as numerous as its predecessors. The arts of peace were again flourishing with renewed energy; the nests had been repaired, and set in order; fresh outworks had been constructed, and every thing that industry could accomplish had been done to render the defences complete, and guard against future disasters.

In this state I left them, nor was I able to repeat my visits, but much hope, that profiting by past experience, they would in future prefer the quiet blessings of peace to the miseries of savage warfare.]

Gumley, Market Harborough:

December 24th, 1883.

THE ACULEATE HYMENOPTERA OF THE NEIGHBOURHOOD OF COLCHESTER.

BY W. H. HARWOOD.

Having, during the past two seasons, devoted some attention to the Aculeate *Hymenoptera* of the Colchester district, I send a list of the species I have met with, hoping it may prove as interesting to others, as similar local lists have been to me. I have worked principally at the bees, but have taken representatives of the other families when they came in my way. I ought to mention that I have been largely indebted to Mr. Edward Saunders for his kind assistance in naming my specimens, without which my list would be neither so long, nor so reliable, as it is.

Formica rufa, L., and *fusca*, L.

Lasius fuliginosus, Ltr., and *niger*, L.

Myrmica rubra, L., races, *ruginodis*, Nyl., and *scabrinodis*, Nyl.

Leptothorax tuberum, F., race, *Nylander*, Foerst.—this seems to be a scarce ant generally, but I do not think it is uncommon hereabouts. I found a nest under bark of black poplar at Bures, in Suffolk, on the 12th of last April, and had previously taken it nearer home. As yet I have met with no specimens in the winged state.

Mutilla europæa, L., scarce.—three or four males on the wing, and at bramble and *Angelica* flowers, and one female curled in a curious manner round a young oak-twig, St. Osyth.

Sapyga 5-punctata, F.

Pompilus cinctellus, Spin., and *plumbeus*, F.: *chalybeatus*, Schiödt.—this species was not rare one sunny morning last autumn, on a small sandy hillock among clay cliffs at Walton-on-the-Naze, but was exceedingly active and difficult to capture; *Wesmaeli*, Thoms., and *spissus*, Schiödt.

Priocnemis fuscus, L., *exaltatus*, F., and *hyalinatus*, F.

Ceropales maculatus, F.—*Angelica* flowers, St. Osyth.

Ammophila sabulosa, L., *lutaria*, F.—coast-sands.

Tachytes pectinipes, L.

Passalæcus cornigera, Shuck., and *insignis*, V. d. L.

Pemphredon lugubris, F., *unicolor*, Latr., and *lethifer*, Shuck.

Gorytes mystaceus, L., and *campestris*, L.

Hoplisis bicinctus, Rossi.—of this rare and beautiful species I captured a male in 1882, and a female on August 1st, 1883.

Mellinus arvensis, L.—very abundant at Walton-on-the-Naze, flying about coltsfoot, and resting on the leaves; I have not as yet met with it elsewhere!

Cerceris arenaria, L.—at raspberry flowers, &c.: *5-fasciata*, Rossi—rare: *labiata*, F.—generally distributed, on yarrow-flowers, &c.: *sabulosa*, Panz.—very rare: *ornata*, F.—at thistle and other flowers, varies greatly in size.

Trypoxylon figulus, L., and *clavicerum*, Lep.

Crabro leucostoma, L., *podagricus*, V. d. L., *Wesmaeli*, V. d. L., *signatus*, Panz.

—of this insect, of which only three or four other examples have occurred, I took a fine male in 1882, and a second in 1883, the latter from its burrow in a post: *cephalotes*, Panz., *vagabundus*, Panz., *cribrarius*, L., *vagus*, L., *Kollari*, Dhlb.—of this novelty (see Ent. Mo. Mag., vol. xix, p. 246, April, 1883) I have taken a nice series of both sexes on *Angelica* flowers: *albilabris*, F.—on flowers of *Anthemis cotula*, &c.

Entomognathus brevis, V. d. L.

Oxybelus uniglumis, L.—not uncommon at Dovercourt on yarrow-flowers.

Vespa crabro (not seen during the past two seasons), *vulgaris*, L., *germanica*, F., *rufa*, L., and *sylvestris*, Scop.

Odynerus spinipes, L., *melanocephalus*, Gmel., *callosus*, Thoms. (this was found as early as March 26th, 1883), *parietum*, L., *pictus*, Curt., *trifasciatus*, Oliv., *antilope*, Panz.—not uncommon at raspberry flowers; *parietinus*, L., and *sinuatus*, F.

Colletes succincta, L.—at flowers of *Eryngium maritimum*, common, but local: *Daviesana*, Sm.—common at *Anthemis cotula* and *Tanacetum vulgare* flowers.

Prosopis communis, Nyl., *signata*, Panz., *hyalinata*, Sm., *confusa*, Nyl., *brevicornis*, Nyl., and *pictipes*, Nyl.—this last very local species occurs in my garden, where its habit is to burrow into old posts.

Sphecodes gibbus, L., *pilifrons*, Thoms., and *ephippium*, L.

Halictus rubicundus, Chr., *leucozonius*, Schr., *quadrinotatus*, Kirb., *cylindricus*, F., *albipes*, Kirb., *villosulus*, Kirb., *nitidiusculus*, Kirb., *punctatissimus*, Schk., *tumulorum*, L., *minutissimus*, Kirb., *Smeathmanellus*, Kirb., and *Morio*, F.

Andrena Hattorfiana, F.—two specimens only as yet, on *Scabiosa arvensis* flowers: *cingulata*, F.—apparently rare and local, Nayland; *albicans*, Kirb., and *atriceps*, Kirb., *rosæ*, Panz.—rare, Stanway: *Trimmerana*, Kirb., and *var. spinigera*, *fulva*, Schr., *Clarkella*, Kirb.—Nayland, St. Osyth, and Bentley (Suffolk); a fine variety of the female occurred, with the pubescence on the abdomen entirely fulvous instead of black: *nigro-anea*, Kirb.—common inland, swarming on the coast: *Gwynana*, Kirb., and its autumn brood *bicolor*: *præcox*, Scop.—at willow blossoms, Nayland, &c., also near Sudbury (Suffolk): *varians*, Rossi, *helvola*, L., *fucata*, Sm., rare, St. Osyth, on bramble flowers: *nigriceps*, Kirb.—one specimen near Bentley (Suffolk) on ragwort in 1882, a fine series at Stanway on bramble flowers, July, 1883: *denticulata*, Kirb.—at thistle flowers, rare: *fulvicrus*, Kirb.—rare at present, Nayland: *albicus*, Kirb.—this is one of the bees that burrow in trodden pathways; the males may be seen flying close to the ground, upon which the tiny mounds of earth thrown up by the females may be easily discovered; where these are quite fresh, the proprietor of the establishment may generally be found at home: *chrysoceles*, Kirb., *coitana*, Kirb., *labialis*, Kirb., *minutula*, Kirb., *nana*, Kirb., *dorsata*, Kirb., and *Afzeliella*, Kirb.

Dasypoda hirtipes, Latr.—at hawkweed flowers; rare in 1883, not found previously.

Nomada solidaginis, Panz., *succincta*, Panz., *alternata*, Kirb., *ruficornis*, L.: *borealis*, Zett.—rare, about burrows of *Andrena Clarkella*; Smith gives April 10th as an early date for this species; I took it last year on April 3rd: *Fabriciana*, L., and *furva*, Panz.

Epeolus rufipes, Thoms.—rare, Stanway and Nayland: *productus*, Thoms.

Melecta luctuosa, Scop., and *armata*, Panz.

Cælixys rufescens, Lep., *elongata*, Lep., and *acuminata*, Nyl.

Megachile maritima, Kirb.—Walton-on-the-Naze: *Willughbiella*, Kirb., *circumcincta*, Lep.—Nayland: *lignisea*, Kirb.—at flowers of *Geranium pratense* in my garden; this plant does not occur here in the wild state; also at flowers of everlasting pea, &c.: *centuncularis*, L.—very common in my garden.

Anthidium manicatum, L.—at flowers of *Ballota nigra*, *Geranium pratense*, and raspberry; I have found *G. pratense* a very attractive plant to bees generally, and especially to those belonging to the genera *Cælixys* and *Megachile*.

Stelis aterrima, Panz.

Chelostoma florissomne, L., and *campanularum*, Kirb.

Osmia rufa, L.—common at *Brassica* flowers, also flying on sunny afternoons about the fronts of cottages, to which grape vines, &c., have been nailed: *pilicornis*, Sm.—of this rare species I met with two specimens in 1883: *cærulescens*, L., and *fulviventris*.

Eucera longicornis, L.—very abundant, especially at flowers of *Ajuga reptans*.

Anthophora retusa, L.—Nayland, &c., rare: *pilipes*, Fab.—very abundant about sunny banks in the early spring; the male was out last year on March 4th: *furcata*, Panz.—rare.

Ceratina cyanea, F.—Nayland, rare.

Psithyrus rupestris, F., *vestalis*, Fourc., *Barbutellus*, Kirb., *campestris*, Panz., and *quadricolor*, Lep.—the males of this genus seem much more abundant than the females; a friend of mine last year brought me a “humble bees’ nest,” from which I bred a number of male *rupestris*, but the occupants of the very few female cells all died without emerging.

Bombus cognatus, Steph.—when collecting *Coleoptera* on the St. Osyth coast last year, I unwittingly disturbed a nest of this species, the proprietors of which came buzzing about my head in a very menacing manner, but having a good-sized net with me, I quickly made them all prisoners; they were mostly males, and probably some of them had never flown before; I tried to breed some females, but failed, probably I kept the cells too dry; this is a common species here, especially towards the coast: *muscorum*, L.—excessively variable: *Latreillellus*, Kirb.—not common; in 1882 I only obtained females, but last year I found all the sexes: *hortorum*, L., and var. *Harrisellus*, Kirb., *pratorum*, L., *sylvarum*, L., *lapidarius*, L., *terrestris*, L., and var. *lucorum*, Sm.

Apis mellifica, L.

Colchester: January 9th, 1884.

Captures in North Uist and St. Kilda.—Last June I spent a few days in the island of North Uist, one of the Hebrides, and met with the following species:

LEPIDOPTERA: *Sericoris littoralis*, *Bactra lanceolana*, *Grapholita campoliana*, *Argyrolepis Baumanniana*, *Dicerorampha simpliciana*, *Eupæcilia angustana*, *Simaethis Fabriciana*, *Plutella cruciferarum*, *Gelechia tenebrosella*, *Tinea rusticella*, *Miana fasciuncula*.

NEUROPTERA and ORTHOPTERA: *Asynarchus cænosus*, *Limnophilus extricatus* and *affinis*, *Lestes sponsa*, *Forficula auricularia*.

HYMENOPTERA: *Bombus Smithianus*, *fragrans*, *terrestris*, and *pratorum*, *Odynerus trimarginatus*.

DIPTERA: *Eristalis sepulchralis*, *Thereva plebeia*, *Dolichopus atratus*, *nubilus*, and *punctum*, *Melanostoma mellina*, *Platycheirus manicatus*.

COLEOPTERA: *Helobia brevicollis*, *Calathus fuscus*, *mollis*, and *melanocephalus*, *Amara familiaris*, *Creophilus maxillosus*, var. *ciliaris*, *Philonthus splendens*, *Meligethes æneus*, *Elatер tessellatus*, *Hylastes piniperda*.

At St. Kilda I found: *Crambus culmellus*, *Bactra lanceolana*, *Glyphipteryx Thrasionella*, *Tinodes aureola*, *Polycentropus irroratus*, *Limnophilus auricula*, *Dolichopus atratus* and *nubilus*, *Helobia brevicollis*, and *Abax striola*.—C. W. DALE, Glanvilles Wootton: December 28th, 1883.

New and rare British Diptera—*Chironomus (Thalassomyia) Frauenfeldi*, Schin.—On November 4th, 1868, I captured both sexes of this interesting species in a cave under the fort at Freshwater Gate, in the Isle of Wight. The cave is inaccessible except at low tide, and the gnats sit on the rocks with the spray of the sea dashing over them. Schiner, in his *Fauna Austriaca*, says, that Herr v. Frauenfeld took it at Trieste on the seashore, sitting on rocks, within reach of the spray of the seething waves.

Clunio marinus, Hal.—On April 18th, 1872, I met with this species skimming over pools of water left by the receding tide, amongst the rocks at Hastings.

Tipula arctica, Curt., in Appendix to second voyage of Sir J. Ross. A pair of this northern species was taken by Mr. J. C. Dale on the summit of Skiddaw, July 5th, 1827. It is somewhat allied to *excisa*, which is also found in the north of England.

Diastata nebulosa, Fall.—This pretty species occurs from September to May, but is rare.

Anomoia permunda, Harris.—A single specimen was taken by myself at Glanvilles Wootton on July 18th, 1870. Although well figured by Moses Harris, yet his name has been entirely ignored by foreigners, and that of *antica* substituted.

Anopheles pictus, Linn., *pygmaeus*, Curt. Guide.—Taken at Glanvilles Wootton by Mr. J. C. Dale.

Loxocera nigrifrons, Mg., *hortoniensis*, Curt. Guide.—Taken by Mr. J. C. Dale at Lyndhurst on June 1st, 1831, and July 7th, 1837.

Sciomyza (Colobæa) bifasciella, Fall.—Taken by Mr. J. C. Dale at Coswell Quay, Dorset, on July 11th, 1855.

Oxyphora Westermanni, Meig.—Taken by Mr. J. C. Dale at Charmouth on September 28th, 1837, and in Monks Wood on August 17th, 1837.—ID.: December 28th, 1883.

Carabus glabratus, Payk., was not uncommon at the entrance to the Horses' Glen at the foot of Mangerton, Killarney. It seems like other *Carabi*, though properly speaking carnivorous, to have a liking for honey, for one specimen was busily employed in biting holes in the bases of flowers of the common red heath (*Erica tetralix*) to extract the nectar. Most, indeed, of the flowers of this plant at that spot were thus bitten; but it is possible that other insects had been at work in the same way.—HENRY N. RIDLEY, Natural History Museum, South Kensington: January 8th, 1884.

Pachytylus cinerascens, F., in Kerry.—I captured a specimen of this uncommon grasshopper in a marsh on the side of the road between Glencar and Waterville. I believe it has not been hitherto recorded from Kerry.—ID.

Description of a new species of saw-fly from Greece.—I am indebted to Mr. C. W. Dale for allowing me to describe a new species of *Athalia*, which he captured on the seashore near Athens, and which I propose to call *Athalia maritima*.

♀. Expands nearly half an inch. Black; prothorax, scutellum, sides of abdomen, femora, tibiæ, and base of the first joint of the four front tarsi, and the tips of all the tarsal claws, rufous; antennæ 11-jointed, sub-clavate, black, clothed with short bristles; head and thorax finely punctured, not pubescent; scutellum forming nearly an oblong square; middle of abdomen, above, and ovipositor, black; wings fusco-hyaline. Not closely allied to any known species; it approaches *A. spinarum*, Fab., &c., in its rufous scutellum, and *A. lugens*, Klug, in the colour of its tarsi.—W. F. KIRBY, Zoological Department, British Museum: January 10th, 1884.

Aleurodes immaculata, Heeger.—Mr. Scott recently brought from Devonshire some examples of a white, spotless *Aleurodes*, which he saw in profusion on ivy (*Hedera helix*) at Mount Edgcumbe, in August last. It agrees very well with the description and figure of *A. immaculata* by Heeger ("Sitzungsber. k. Akad. Wissensch.," Jahrg., 1855, xviii, 33, 1856), a species ascribed by him to Stephens, but without reason, for he never published a description of his *A. immaculata*, of which the name only appears in his "Catalogue of British Insects." Frauenfeld and Signoret did not know the species in nature, the latter surmises it may possibly be identical with *A. phillyrææ*, Haliday (Ent. Mag., ii, 119, 1835); if this were established, the latter is the older name. But where, as in the genus *Aleurodes*, many species are extremely difficult to separate by the characters of the adult insect, microscopic examination alone might fail to differentiate thoroughly this species from others with white spotless wings, and it would be necessary to consult the characters afforded by the larvæ and pupæ of the reputed species respectively, for all authors agree in stating that in the earlier stages of life, unmistakable distinctions are apparent, that is, in those species that have been thus observed. Heeger found his species, for several years, abundant on ivy, on a plant of which, taken into his room, he traced the stages of life in his *Aleurodes*. The name of the species, which pending further investigation may be considered distinct, is new to the British list.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: January 14th, 1884.

Eupteryx melissæ, Curtis.—With the foregoing insects Mr. Scott also communicated some specimens of *E. melissæ*, which he found in a garden near Devonport, common on rosemary bushes (*Rosmarinus*), not an unlikely habitat, for the species was originally recorded as having been taken on balm (*Melissa*), and both plants belong to the *Labiata*. The species is well distinguished, as the Rev. T. A. Marshall observes, by the sea-green hue of its elytra, and also by the hinder tarsi of the male being without the black spot characteristic of the ♂ of its close ally, *E. stachydearum*, Hardy.—ID.

Lepidoptera in the Isle of Man in July.—At the end of July last I made a ten days' visit to the Isle of Man, in the hope that in some of the unexplored parts, something fresh might possibly be turned up. I worked hard on the east, south, and west sides of the island, but very little of interest could be found, and although no doubt the season was a bad one there as elsewhere, I was reluctantly forced to the conclusion, that at best the ground would probably be unprofitable to the Lepidopterist. The four local species, *Sesia philanthiformis*, *Dianthæcia capsophila*, *D. cæsia*, and *Polia nigrocincta* can of course always be relied on there at the right time, and I believe would each be found in plenty all along the rocky parts of the coast, and this includes a great proportion of it; but there seems to be little else to tempt one across, now that the red form of *Cirrhædia xerampelina* cannot at all be relied on. *Dianthæcia cæsia* must be on the wing for a long time, as it was still in good condition, and not uncommon at the time of my visit. Other species taken or noticed included *Argynnis Aglaia*, common on the cliffs and on uncultivated ground inland; *Satyrus Semele* and *S. Janira*; *Chortobius pamphilus*, abundant; *Bombyx rubi*, larvæ common; *Metrocampe margaritata*; *Boarmia repandata*, abundant; *Gnophos obscurata*, very dark; *Pseudopteryx cytisaria*, common; *Acidalia scutulata* and *A. bisetata*; *Larentia didymata*, some of the males very dark, and of the females a curious variety; *Emmelesia alchemillata*, common; *E. albulata*, *Eupithecia venosata*, larvæ in *Silene maritima*; *E. subfulvata*; *E. nanata*; *E. absynthiata*, very large; *E. pumilata*; *Melanthia ocellata*, common; *Cidaria fulvata*, common; *Eubolia mensuraria*, and *E. palumbaria*, both plentiful; *Anaitis plagata*, common; *Dianthæcia capsophila*, full-fed larvæ abundant on *Silene maritima*, the imago also on the wing; *Plusia chrysitis*, very common; *Pyrausta ostrinalis*; *Scopula lutealis*, common; *Scoparia ambigua*, common; *Crambus pascuellus*; *C. perlellus*, not uncommon; *C. geniculeus*; *Homæosoma nimbella*; *Tortrix pyrastrana*; *T. rosana*, abundant; *Diptypteryx Holmiana* and *D. Bergmanniana*; *Aspis Udmanniana*, common; *Sciaphila alternana*, *S. perterana* and *S. virgaureana*; *Grapholitha trimaculana*; *Trycheris mediana*; *Xanthosetia hamana*; *Pepilla Curtisella*; *Depressaria liturella*; *D. heracliana*, larvæ very abundant; *Argyresthia nitidella* and *A. albistria*, both common; *Gracilaria Swederella*, abundant among oaks at Ramsey; *Coleophora lizella*, about thyme on the cliffs; *C. Tengstromella*; *Elachista albifrontella*; *Pterophorus pterodactylus*; and *P. microdactylus*, beaten out of *Eupatorium cannabinum*.

Among a number of species given to me unset by Mr. E. Birchall, and taken at different times by the lighthouse keeper on Douglas Head, were *Charæa graminis*; *Agrotis lucerneæ*; *Anchocelis lunosa*; *Dianthæcia cæsia*, evidently a free visitor to the lights; and *Epunda lichenea*, also evidently not uncommon.—GEO. T. PORRITT, Huddersfield: January 4th, 1884.

Obituary.

William Buckler died at his residence, Lumley, Emsworth, Hants, on the 9th of January, of bronchitis (after a very short illness), aged 69.

We make this announcement with unfeigned regret, which we know will be widely felt amongst our readers.

A fuller notice of Mr. Buckler is in preparation for our next Number.

ON SOME GENERA OF THE SUB-FAMILY *ANCHOMENINI* (*PLATYNINI*, HORN) FROM THE HAWAIIAN ISLANDS.

BY D. SHARP, M.B.

The Hawaiian members of this group show a great variety of appearance, and must form several genera, which may be defined as below :—

METROMENUS (n. g.).

This genus comprises the larger number of the Hawaiian species hitherto placed in *Anchomenus*, *Colpodes*, and *Dyscolus*, from which it is distinguished by the total absence of systematic setæ on the pronotum. The elytra are margined at the base, and the scutellum penetrates backwards between the margins, the fourth joint of the tarsi may be either conspicuously bilobed or only slightly emarginate; the mesothoracic epimera are short externally. The rather numerous species agree satisfactorily in these characters, with the exception of *Anchomenus mysticus*, Blackb., which has the scutellum smaller, and scarcely penetrating between the basal margins of the elytra: this species may, perhaps, be entitled to generic isolation, but the material at my disposal does not enable me satisfactorily to examine into this.

COLPODISCUS (n. g.).

Elytra margined at base, scutellum scarcely penetrating between the basal margins; pronotum furnished with a single systematic seta, placed close to the hind angle, mesothoracic epimera considerably prolonged externally; anterior and middle tarsi bilobed, posterior either bilobed (*A. lucipetens*, Blackb.) or slightly emarginate (*Dyscolus tantalus*, Blackb.). The existence of the thoracic seta in conjunction with the scutellar structure, justifies the formation of this genus, though the two species forming it are very discordant in appearance.

BARYPRISTUS (n. g.).

Stature large and robust, the after-body large and heavy; elytra margined at the base, scutellum dividing the margins; pronotum with a single systematic seta placed some little distance in front of the hind margin; mesothoracic epimera much prolonged externally; all the tarsi with the fourth joint emarginate, but not bilobed. The three species of this genus form a sufficiently natural group; one of them, *Anchomenus Sharpi*, Blackb., forms, perhaps, the nearest approach of the Hawaiian *Carabidæ* to the great genera *Anchomenus* and *Colpodes*, from which it differs by the absence of the anterior systematic seta on

the pronotum, by the mesothoracic epimera prolonged externally, and by the condition of the tarsi, which may be considered as intermediate between those of *Anchomenus* and *Colpodes*.

BLACKBURNIA, Sharp.

The curious insect for which I proposed this generic name, is a very distinct genus: there is no pronotal seta; the basal margin of the elytra is very peculiar, being towards the middle sloped backwards, the scutellum is quite small, nearly concealed, and the mesothoracic epimera are a good deal prolonged externally. These characters are supplementary to those I mentioned when describing the genus originally.

DISENOCHUS, Blackb.

This genus was correctly referred by Mr. Blackburn to the *Anchomenini*, and Karsch was in error in treating the species known to him as a *Promecoderus*, which is a genus of *Broscini*. The mistake of the German savant was, however, a pardonable one, as *Disenochus* has much the appearance and characters of the *Broscini*, the mesothorax being pedunculate or sub-pedunculate, and the elytra unmargined at the base, and the scutellum placed entirely on the mesothoracic peduncle. There are two systematic setæ on the pronotum, one in front of the middle and one a little in front of the hind margin; the two orbital setæ occupy the usual positions.

ATRACHYCNEMIS, Blackb.

This represents another most interesting insect, which I have been able to study only by a single example, which was deprived of tarsi, antennæ and palpi on its journey to me. Though located by both Blackburn and Karsch in the *Harpalidæ*, yet its true relationship is, I believe, with the Hawaiian aberrant *Anchomenini*. There are two orbital setæ, the posterior being placed far from the eye, owing to the reduction of the magnitude of this organ. The pronotal setæ I cannot speak of, owing to the condition of my specimen, but probably there is a single one (which, like those of the head, may be *very feeble*) near the hind angle; the elytra, though possessing rather prominent shoulders, are not margined at the base, and the scutellum is placed entirely on the thoracic peduncle; the elytra are remarkably free from sinuation behind, and closely adapted to the hind-body. These characters are (since the importance of the orbital setæ in the classification of the *Carabidæ* has been demonstrated) consistent only with the location of their possessor in the *Anchomenini*, though it must be admitted that the general facies is an approximation (but only an approximation) to that of the *Dapti* group of the sub-family *Harpalini*.

CYCLOTHORAX, Motsch.

This genus is well distinguished from *Olisthopus* by the untruncate apices of the elytra, a character of interest, inasmuch as *Olisthopus* appears to form a transition to the "truncatipenne" series of *Carabidæ*. It is much less easy to point out good characters to distinguish the genus technically from *Anchomenus*, but the insects of these two genera are so distinct in facies and stature, that no doubt good characters will ultimately be found to distinguish them. So far as the Hawaiian fauna is concerned, *Cyclothorax* is distinguished by the presence of two setæ on the thorax, one in front of the middle, the other on the hind angle itself (apparently very slightly attached, and, in dried specimens, most frequently removed); it thus approaches *Disenochus*, from which it is distinguished by the less pedunculate mesothorax, and by the scutellum not being confined to the peduncle, and by the margined base of the elytra.

Those interested in the genera of Hawaiian *Carabidæ* should consult, in addition to the above remarks, some observations by Mr. Blackburn, in Ent. Mo. Mag., xvi, pp. 105—107.

Thornhill, Dumfriesshire :
February 2nd, 1884.

ON THE EUROPEAN SPECIES OF *LEPIDOPTERA* WITH APTEROUS OR SUB-APTEROUS FEMALES.

BY R. C. R. JORDAN, M.D.

Apterous species occur in all Orders of insects, but in *Lepidoptera* wingless examples seem confined to the female sex; none of these are met with in the *Rhopalocera*, the first group are the *Heterogynidæ*, placed in Staudinger's list next to the *Zygænidæ*; there is only one genus in the family, and it contains two species, *Heterogynis penella* and *Heterogynis paradoxa*. These are insects of warmth and summer time, the males dusky, with semi-transparent wings, the females entirely apterous. Nextly in order, follows the remarkable genus *Ocnogyna*, the species of which may be almost defined to be *Spilosomata* with sub-apterous females, they are ten in number, and inhabit Southern Europe, North Africa, and Asia Minor; *Ocnogyna corsica* has almost the colour and appearance of a small tiger-moth.

Hepialus pyrenaicus forms an exceptional instance in the genus to which it belongs, the wings of the female being only rudimentary.

The whole family of the *Psychidæ*, with at least seventy species, all have perfectly apterous females; following these come the

Liparidæ, and amongst them, firstly, the dusky *Penthophora morio*, with its half-winged mate, and then the more brightly coloured *Orgyia*,* two species of which are British; in this genus, as is well known, the females have only the bare rudiments of wings.

Mr. Stainton kindly reminds me of one *Noctua* amongst our European list, with an apterous female, *Ulochlæna hirta*, of which Guenée says, "La femelle a des ailes reduites à de petits moignons très courts, comme celles des *Hyberniciæ*." The female is figured by Millière, in his *Icones* (livr. 6, pl. 4).

In the *Geometridæ* apterous females become comparatively common: thus following the order of Staudinger's list, there is, firstly, the genus *Hibernia* (7 species†), then *Anisopteryx* (2 species), *Phigalia pedaria* (*pilosaria*), *Chondrosoma fiduciaria*, and the first section (including 9 species) of the genus *Biston*, nextly, the last sub-section of the genus *Gnophos*, namely, *Gnophos Zelleraria*, *G. Andereggaria*, *G. cælibaria*, and *G. operaria*, have all sub-apterous females, and so also have two genera allied to *Psodos*, *Pygmæna fusca*, and *Egea pravata*; the two *Cheimatobiæ*, and, to the best of my belief, the rare *Malacodes regelaria*, close the list of *Geometræ*. In this group the reason for the absence of wings is more evident than in former insects, many are winter moths, and this absence may make them less conspicuous, yet it may be fairly doubted if the sharp eye of a titmouse would easily pass over a female *Cheimatobia*, or even a female *Exapate gelatella*; others, as the *Gnophoi* and *Psodoi* are inhabitants of mountain summits, which seems in part to account for it, yet it has happened to me on the same day to find *Pygmæna fusca* on the Riffel, and going higher to meet with the winged *Gnophos dilucidaria* near the top of the Görner-Grât.

Amongst the *Pyralidæ*, *Acentropus niveus* has the female‡ (in part) with rudimentary wings, and it is easy to see that these might much embarrass a moth which lays its eggs under water.

In the *Tortrices*, as usually classified by English authors, there would be no species with apterous or sub-apterous females; but Wocke places *Oxypteron impar* and *Exapate gelatella* next to the genus *Cheimatophila* in this group, separating them, therefore, widely from *Dasystoma* and *Chimabacche*, which are retained in the *Tineidæ*, next to the *Celechidæ*; these, like many of the wingless *Geometræ*, are

* See a highly interesting paper by Mr. Stainton on the graduated helplessness of these "lazy house-wives," published in the *Journal of the Linnean Society, Zoology*, vol. vi, pp. 156—164: "On the abnormal habits of some females of the genus *Orgyia*."

† I believe the ♀ of *Hibernia Aukeraria* is unknown.

‡ See a very interesting account of the habits of this species in Vol. xii, *Ent. Mo. Mag.*, p. 257.

winter insects. The *Talæporidæ* close our short summary ; in these are found the *Solenobiæ*, which, speaking physiologically, are certainly the most interesting of all our *Lepidoptera*.*

A glance at these varied conditions of apterous life in the *Lepidoptera* teaches us how little is yet known of cause and effect in nature, amongst them are some summer moths flying in broad daylight others are night-flying insects of the frost and the winter, there are some living on the mountain tops, others in the warmth and shelter of the woods, in some, as in *Orgyia*, the nearly allied genera have the sexes differing materially from each other in their structure, in others, as in *Biston*, the difference is but small ; one feature only seems common to the whole group, and even here, too positive an assertion must not be made, since *Chimabacche*, at least, has a small sucker ; this common character is that the digestive organs are reduced to a minimum, and the females are, therefore, little else than living ovisacs.

From the wide diffusion of these "ocnai gunaikēs" over distant regions of the world, it may be predicted that they are very ancient types, and though the testimony of the rocks is against me, it may be allowed to indulge in the hypothesis that the archaic form of Lepidopterous life was almost a land *Trichopteron*, and that the cases of these early *Psychidæ* may yet be found in the fossil state.

The following list of apterous *Lepidoptera* belonging to the European fauna may conclude this summary :

HETEROGYNIDÆ.	PHIGALIA	<i>G. calibaria</i>
HETEROGYNIS	CHONDROSOMA	<i>G. operaria</i>
ARCTIADÆ.	BISTON (pars, i. e.)	PYGMÆNA
OCNOGYNA	<i>B. hispidarius</i>	EGEA
HEPIALIDÆ.	<i>B. lanarius</i>	MALACODES
<i>Hepialus pyrenaicus</i>	<i>B. pomonarius</i>	CHEIMATOBIÆ
PSYCHIDÆ.	<i>B. lapponarius</i>	PYRALIDÆ.
LIPARIDÆ.	<i>B. liquidarius†</i>	<i>Acetropus niveus</i>
PENTHOPHORA	<i>B. incisarius</i>	TORTRICIDÆ.
ORGYIA	<i>B. zonarius</i>	OXYPTERON
NOCTUÆ.	<i>B. alpinus</i>	EXAPATE
<i>Ulochlœna hirta</i>	<i>B. græcarius</i>	TINEIDÆ.
GEOMETRÆ.	GNOPHOS (pars, i. e.)	DASYSTOMA
HIBERNIA	<i>G. Zelleraria</i>	CHIMABACCHE
ANISOPTERYX	<i>G. Andereggaria</i>	TALÆPORIDÆ.

105, Harborne Street, Edgbaston :
January 18th, 1884.

* It is strange that no real advance has been made in the life-history of this genus since the publication of Von Siebold's work on true Parthenogenesis, translated by Mr. Dallas in 1857.

† *liquidarius* ♀ unknown.

Entomological Collecting on a voyage in the Pacific (continued from page 96).—

We arrived in Papetoai Bay (Eimeo) on the morning of May 9th, and on the following day we steamed over to Tahiti and anchored in Papiété Harbour. Eight days were spent here, in coaling ship and giving leave to the crew, and I was able to make two excursions to the mountains, besides sundry shorter walks about Papiété. On one occasion, I reached the hill-fort of Fautaua (famous in the history of Tahiti, as the spot where the natives made their last stand against the French in 1845), which is most picturesquely situated at a height of 2500 feet above the sea. Close by is the principal waterfall in the island, a considerable stream falling over a grand precipice of columnar lava 700 feet high, the surrounding scenery being of the most magnificent description. No new butterflies turned up, but both at Eimeo and Tahiti, I got several moths which I had not previously taken. Specimens of *Cherocampa Erotus* and *Sphinx convolvuli*, usually much rubbed, were occasionally brought to me, and the larva of the latter hawk-moth again occurred, on several species of *Convolvulus*. A very delicate-looking green *Cherocampa* larva, found not rarely on the Taro, the "Nono" (*Morinda citrifolia*, a common wild fruit) and especially on the "Apé" (*Arum costatum*, a gigantic species with an esculent root) produced, to my surprise, our rare British *C. Celerio*, and I reared a beautiful series: the oblique stripe on the fore-wings being much more silvery than in any examples I have seen in English collections. The larva of *Macroglossa* sp. also occurred on the "Nono:" it is very similar in appearance to that of our own humming-bird moth. Several *Geometrae*, apparently related to *Boarmia*, &c., occurred sparingly in the forest, and two very interesting moths were obtained in plenty, by beating the foliage of the *Hibiscus tiliaceus*. One (of which I had previously found a single specimen in Nuka Hiva) is a satiny-white insect, in size, make, and general aspect almost a fac-simile of *Liparis salicis*: and not until I had reared it from a long green "half-looper" caterpillar, did I find out that it is really a Quadrifid *Noctua*. The other is a very pretty delicate green moth, reminding one strongly of *Geometra smaragdaria*: this I bred from a curious long thin reddish-green larva, very closely imitating the midrib of the guava leaf on which it feeds. A *Heliothis* (I think *H. assulta*, Gn.) which occurred rarely in weedy places, was somewhat like a pale *H. marginata*: I found the remains of *Ophideres* sp. near the fort of Fautaua, where a brilliant little Pyralid, black, with large fiery-red spots, was common, flying among ferns in the sunshine.

On May 19th we finally left Tahiti, and reached Pitcairn Island early on the morning of June 1st. The aspect of this famous little island (which is only two and a quarter miles long, by less than one mile wide) is extremely picturesque and striking. Steep, rugged hills, covered with forest in most parts, and attaining an elevation of 1000 feet, terminate in an iron-bound coast of black trachytic rock, on which a tremendous surf is always breaking, and, to all appearance, landing in a boat is nowhere possible. The ship was, however, soon boarded by some of the islanders in a fine whale-boat, in which several of the officers, including myself, shortly afterwards went on shore. The boat, managed with wonderful dexterity, was pulled through the furious breakers without shipping a pint of water, and was hauled up on a very small strip of sandy beach, almost the only landing-place in the island. The people welcomed us heartily, and were evidently greatly pleased to see us, the visit of a British man-of-war being one of the principal events in their

secluded life. There are now 103 persons on the island, all, with very few exceptions, descendants of the mutineers of the "Bounty:" they live in a neat little village of about twenty houses, with a small church and school-house, very prettily situated on a wooded bluff about 300 feet above the sea. Nearly all tropical, and many European fruits thrive here to perfection, and a good deal of arrowroot and sweet potatoes is grown: the native vegetation is very luxuriant, much resembling, in general character, that of Tahiti. No butterfly is apparently found on the island, and I saw only a few common Tahitian moths: but I found, for the first time, the large yellow-striped green larva of *Chærocampa Erotus* on the "Nono" plant, and a good many living pupæ of *Sphinx convolvuli* (equal in size to English specimens) were brought to me, having been found in the patches of sweet potatoes, of which a supply was then being dug up for the ship. Four species of *Coleoptera* (a *Tomicus*? two Cossonid weevils, and a Rhizophagoid?) occurred rarely, and I got a number of a pretty land-shell (*Helix* sp.) on the foliage of the screw-pine (*Pandanus*), and *Dracæna terminalis*.

We remained off the island under steam until the afternoon of the 2nd, and having supplied the inhabitants with some clothing materials, soap, &c., and received in return a good quantity of coco-nuts, oranges, and sweet potatoes, with a few goats and pigs, we took our departure for the coast of Chile. On the following day, at noon, we were close to the uninhabited Elizabeth or Henderson Island, round which we steamed, firing guns at intervals to attract the attention of any people unfortunate enough to be shipwrecked thereon, but we met with no response. This island is a most singular formation, being an ancient coral reef upheaved to a height of about 80 feet: the shores in most parts consist of perpendicular or even overhanging cliffs, honeycombed by the surf into innumerable holes and caverns. There are one or two sandy beaches, on which landing appears to be practicable, but no attempt was made to do so: the top of the island is level, and covered with dense low bushes and small trees, among which we could only recognise the *Pandanus*.

After leaving Pitcairn Island, the weather was fine and warm for about a week, after which we encountered such a series of fierce north-easterly gales, alternating with brief intervals of calm weather, with a most uncomfortable amount of swell, that we were all very glad to make the coast of Chile on the morning of June 30th, and to find ourselves safely at anchor in Coquimbo Bay on the same evening.

The "Kingfisher" remained at Coquimbo, almost without intermission, from June 30th until October 18th. During July and August (winter months) the weather was nearly always dull, cloudy, and hazy, often very cool, and with only an occasional fine day; and insects were exceedingly scarce. The country was, however, more verdant and attractive in appearance than I had ever seen it before, and wild flowers were exceedingly abundant and beautiful—wide stretches of what at other times of the year are nothing but bare loose sand, being completely carpeted for a few weeks only, with handsome *Liliaceæ*, &c. Almost the only butterfly to be seen was *Papilio Archidamas*, which was as usual common, and the specimens exceedingly fine and fresh, the dull weather preventing it from flying much. There appears to be a succession of broods of this beautiful insect throughout the year, and larvæ, pupæ, and imagos may be found together at almost any time. Stray worn specimens of *Pyrameis Carye*, *Terias chilensis*, and *Pieris*

Blanchardi and *Autodice*, occasionally were met with. At the end of August, the fields suddenly became alive with the beautiful little *Colias minuscula*, Butler, both sexes being equally plentiful, and I secured a lovely series. *Argynnis Cytheris*, Drury (previously taken by me at Sandy Point in the Straits of Magellan, and sparingly at Valparaiso) became common a few days later, in rocky places at the foot of the hills, and with it two or three species of "Skippers," of which *Pamphila fasciolata*, Blanch., was at once the prettiest and the most abundant; also two fine *Satyridae* in October.

Several Bombycees also turned up in the larva state, the most remarkable of these being *Ormiscodes crinita*, Blanchard. The larva of this moth—a large, heavy-bodied insect, bearing a superficial resemblance to the ♀ of *Endromis versicolor*—was exceedingly plentiful on the so-called "pepper-tree" (*Schinus molle*), and, even more so on that abundant weed the "Quilo" (*Muhlenbeckia injucunda*). It looks somewhat like an exaggerated *Tanessa* larva, being, when full-grown, nearly four inches in length, of a general dark brown colour, with the incisions between the segments dull orange, and each segment bearing six long branched spines. The slender tips of these, as well as the short whitish hairs with which the body is clothed, sting, when touched, more severely than a nettle, and I have suffered a good deal through incautiously handling these well-protected caterpillars. The larvæ of many other Chilean Bombycees appear to possess this property of urtication, in a greater or less degree. From a green larva, found commonly feeding on *Aristolochia chilensis* and other plants, and very closely resembling that of our *P. gamma*, I reared a very fine series of a handsome *Plusia* not unlike that species in general aspect and markings, but varying in ground-colour from silvery-grey like *interrogationis*, to golden-brown almost as rich as *bractea*. *Heliothis armiger* was very common flying by day in rocky places, and several species of *Agrotis*, *A. saucia* among them, were to be found with their larvæ—not to mention plenty of scorpions—by turning over stones. The pretty yellow-flowered Leguminous shrub, known in Chil  as the "Flor del Mayo" (*Cassia Candolleana*) was, in many places completely stripped of its leaves by the handsome "half-looper" larva of *Alamis polioides*, Guen e (a rather large, obscure-looking grey-brown quadrid *Noctua*), the pupa of which, enclosed in a slight cocoon and covered with a white mealy powder, was often to be found attached to the under-side of stones in the neighbourhood of the plant. A good many *Geometra* (among them one or two handsome *Ennomida*, a very fine *Lobophora*?, &c.) were obtained, the majority of them at rest on Cactus stems, securely hidden among the formidable spines, whence they could only be dislodged by punching the plants with the point of a thick stick. This method of collecting yielded, in addition, a considerable variety of *Tortrices* and *Tinea*, several species of *Pterophori*, &c.

Colcoptera were not at first very plentiful, but directly the warm weather set in at the end of September, enormous numbers of two species of large, white-striped, black Heteromorous beetles (*Nyctelia Luczoti*, I think, being the more plentiful of the two) made their appearance. In some hot, sandy places, these creatures might have been collected literally by bushels. Several other less conspicuous species of this group were almost equally plentiful, and a good sized black *Calosoma* was not rare on the wing, and crawling on the sand in a railway cutting. A handsome bronzy *Buprestis* occurred occasionally on a fine-leaved Leguminous shrub, and the flowers of the Cacti harboured several small hairy beetles allied to *Dasytes*, &c., in great numbers.

The ship left Coquimbo on September 28th, arriving at Valparaiso on the evening of the following day, and remained there until October 8th. The weather throughout our stay was fine (though there had been torrents of rain just before our arrival), and I enjoyed several very pleasant rambles over the steep, bush-covered hills on the lower slopes of which the town is partly built. These hills attain an elevation of 1200 to 1500 feet, and on them I found insects in greater plenty, or at any rate in greater variety, than at Coquimbo. Here I took the recently described and very pretty *Satyridae*, *Neosatyrus violaceus* and *ochreivittatus*, Butler, not uncommonly among the tall "Coligné" or arborescent grass, over which the little blackish-brown *N. ambiorix*, Wallgr., was often to be seen flitting quietly, making me think of our *Erebia Epiphron*. *Geometrae* were fairly well represented, especially in the deep "quebradas" or ravines, where the vegetation is much more luxuriant than on the open hill-sides, and I obtained a good many species new to me. I had a day at El Salto, some eight miles by rail from Valparaiso, and was much pleased to add to my collection, among other things, the large and delicate cream-coloured Pierid, *Heliochroma leucothea*, Gay, which was apparently just coming out of pupa, and not rare, though very difficult to catch.

On October 18th we again left Coquimbo, this time for our old location at Callao, where we arrived on the 25th. During the remainder of this month, and throughout November, insects were very scarce, and, indeed, are not much more plentiful now; in marked contrast to the swarms of such common butterflies as *Agraulis vanillæ*, *Pieris* sp., *Danais Archippus*, *Junonia Lavinia*, *Anartia jatropha*, &c., which enliven the damp meadows and lucerne fields from February to June. Almost the only insect worthy of mention I have obtained is *Papilio Paon*, of which a few larvæ have again turned up. Here I may correct a mistake I have made as to the food-plant of this fine species (Ent. Mo. Mag., Vol. xix, p. 53), which is not, as there stated, the common parsnip, but an allied plant, *Arracacha esculenta*, a native of the higher regions of the Andes, and grown in small quantities about Lima and Callao. It closely resembles parsnip in the general aspect and properties of its foliage, but the root is altogether larger and more tuberous in growth. Larvæ of two or three species of *Halesidota* (a genus allied to *Arctia*, &c.) are not uncommon on various plants, one being remarkable for its dense clothing of pure white hair, which assumes a delicate canary-yellow tint just before the larva spins up. The resulting moth is a very pretty little pale ochreous species, with darker pencillings. The Indian corn is here very subject to the attacks of the larva of a dull-looking species of *Agrotis*?, which eats out the soft central shoot of nearly every young plant, and causes great damage to the crop. A few *Geometrae*, and many species of small *Pyrales*, are to be obtained by beating: but with the exception of the large horned *Golofa*, which flies at dusk over the tops of the low willow trees on the plain, scarcely a beetle is to be obtained at Callao, at this time of the year.—J. J. WALKER, H.M.S. "Kingfisher."

Agathidium rhinoceros near *Colinton*.—In November I had the good fortune to take, near Colinton, a few specimens of *Agathidium rhinoceros*, Sharp. It is a very local species. I only took it on a patch about twenty yards square. I searched the whole wood carefully, and only found it on the one spot.—ALFRED BEAUMONT, Low Valleyfield House, Culross: January 25th, 1884.

Coccinella labilis in the Hastings district.—I am pleased to record this species from this locality. On May 15th last year I saw a good many of what I took to be at the time large-spotted 7-punctata, so only saved a single specimen, which has turned out to be the above species. The locality was the Wood at Guestling, where I worked the nests of *Formica rufa*.—E. P. COLLETT, 76, Islip Street, Kentish Town: February 18th, 1884.

Observations on Lepidoptera at Cambridge.—LEPIDOPTERA—NOCTURNI: insects of this group (and it may be said of all others too), were much less abundant last year than usual. I usually find the *Sphingidæ* tolerably plentiful, but in 1883 *Smerinthus ocellatus*, *S. populi*, *S. tiliæ*, *Acherontia Atropos*, *Sphinx convolvuli*, *S. ligustri*, *Chærocampa elpenor* and *C. porcellus* occurred but sparingly. *Macroglossa stellatarum*, *M. bombyliiformis*, and *Sesia tipuliformis*, were, as far as my observation went, very scanty in numbers; whilst *Sesia formicæformis*, *S. bembeciformis* and *S. apiformis* I did not meet with at all.

Cossus ligniperda larvæ were plentiful in 1881 and 1882, and I reared several by putting them under an aquarium-vase together with pieces of willow bark and chips of wood, and tying the glass firmly down to a piece of slate. They spun cocoons at the end of the autumn, and remained in them during the winter. One or two obligingly spun up close to the glass, so I was enabled to observe them, and noticed that they were still in the larval state. They came out of their cocoons as spring approached, and crawled about the vase for a few weeks and, I presume, resumed feeding. They then one by one, either went back into their old cocoons, which they strengthened with tiny chips of wood interwoven into the substance of the exterior, or they constructed fresh and stronger ones; I am not quite sure which, as I disarranged them a good deal by putting in fresh willow bark, but I am of opinion they constructed new cocoons, and in these they underwent their pupal changes—the imagos coming out in June.

Zeuzera æsculi: I also met with several larvæ of the wood-leopard the year before last, but failed, unfortunately, to rear any of them.

Of the rest of the *Nocturni* I have little to say, I can merely enumerate such species as are generally distributed and common everywhere, with the remark that each and all were less abundant than usual last year.

GEOMETRINA: the *Geometrina* were, as regards some species, fairly plentiful, *Abraxas grossulariata*, for instance, was in great numbers even for that, often too, common moth. The principal species I have seen here are, in addition to commoner ones, *Selenia illunaria*, *Crocallis elingvaria*, *Phigalia pilosaria*, *Amphydasis betularia*, *Hemerophila abruptaria* and *Hypsipetes clutata*.

NOCTUINA—*Acronycta aceris*, I always find in some abundance in the neighbourhood of Downing College, although, strange to say, I never see it in any other part of the town, but it was much less common last year, as far as my observation went, and the same may be said of *A. ligustri* and *A. rumicis*. 1881 was a grand year for the latter species, I have never seen it so plentiful. The only other *Noctuæ* I particularly noticed last year were *Miana furuncula*, *Caradrina blanda*, *Agrotis puta*, *Noctua C-nigrum* (pretty plentiful in September) and *Plusia chrysitis*.

Of the remaining groups I have nothing noteworthy to record, and, all things together, 1883 was a very unsatisfactory year to me. I hope I may do better this.—ALBERT H. WATERS, Mill Road, Cambridge: February, 1884.

Rare Lepidoptera in Pembrokeshire.—One evening in July, 1881, I thrice saw *Triphæna subseua* at sugar. The first appearance was a sight and nothing more; the second gave me time to attempt a capture—and fail; the third resulted fatally for the insect, but gave me a splendid example for my cabinet. In the same locality were taken at sugar *Agrotis agathina*, *Aplecta advena*, *Cryptoblabes bistriga*, *Rhodophaea tumidella*; and, as previously recorded, a single specimen of *Polia nigrocincta*. *Agrotis lucerneæ* appeared not infrequently flying in its usual reckless manner over and under some very rough shingle below high water-mark. *Minoa euphorbiata* was taken rarely in the woods, and one specimen of *Emmelesia unifasciata* appeared at light. A worn ♀ *Anticlea rubidata* gave me a few eggs which resulted in fine varieties of the perfect insect, the ground-colour being darker than the ordinary type, and of a rich olive hue, such as we get in Pembrokeshire specimens of *Triphæna fimbria*.—GEORGE J. HEARDER, Job's Well, Carmarthen: February 8th, 1884.

Sphinx convolvuli at Carmarthen.—One evening at dusk last September, one of my boys noticed a large noisy moth hovering over a bed of Petunias. He procured a net from the house and captured it, but it escaped immediately, only, however, to return boldly to the flower-bed to be once more captured, and this time properly secured; it proved to be a worn specimen of *Sphinx convolvuli*.—ID.

Emergence of both parasite and moth from the same larva.—A larva of *Dicranura furcula* when being full fed, showed symptoms of serious internal disease, which was not relieved by the appearance of the pupa case of an ichneumon projecting through the skin of the larva. The projecting portion of the pupa-case was crushed between forcep blades, and thus allowed to remain *in situ*. The larva afterwards made a well formed cocoon, from which, in due time, emerged an imago, with the left hind-wing somewhat crippled, but otherwise a perfect insect.—ID.

Is Hesperia Actæon double brooded?—A visit to Lulworth Cove during the first week in July, produced this butterfly in fair numbers. They had then evidently been out for some time, so the larger number of specimens taken were in a very dilapidated condition, and no fresh specimen was seen.—ID.

Botys urticata in February: a problem for solution.—This evening my attention was called to a "large" moth (in contradistinction to a "clothes moth") said to be flying about the kitchen. Not unnaturally I expected to see one of the *Hybernæ*; or a precocious *Tæniocampa*; or possibly one of the hibernating species roused into activity by the heat of the kitchen fire, and the spring-like weather recently experienced. My astonishment was very great when I saw a *Botys urticata* evidently recently emerged ("scarcely dry") and in good condition. The larva of this insect is supposed to hibernate. Why, therefore, this abnormal appearance of the imago, and under such conditions? But, putting aside the origin of the larva that produced this moth—why did the latter appear this evening? Was it a specimen that should have developed last summer; or was it the result of a "second brood" larva? There are some of the ordinary dried (now very much dried) culinary herbs in the kitchen, but they could hardly be suspected of harbouring *Botys urticata* in any shape.—R. McLACHLAN, Lewisham: February 15th, 1884.

Bigamy in Platypteryx hamula.—On the 28th of August, 1883, I bred a male and a female imago, who paired the same evening. On the 29th of the same month a fresh female had emerged. Finding that the pair of the 28th had separated, on the evening of the 30th I placed the male of the 28th with the virgin female of the 29th. These paired within two hours; and, on the 31st of August and 1st of September, both females deposited their ova on the sides of their muslin cages. After a lapse of fifteen days both broods hatched off satisfactorily, the *second brood* about three or four hours earlier than the first brood. I carefully marked both bags containing the ova for the purpose of observation and identification.—HAROLD ARCHER, The Close, Ely: *January, 1884*.

Description of the larva of Pterophorus zophodactylus, Dup., = Loewii, Zell.—In the middle of August last Mr. Thomas Parmiter, of Cattistock, Dorchester, kindly sent me a nice supply of full-grown larvæ and pupæ of this species. The larva is slightly less than half an inch in length, and of proportionate bulk; head much smaller than the second segment, the lobes rounded and polished; body cylindrical and uniform, tapering a little posteriorly; segmental divisions fairly defined, and a tuft of several short hairs springs from each of the indistinct tubercles. In colour there are two extreme varieties, and the larva varies between these forms. Var. 1 has the ground colour a delicate pale green, strongly tinged indeed with yellow; head pale yellowish-green, the mandibles and ocelli brown; medio-dorsal stripe dark green or purple in different specimens; sub-dorsal stripes yellow, and there are two other fine but very faint yellow lines, one above and the other below the spiracles; segmental divisions also yellow; spiracles black, very narrowly encircled with white. Ventral surface, legs and prolegs uniformly pale yellowish-green.

Var. 2 has the ground-colour brownish-yellow; head also brownish-yellow, freckled with brown; medio-dorsal stripe broad bright purple; sub-dorsal stripes also broad, but of a much less distinct dull pale purple, and having a fine white line running through them; a narrow purple line, edged above with white, extends along the spiracular region. Ventral surface, legs and prolegs uniformly pale yellowish-brown. Feeds on the flowers of *Erythræa centaurea*.

The pupa is slender, and nearly (if not quite) as long as the full-grown larva; it is of almost uniform width, the last two segments only tapering to the anal point. It is glossy and cylindrical, but there is a depression on the thorax and front abdominal segments; the snout and top of the thorax are prominently and sharply defined; the leg-cases extend a long distance down the front of the abdomen, but before the end, become detached from it. The ground-colour is yellow, but is almost hid with a deep pink, which is suffused all over the surface, and almost forms a stripe from the head through the abdominal segments; wing- and leg-cases dingy olive, tinged with pink. All the imagos (a fine series) emerged from August 23rd to September 1st.—GEO. T. PORRITT, Huddersfield: *February 5th, 1884*.

Zaræa fasciata (♂), and its parasite, *Mesoleius sepulchralis*.—I have a ♂ of this saw-fly, bred by Mr. F. Norgate, from a larva taken in the New Forest in 1879. The ichneumons bred by Dr. Osborne from *Zaræa* are *Mesoleius sepulchralis*, Holm., new to Britain; I believe the ♂ is undescribed; it differs from the ♀ in having the face, front and middle coxæ, and trochanters, tibiæ and tarsi, and basal ring of hind tibiæ, white, in other respects the sexes are very much alike.—JOHN B. BRIDGMAN, Norwich: *February 16th, 1884*.

Halictus breviceps, E. Saund., and *H. brevicornis*, Schenck.—In my Synopsis of British *Hymenoptera* (Trans. Ent. Soc. Lond., 1882, pp. 218 and 221) I described two species of *Halictus* under the names *brevicornis*, Schenck, and *breviceps*, E. Saund. I regret that I must now withdraw the *brevicornis* of my Synopsis from our list, as its exponents are, I believe, referable to the ♂ of *breviceps*, E. S., and not to the true *brevicornis*, Schenck.

When I described *brevicornis* I had only seen two ♂ specimens from the country, and on comparing them with a ♂ *brevicornis* received from C. Ritsema, I was satisfied of their identity. I therefore described the species as British, characterizing the ♀ from a Dutch specimen.

Whilst at Hayling Island in August last year, I took the ♂ of what I had called *brevicornis* pretty freely on thistle-heads, and the ♀ of my *breviceps* on *Crepis* flowers near the same spot, and I searched in vain day after day for ♀ *brevicornis* and ♂ *breviceps*, till it began to dawn upon me that the males and females that I had been taking must be sexes of the same species; accordingly, on my return home, I very carefully examined my males a second time with Ritsema's *brevicornis*, and, although the two species are even more alike than usual in this genus, I can see that they are really distinct. The face of *breviceps* ♂ is slightly longer than that of our species, and the clypeus rather narrower; the joints of the antennæ towards the apex are slightly longer than broad, instead of being slightly broader than long; the mesothorax is less remotely punctured, and the genital armature has the sagittæ less raised, and the basal portion or "cardo" smaller. Still the two males are very closely allied, and in general aspect are almost indistinguishable; the females of the two species are at once separable by the shape of the face and the very different puncturation of the mesothorax. I have sent specimens to C. Ritsema, and although the species was unknown to him, he thought the ♂ and ♀ sent were probably referable to one species. The synonymy will now stand as given in my Catalogue—*breviceps*, E. Saund., = *brevicornis*, E. S., ♂, *nec* Schenck.—EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: Feb. 12th, 1884.

Obituary.

William Buckler, who, as already announced, died on the 9th January of bronchitis, was born 13th September, 1814, at Newport, in the Isle of Wight, and received his early education in his native town; when quite young, he showed great aptitude and taste for drawing; this was recognised by Captain (afterwards Admiral) Ffarrington, of Woodvale, near Cowes, through whose influence he was introduced to the studio of Mr. Sass, Soho, whence, after having completed his course in a highly creditable manner, he became a student of the Royal Academy, and distinguished himself in the Antique School, and in drawing from life. Though a painter in oils, he turned his attention mainly to water-colours, in which he was a successful portrait painter, and from 1836-56, he was fully engaged by numerous and influential patrons; during these years he exhibited *sixty-two* subjects at the Royal Academy—his pictures were always highly finished and pleasing. In 1857 he wrote: "this being the first year I have omitted sending anything."

He lived for some years at 32, Orelard Street, Portman Square, London, but about 1848 he settled at Emsworth in the South of Hampshire, and after a time began to "turn his attention to Entomology, as an amusement for his leisure

hours." His first appearance in print as an Entomological writer is a short notice of "Captures of *Lepidoptera*" in the Entomologist's Weekly Intelligencer, for June 14th, 1856 (Vol. I, p. 83), this was followed on the 26th July (p. 132) by a notice of the capture of *Colias Hyale* by a friend. Then came a notice in the Substitute, for January 3rd, 1857 (p. 132) on the duration of the pupa state of *Acherontia Atropos*, and in the Intelligencer (Vol. II, p. 4) of a male *Phigalia pilosaria* being attracted to the outside of a breeding-cage by the presence within of a female, which had lately emerged from the pupa state.

But in the summer of 1857 an event occurred, which was destined to bring Mr. Buckler more prominently forward, and which enlisted his artistic talent in the cause of Entomology. This event was the abrupt discontinuance of that line of work by the artist, who had for more than two years been employed to figure the larvæ of the *Tineina*. It was absolutely necessary to find a fresh artist with as little delay as possible, and a forcible appeal appeared in the Intelligencer (Vol. II, p. 113) entitled, "Portrait-painting."

The result was that Mr. Buckler offered his services as delineator of these Micro-larvæ and their mines and food-plants, and the exquisite finish of his drawings is well known to all who have seen the originals, though it is to be feared that the published figures of his larvæ, such for instance as those of *Exaretia Allisella* and *Psecadia funerella* in the thirteenth volume of the Natural History of the *Tineina*, scarcely give an idea of the beautifully soft appearance of the actual drawings.

For nearly three years Mr. Buckler was engaged in this work, and had made about 120 figures, but, owing to the fact, that a full-grown larva just arrived from the Continent, cannot wait, but must be figured *at once* when it reaches the artist, the nature of the employment was found to tie him so very closely, and to interfere so seriously with his time in preventing him from keeping engagements with his friends, that in June, 1860, he begged, though with some regret, that some other artist might be found for the task, most courteously, however, offering to continue his services till the needful artistic aid had been obtained.

The (short-lived) Weekly Entomologist, which began to appear in August, 1862, nearly 12 months after the decease of the Entomologist's Weekly Intelligencer, contains (Vol. I, p. 45) the description of the larva of *Pamphila sylvanus*; in the same work (Vol. III, p. 213) appears a description of the larva of *Eupheria fulvago*. These have a special interest as being the first two descriptions of Macro-larvæ from the pen of William Buckler—to be followed by the long series which have enriched the pages of this Magazine.

Descriptions of the following larvæ by William Buckler have appeared in the Entomologist's Monthly Magazine:—

In Vol. I.—*Leucania littoralis* (p. 48), *Lithosia pygmæola*, *caniola*, *complanula*, *complanata*, *stramineola* and *rubricollis* (pp. 48, 49), *Xylophasia scolopacina* (p. 50), *Leucania comma* (p. 140).

„ II.—*Hadena rectilinea* (p. 20), *Cænonympha Davus* (p. 65), *Toxocampa cracca* (p. 67), *Leucania putrescens* (p. 94), *Agrotis ravida* (p. 115), *Agrotis aquilina* (p. 133), *Agrotis nigricans* (p. 162), *Hipparchia Semele* (p. 188), *Acidalia manciunata* (p. 189).

„ III.—*Leucania pallens* (p. 68), *Hadena suasa* and *Hepialus sylvinus* (p. 136), *Leucania conigera* (p. 137), *Agrotis lunigera* (p. 188), *Cucullia umbratica* (p. 208), *Acronycta auricoma* (p. 261), *Catocala sponsa* (p. 276).

- In Vol. IV.—*Sesia chrysidiformis* and *Aplecta advena* (p. 14), *Limenitis Sibylla* (p. 33) (see also V., p. 226), *Hadena genistæ* (p. 61), *H. adusta* (p. 62), *H. thalassina* (p. 63), *Tanagra chærophyllata* and *Apatura Iris* (p. 85), (for the latter see also XIII, p. 3), *Epunda nigra* (p. 87), *Cucullia scrophulariæ* and *verbasci* (p. 116), *Colias Edusa* (p. 117), (see also Egg-laying of *C. Edusa*, XIV, pp. 40 and 89), *Cirrædia xerampelina* (p. 136), *Miana furuncula* (p. 137), *Argynnis Aglaia* (p. 155), *Xanthia gilvago* (p. 156), *Xanthia ferruginea* (p. 180), *Agrotis puta* (p. 199), *Dasytopia templi* (p. 251), *Zygæna loniceræ* (p. 253).
- „ V.—*Acontia luctuosa* (p. 75), *Argynnis Euphrosyne* (p. 125), *Lycæna Artaxerxes* (p. 176), (see also *L. Medon* (*Agestis*) XV, p. 241), *Hepialus hectus* (p. 177), *Heliophobus popularis*, *Charæas graminis* and *Luperina cespitis* (p. 225), *Limenitis Sibylla* (the young larva p. 226), *Lycæna Ægon* (p. 241), *Vanessa cardui* (curious variety of the larva, p. 278).
- „ VI.—*Aporophila australis* (p. 13), *Thecla rubi* (p. 38), *Plusia interrogationis* (p. 65), *Lycæna Arion* (the eggs of, p. 91), *Sesia ichneumoniformis* (p. 90), *Pyrallis glaucinalis* (p. 111), *Nephopteryx angustella* (p. 143), *Hydræcia micacea* (p. 164), *Chilo phragmitellus* (p. 188), *Thanaos Tages* (p. 233), *Epunda lutulenta* (p. 235), *Noctua Dahlii* (p. 261), *Xanthia cerago* and *silago* (p. 262).
- „ VII.—*Scoparia muralis* (p. 13), *Pempelia formosa* (p. 14), *Hypsipetes impluviata* (p. 42), *Erebia Medea* (*Blandina*) (p. 64), *Acronycta myricæ* (p. 83), *Hepialus velleda* (p. 84), *Argynnis Selene* (p. 114), *Deilephila galii* (pp. 123 and 232), *Homæosoma senecionis* (quoted in an article by Mr. Howard Vaughan, p. 131), *Crambus fascinelinus* (*Pedriolellus*) (p. 160), *Ptilophora plumigera* (p. 210), *Miana arcuosa* and *Chesias spartiata* and *obliquaria* (p. 260).
- „ VIII.—*Eremobia ochroleuca* (p. 21), *Acidalia trigeminata* (p. 22), *Tapinostola elymi* (p. 68), *Agrotis corticea* (p. 89), *Xylina furcifera* (*conformis*) (p. 114), *Noctua umbrosa* (p. 139), *Pterophorus isodactylus*, *teucii*, *plagiodactylus* and *Lienigianus* (pp. 153—158), *Gymnancyla canella* (p. 163), *Nudaria senex* and *mundana*, *Setina irrorella*, *Lithosia mesomella*, *muscerda* and *complanata* (pp. 169—175), *Apamea unanimis* (p. 207), *Leucania straminea* (p. 248), *Melitæa Athalia* (p. 258).
- „ IX.—*Agrotis cursoria* (p. 14), *Nola strigula* (p. 15), *Anchocelis litura* (p. 39), *Brephos notha* (p. 41), *Triphæna subsequa* (p. 56), *Dianthæcia cæsia* (p. 64), *Acidalia degeneraria* (p. 115), *Ephestia artemisiella* (p. 143), *Celæna Haworthii* (p. 195), *Acidalia incanaria* (p. 246), *Sphinx convolvuli* (p. 286), *Polia chi* (p. 290).
- „ X.—*Aventia flexula* (p. 42), *Limacodes asellus* (p. 70), *Hesperia Actæon* (p. 86), *Phycis* (?) *Davisellus* (*Nephopteryx genistella*, Dup.) (p. 89), *Hermينيا barbalis*, *tarsipennalis*, *derivalis* and *cribralis* (pp. 100—104), *Crambus pinetellus* (p. 162), *Mimæseoptilus aridus* (p. 182), *Ephestia elutella* (p. 213), *Rhodophæa marmorea* (p. 214), *Lithosia quadra* (p. 217), *Nonagria geminipuncta* (p. 230), *Caradrina Morpheus* (p. 254), *Apamea gemina* and *Nonagria neurica* (p. 275).

- In Vol. XI.—*Dianthæcia albimacula* (p. 16), *Deilephila euphorbiæ* (p. 73), *Anerastia lotella* (p. 186), [How to rear *Bombyx rubi* from the larva (p. 188)], *Xylophasia lithoxylea* and *polyodon* (p. 208), *Heliothis dipsacea* (p. 256).
- „ XII.—*Rhodophaa suavella* (p. 13), *Aplecta occulta* (p. 66), *Cleora glabraria* (p. 84), *Cataclysta lemnalis* (p. 102), *Xylina rhizolitha* (p. 140), *Paraponyx stratiotalis* (p. 160), *Hydrocampa nymphæalis* (p. 210 and XVII, p. 249), *Pterophorus dichrodactylus* (p. 233), *P. microdactylus* (p. 234), *Botys lancealis* (p. 277).
- „ XIII.—*Apatura Iris* (p. 3), *Crambus tristellus* (p. 14), *Lycæna argiolus* (pp. 29, 62 and 138), *Miana fasciuncula* (p. 62), *Cymatophora ocularis* (p. 90), *Herminia grisealis* (p. 110), *Cryptoblabes bistriga* (p. 111), *Ebulea stachydalis* and *sambucalis* (p. 133), *Lobophora viretata* (p. 185), *Catocala promissa* (p. 233).
- „ XIV.—*Drepana sicula* (p. 1 and XVII, p. 122), *Earias chlorana* (p. 42), [Egg-laying of *Colias Edusa* (pp. 40 and 89)], *Boarmia cinctaria* (p. 83), *Hydrocampa stagnalis* (p. 97), *Manestra furva* (p. 182), *Scopula ferrugalis* (p. 200), *Boarmia abietaria* (p. 219), *Argynnis Paphia* (p. 252).
- „ XV.—*Xylomyges conspicillaris* (p. 17), *Crambus contaminellus* (p. 38), *Cidaria reticulata* (p. 61), *Ebulea verbascalis* (p. 102), *Myelois pinguis* (p. 162), *Crambus geniculeus* (p. 206), *Lycæna Medon* (*Agestis*) (p. 241).
- „ XVI.—*Manestra abjecta* (pp. 19 and 93), *Crambus selasellus* (p. 41), *Dianthæcia Barretti* (*Luperina luteago*) (p. 52), *Nonagria sparganii* (p. 99), *Emmelesia affinitata* (p. 102), *Botys fuscalis* (p. 161), *Pempelia carnella* (p. 167), *Scopula prunalis* (p. 209), *S. olivalis* (p. 227).
- „ XVII.—*Stauropus fagi* (observations on the last moult of, p. 18), *Botys pandalis* (pp. 28 and 156), *Crambus culmellus* (p. 91), *Nonagria fulva* (p. 114), *Pempelia hostilis* (p. 178).
- „ XVIII.—*Ennychia octomaculalis* (p. 57), *Miana expolita* (p. 76), *Crambus Warringtonellus* (p. 129), *Scopula lutealis* (p. 147), *Emmelesia blandiata* (p. 180), *Hydræcia nictitans* (p. 195), *Papilio Machaon* (p. 244).
- „ XIX.—*Heliodes arbuti* (p. 36), *Rivula sericealis* (p. 49), *Ennychia anguinalis* (p. 77), *Ephestia passulella* (p. 104), *Pionea stramentalis* (p. 126), *Endotricha flammealis* (p. 149), *Dicycla Oo* (p. 203), *Pamphila linea* (p. 244), *Petasia nubeculosa* (p. 271).
- „ XX.—*Meliana flammea* (p. 63), *Endromis versicolor* (p. 73), *Bankia Bankiana* (p. 77), *Procris globulariæ* (p. 97), *Zygæna exulans* (p. 150), *Apamea fibrosa* (p. 176), *Aglossa pinguinalis* (p. 193).

Mr. Buckler also assisted the Rev. J. Hellins in the following description of larvæ, which have appeared under the name of the latter, in the pages of this Magazine:—

- In Vol. I.—*Lozogramma petraria* (p. 71), *Acidalia immutata* (p. 72), *Cidaria russata* and *immanata* (p. 165), *Ennomos fuscantaria* (p. 187, see also III, p. 159), *Nemoria viridata* and *Corycia temerata* (p. 263), *Tæniocampa gracilis* (variety of larva, p. 283).
- „ II.—*Ligdia adustata* and *Hyllernia leucophearia* (p. 16), *Acidalia rubricata* (p. 66), *Phorodesma bajularia* (p. 114), *Sterrhæa sacraria* (p. 134 and IV, pp. 179 and 200), *Botys asinalis* (p. 135), *Phytometra ænea* (p. 163, see also X, p. 139), *Scoria dealbata* (p. 190), *Luperina cespitis* (p. 211), *Emmelesia albulata* (p. 261), *Grammesia trilinea* (p. 278).

In Vol. III.—*Acidalia ornata* (p. 44), *Acidalia contiguaria* (p. 69), *Ennomos tiliaria* and *alniaria* (pp. 161, 162), *Leucophasia sinapis* (p. 210), *Acidalia rusticata* (p. 259), *Spilodes sticticalis* and *Anchocelis lunosa* (p. 260), *Thera simulata*, *obeliscata* and *firmata* (p. 277).

„ IV.—*Acidalia emutaria* (p. 88), *Lithostegia niveata* and *Agrophila sulphuralis* (p. 115), *Hyria auroraria* (p. 158), *Tethea retusa* (p. 180).

„ V.—*Zygæna nubigena* (p. 73), *Acidalia holosericata*, *interjectaria*, *scutulata* and *bisetata* (pp. 95—99), *Fidonia pinetaria* (*brunneata*) (p. 108), *Lithosia molybdeola* (*sericea*), *griseola* (see also X, p. 69), *mesomella*, *plumbeola* (*complanula*), *Calligenia miniata*, *Lithosia helveola* and *aureola* (pp. 109—114), *Dasycampa rubiginea* (p. 206).

„ VI.—*Emmelesia unifasciata* (p. 186), *Hyphenodes costæstrigalis* (p. 216), *Hydrelia unca* (p. 232).

„ VII.—*Deilephila livornica* (p. 99), *Lycæna Alsus* (p. 186 and X, p. 43), *Camptogramma fluviata* (p. 279).

„ VIII.—*Phibalapteryx lignata* (p. 18), *Dasydia obfuscata* (p. 20), *Hybernia aurantiaria* (p. 90), *Aspilates gilvaria* (p. 116), *Phibalapteryx lapidata* (p. 165).

„ X.—*Eubolia lineolata* (p. 255 and XI, p. 16).

„ XI.—*Boarmia roboraria* (p. 40), *Erastria fuscata* and *Pyrausta punicealis* (p. 66), *Larentia olivata* (p. 86), *Asthena Blomeraria* (p. 87), *Lycæna Adonis* (p. 113), *Syrichthus alveolus* (p. 236 and XII, p. 232).

„ XII.—*Larentia ruficinctata* and *cæsiata* (pp. 5—7 and 113), *Agrotera nemoralis* (p. 232).

„ XIII.—*Anarta melanopa* (p. 11), *A. cordigera* (p. 12), *Asthena sylvata* (p. 213), *Lobophora hexapterata* (p. 249).

„ XIV.—*Anisopteryx æscularia* (p. 113).

„ XVIII.—*Himera pennaria* (p. 33).

In addition to all the foregoing, two descriptions of larvæ from the joint pens of Mr. William Buckler and the Rev. John Hellins, appeared in the Entomologist's Annual for 1864, p. 137, viz., those of *Oporabia filigrammaria* and *Cidaria sagittata*.

One description, that of the larva of *Nonagria typhæ* by Mr. Buckler, appeared in "Young England" for March, 1865, whence it was quoted in the Zoologist for 1865, p. 9513.—H. T. S.

My friend Mr. W. Buckler has died without being able to achieve in person the object, for which he had laboured long and steadily, namely, the publication of an original work on the larvæ of the *Macro-Lepidoptera* of Great Britain; but we may trust that his labour will not have been altogether in vain: in him we have lost the living guide, who could speak with the instinctive knowledge, which long work alone gives, but his drawings and notes remain, and it is hoped some arrangement may be possible for their publication.

Meanwhile, as I was perhaps his oldest intimate entomological friend and associate amongst the considerable number who, at different periods, gave him their help, I may be allowed to say a few words about him and his work.

We became acquainted with one another in the summer of 1858, when both were beginning to take up the study of the *Macro-Lepidoptera* to some purpose; he wrote to me for eggs of *Smerinthus tilia*, which I had offered in the *Intelligencer* to give away: this was my first and last time of making an offer of this sort, for it opened upon me such an experience of the lengths to which the *amor habendi* urges many collectors, that I never again ventured on inviting their applications; but it also procured for me one of the most solid and satisfactory pleasures of my life—the friendship of William Buckler. There must have been something in his letter, which at once drew me to him, for very soon we had become constant correspondents: Stainton's Manual with its descriptions of larvæ all taken from foreign authors, had stung us into desiring to wipe off what seemed a blot on the fair fame of British Entomologists; I had, like many others, who for a time have taken in hand such a scheme for themselves, begun to figure such larvæ as I could get hold of, but when I found that Mr. Buckler, possessing the trained skill of a first-rate artist, and—since photography had taken away his occupation—having time at his disposal, had formed a similar plan, it at once became apparent that the best thing for me was to supply him with subjects, and thus set him free to devote more pains to their delineation; but he would not accept help without making some return; so a sort of treaty was drawn up and signed, pledging me to send him all the larvæ I possibly could, and he in return was to give me his first figures, after he had copied them into his interleaved Manual. What a spur this was to my collecting energy, then in its first freshness and zeal, to know that everything was to be figured in life-like style, and to expect to become the possessor of a whole gallery of larval portraits! Through the summer months of 1859, and many succeeding years, we wrote to one another almost every day, and often after a letter or a box had been despatched by the afternoon's post, a second epistle was begun at night to announce some fresh acquisition, which he was to make ready to pourtray as soon as he had finished the subjects already in hand. At first I doubt if there was any definite purpose of publishing more than descriptions, the figures being intended chiefly as memoranda, but as time went on, and the Manual pages became more and more filled, the intention of publishing an illustrated book became fully settled, and Mr. Buckler worked on towards that end with ever-growing interest and zeal, and before his death had figured more than 850 species, in most cases to the extent of five or six varieties, or stages of growth, and in several to the extent of a dozen or fifteen; in 1873 he reckoned he had done at least 5000 figures, and since that time must have added many more, for he has left more than 4500 among the materials amassed for his projected work, while I possess some 1800 of his doing, and there must be several in the possession of others; he left also four volumes of MS. notes, from which were extracted the substance of his numerous communications to this Magazine, which he looked upon as acknowledgments for help given, and as keeping alive an interest in his doings; but there remains over and above these a considerable quantity of observations never yet published.

When he first began, fishing and boating, and other recreations, still held their sway over him, and would sometimes interfere with the figuring of a larva; the yearly visit to London for a sight of the Royal Academy Exhibition was a fixed holiday, and larvæ that came to maturity whilst he was thus engaged had to spin up unfigured; but for many years all this had been changed; all his other movements

came to be regulated so as to suit the convenience of the larva of any species that had not been figured before, and even bodily ailments, which might have frightened most into desisting from close application to such work, were resolutely conquered by the exercise of a strong determination: his right hand was at times subject to a kind of palsy, called, I believe from an allusion to a frequent cause of it, "Scrivener's thumb," and during these attacks he could scarcely write legibly, much less hold a pencil to draw with; when this was so, his remedy was to set himself a task of carpentering; he had a full chest of tools, and was a beautifully neat workman, in fact, he made his own cabinet of 24 drawers in capital style; but for exercise he would work for a week, or a month, or whatever time he felt necessary, at house-carpentering, mending all the doors, window frames, boxes, &c., that were found out of repair, and thus he would bring his rebellious nerves and muscles to their finer work; and though he became slower as age advanced, yet to the last he could use his pencil for the faithful representation of the most delicate pattern and colouring; I believe I have the last figure he drew, namely, the copy of one he had taken of a larva of *Deilephila euphorbiæ*, which had been sent to us by Dr. Chapman from the Continent, and this done in November last is perfect in all its intricacy of detail as well as in general outline and effect. And so he toiled on year after year, meaning when he had reached a certain point, to lay aside the pencil, and give all his time and energy to the work of publication. Whether he would ever have satisfied himself that he had done enough, I almost doubt; as his work went on, it seemed to grow before him; details, which at first were slightly noticed, assumed their real importance, and he found himself obliged to repeat observations over and over again; fifteen years ago he had begun to wonder whether he should live long enough to begin to publish; after three years' attention to some common species of *Agrotis*, he wrote that he had burnt many of his figures, as he had come to find them incorrect; and quite recently he was figuring again such species as *Pieris brassicæ* and *Cheimatobia brumata*.

As the readers of this Magazine are aware, he had recently resolved to avail himself of Continental help in procuring species not easily attainable here, and this, as well as the adoption of the mm. as a scale of measurement, is remarkable as coming at an age, when changes are to most men no longer acceptable; but a stronger mark of his keeping his mind to the last fresh and open is given by the fact, that after his sixty-eighth birthday he procured a German grammar and exercise book, and worked hard at them all through the winter of 1882-83, in the confident hope of being by and by able to read the letters of his German correspondents, and to tell them what he wanted in his own handwriting, and I know that in this view Prof. Zeller's death was a great blow to him. Mr. Buckler possessed nothing that could be called a library; the *res angusta domi* forbade the acquisition of expensive books, but this made the loan of a standard work from a friend all the more appreciated as a great delight; he would sit up into the small hours of the night mastering its contents, or neatly copying out page after page, that struck him as containing valuable help for his own purpose; and so, too, with illustrated books, he must have taken copies of hundreds of the figures in the plates of Hübner and Sepp and others. When we first became correspondents, and he was still sore from the injury which photography had done him, he had a whimsical way of taking revenge by getting himself photographed in all sorts of stiff attitudes and sullen expressions, such as all

can remember to have seen in the cartes of themselves or their friends; I have now several of these which he sent me, at the same time pointing out their absurdities; but he must have overcome this contempt for photography, for he also sent me two likenesses taken at different times, for which he had *posed* himself, and with which he was content, the last one showing in the prominence of the right eye the effect of constant use of the magnifying lens. And this leads me to say that it is, of course, as an indoor worker that Mr. Buckler has made his mark; his sight was never good enough to enable him to become a very successful collector, but in the way that was open to him he was a most patient and loving student of Nature; that he might have his broods of growing larvæ always under observation (and in this he owed much to the kind help and attention of the friends with whom he lived), he used to keep them either on plants in flower pots on the window seats of his bed-room and sitting-room, or else in German test tubes of very thin glass, through which he could watch every movement, and lens in hand he would sit for hours, alternately observing and recording the habits of any fresh species. Of course it follows from this that his name is associated with detailed accounts of life history, and not with captures of new species, but it is remarkable that the last figure he took from life, in October, 1883, was that of a pug larva, singled out from a large batch I had sent him, and which, as he could not identify it with any of our known British species, he was hoping might turn out to be new.

It is difficult to know where to stop in speaking of one, who has been so very much to me, and who, though I saw him on three occasions only, was by our constant interchange of letters always, as it were, present; but I will add one thing more; the fascination, which Natural history exercises over observant minds, my friend felt and enjoyed to the full; and it touched in him a yet deeper spring of pleasure; on the fly-leaf of the 2nd volume of his copy of Stainton's Manual, I found written—apparently some time after he first began to use the book, and as the result of later reflection,—this quotation, “For Thon, Lord, hast made me glad through Thy works, and I will rejoice in giving praise for the operations of Thy hands.”—J. H., Exeter, 12th February, 1884.

NOTES ON BRITISH *TORTRICES*.

BY CHAS. G. BARRETT.

(Continued from page 135).

Referring back to Vol. xi, p. 29, of this Magazine (July, 1874), it will be seen that in the course of these notes I arrived at the genus *Oncophasia* of Curtis (*Sciaphila*, Tr.), and after a few remarks on the two very distinct species, *cinctana* and *hybridana*—which, indeed, hardly belong to the genus—I found it desirable to defer any detailed notice of the remainder until further information upon our native species could be obtained. Nearly ten years have passed, and the genus is still involved in difficulty, but it seems time that such knowledge as we have of it should be brought together, if only as a basis for further investigation.

From long and careful observation, and the examination of vast numbers of specimens, it seems certain that the attempt to define the species of *Sciaphila* by means of their *markings* is practically hopeless. In most of the species the ground-colour is grey or white, or even grey in the male and white in the female; and the markings—of some shade of grey—consist of a curved, elbowed, or abbreviated fascia near the base of the fore-wing, representing the exterior margin of the usual basal blotch, an oblique central fascia angulated and indented, and apical blotches indicating a third fascia across the tip, and all these are so irregular, so uncertain, so broken up by interruptions, and obscured at times by dark scales or round dots, that any hope of defining the species by their means must, I think, be abandoned. Yet they may be used as secondary characters in confirming distinctions arrived at in another way.

Wilkinson, in his work, appears to have overlooked the reliable characters afforded by the *forms* of the fore-wings, which really seem to be tolerably constant in the different species. He certainly notices the peculiarity in *Sphaleroptera ictericana* of the nearly straight costa, and uses it in separating this species as a distinct genus; but he seems not to have noticed that the costa of *ictericana*, ♂, is no straighter than that of several species of *Sciaphila*, and the only really distinctive character in *Sphaleroptera* is the unsatisfactory one that the ♀ *also* has the costa straight.

The genus appears to bear sub-division into groups, thus:—

1. Fore-wings short and broad: *nubilana*, *abrasana*.
2. Fore-wings elongated, broad, costa gently arched: *virgaureana*, *alternella*, *octomaculana*.
3. Fore-wings broad, costa strongly arched before the middle: *sinuana*.
4. Fore-wings elongated, rather ovate: *pascuana*.
5. Fore-wings elongated and narrow, costa slightly arched: *conspersana*, *subjectana*, *communana*, *Wahlbomiana*?, *ictericana*.
6. Fore-wings very long and narrow, hind margin very oblique: *Penziana*, *Colquhounana*?

With the assistance of these characters, it may be possible to get some idea of the different species, or, perhaps, in some cases, permanent varieties.

nubilana, Hüb.—Fore-wings each 3 lines long, by $1\frac{1}{2}$ broad, of fairly equal breadth, with short costa, blunt apex, and rounded hind margin. In the female rather broader and still rounder. A dark grey insect, accurately described by Wilkinson.

A very plentiful species among hawthorn in some districts. Mr. Machin has reared it from hawthorn and blackthorn. He says that the larva is pale green, feeds between leaves drawn together, and assumes the pupa state among them.

abrasana, Dup.—Each fore-wing $4\frac{1}{2}$ lines by $1\frac{2}{3}$, rather broader towards the hind margin, costa nearly straight, apex blunt, hind margin rather rounded, not very oblique. A larger species than *nubilana*, of a rather smooth-looking dull dark grey, with a brownish tinge, almost devoid of markings, except a mere shadow of the oblique central fascia, and sometimes a few scattered black dots. These black dots are rather strongly developed in a very curious moth, taken many years ago on the moors of Cumberland by Mr. W. Thompson, of Stony Stratford, which moth must be, I think, a large *abrasana*.

This species seems to be rare or extremely local in this country. A specimen was taken in a dry lane in Wiltshire by Mr. E. Meyrick in August, 1876, and I have seen three specimens from the collection of Mr. G. Harding, of Bristol, who took them more than twenty years ago, and believes that the species was common when he took these.

virgaureana, Tr.—Each fore-wing measuring 4 lines by $1\frac{5}{8}$ to $1\frac{3}{4}$, fairly broad, with well rounded costa and blunt apex. This most abundant species is fairly well described by Wilkinson, it is usually much irrorated with round dark grey dots, obscuring the ground colour, and sometimes the markings are also much obscured.

The larva seems to be quite as variable as the moth. Mr. Machin has reared the species from “a dirty green larva feeding on *Genista anglica*.” Mr. Buckler communicated the following description, taken from a larva found on *Teucrium scorodonia*:—“Light greenish-grey above, paler flesh-coloured—greyish below, with a darker dorsal line, and rather less dark sub-dorsal line. Tubercular spots black, anterior-legs black, a blackish plate on second segment, head light reddish-brown.”

Mr. A. Balding, of Wisbech, “collected a lot of larvæ from water betony, and sorted them into two lots, one with spots lighter than the ground colour, the other with them darker. All produced *virgaureana*.”

My own descriptions also vary:—“Sluggish, cylindrical, plump, smoky-black, spots faintly shining, head light brown, plates jet-black, hairs rather long. On *Plantago lanceolata*, drawing together each leaf, lengthwise, in the middle”; and another: “plump, pale bluish or greyish-green, dots black, small, but distinctly visible, especially

across the anterior segments, head pale brown, dorsal plate pale brown, with blackish dots or a black bar, anal plate green with black spots. In tops of *Lathyrus*, twisting and drawing together the terminal leaves, also in *Genista tinctoria*, end of May." "Pupa black-brown."

alternella, Wilk. (Schiff. ?).—Fore-wings 5 lines by $2\frac{1}{8}$; a broad-winged species, with moderately arched costa, blunt apex, and a decidedly squared appearance. Occasionally a female is found of remarkably large size. The costa in this sex is more arched.

Wilkinson's description is fairly good, but his dimensions are too small. This fine species is generally found on rough ground among the herbage, and flies readily before dusk. It seems only to shelter on tree trunks casually from stress of weather. I have not yet obtained the larva. Mr. W. H. Grigg, of Bristol, has reared one specimen from a larva found on *Conyza squarrosa*. Mr. Harold Ruston finds the moth rather commonly near Chatteris, where *Carduus arvensis* is abundant, and suggests this as its food-plant; and, some years ago, Mr. E. Meyrick (who has been lately doing splendid work at the antipodes) wrote me that it was common near Cambridge, and "very evidently attached to thistles, *Carduus arvensis*), in fact, I took several where it *must* have fed on that plant."

It used to occur in old chalk-pits and on other rough ground at Norwich, where I thought it attached to *Centaurea*.

Hofmann says, "according to Mann, with black head and neck-shield, and white warts; in spring, on *Chrysanthemum*."

Wocke calls this species *chrysanthæana*, Dup., ignoring *alternella*, Schiff. (which, probably, is not *very* certain), and quoting *alternella*, Wilk., as a synonym. He does not include it in the large group which he lumps together as *Wahlbomiana*.

octomaculana, Haw., Curt.—Fore-wing 5 lines by $2\frac{1}{4}$, a very square looking species, easily distinguishable as well as by its shape as by its beautifully clear white ground-colour, with distinct blackish-grey markings, and dark grey hind-wings. It is one of the least variable species in the genus.

Some years ago, Mr. J. Dunsmore, then residing at Paisley (now, I hope, doing good work in the United States), took much pains to supply me plentifully with larvæ as well as imagoes of this lovely species. He wrote:—"It is one of our commonest hill-insects, and may usually be picked off old stone walls without trouble, and in any numbers. Its larva feeds like that of *ictericana*, in rolled leaves of plantain and knapweed, leaving a way of speedy escape at top or

bottom, most commonly at top. It is very active, and of a dark sooty or almost black colour, not so stumpy as *ictericana*, in fact, rather long and thin, and wriggles out at the top of the tube when disturbed, so that you require to be active to take it. The young leaves of the knapweed seem to be the most acceptable food." The larvæ sent were thickest in the middle, and when young, in the beginning of June, of a pale silvery-grey, slightly darker on the back, pale yellowish beneath, spots distinct, black, head and plates black. A fortnight later smoky-black, more bluish-grey on the back, paler between the segments, spots large, raised, shining black, head pale brown, blackish at the hinder margin, plates black; curls up when disturbed. On *Centaurea nigra* and *Plantago lanceolata*. Pupa blackish.

I have not met with any record of the occurrence of this very distinct species on the continent. Its nearest ally seems to be *styriacana*, H.-S., a very pretty species, with *white* hind-wings, found in Austria and Switzerland, but confounded by Wocke with the more narrow-winged *conspersana*, Dgl., = *perterana*, Gn. My German example of *Penziana*, Hüb., also appears to represent a species of this group—a very beautiful species, resembling our so-called *Penziana* in colour and markings, but with broader wings.

sinuana, Steph.—Fore-wing 5 lines by 2. Costa strongly arched before the middle, then nearly straight to the apex, thus having a remarkable resemblance in shape to a *Peronea*. It is also more silky in its appearance, and more regularly and delicately reticulated with grey scales than any other species. It varies very little in markings, and the peculiar form of the abbreviated, pointed, curved, basal fascia is extremely reliable.

It is still a rare species, though widely distributed. The Rev. E. N. Bloomfield has taken one near Hastings, and Mr. Grigg several near Bristol, but it seems to occur more frequently in the Perthshire highlands; I have a record of one at Lochgoilhead, and it has been taken by Mr. F. D. Wheeler and Mr. T. W. Salvage in the Blackwood and on the mountains at Rannoch. The only record that I have of its larva is from Mr. Sang, who took several of the moths near Burton-on-Trent, and reared one from a larva found feeding in a web on flowers of wild hyacinth.

For some reason which does not seem clear, this species is sunk by Wocke as a synonym of *pasivana*, Hüb., which figure it does not resemble at all. There is certainly no more reliable and clearly defined species in the genus.

pascuana, Hüb., Wilk. (erroneously spelt *pasivana*, Hüb., 99, but corrected in a subsequent work—*Verzeichniss bekannter Schmetterlinge*).—Fore-wing $4\frac{1}{2}$ lines by $1\frac{1}{2}$, rather long and oval, the margins being curved and much rounded off. Rather a smooth and greasy looking insect, with its markings much obscured by grey scales. Easily distinguished from all the other species in the genus by the very considerable over-lapping of its wings when in repose, and its consequent appearance of *narrowness*. It is very plentiful indeed at Brandon, and found in many parts of the country, but usually confounded with *virgaureana*, from which the over-lapping wings readily distinguish it.

Mr. W. R. Jeffrey, of Ashford, describes the larva as yellowish-grey with black spots, feeding on flowers of *Hypochæris radicata* and *Anthemis arvensis*.

Dr. Wood, of Tarrington, and Mr. W. Thompson, of Stony Stratford, have reared it from *Chrysanthemum leucanthemum*. My own efforts to rear it have, so far, been unsuccessful.

Among the examples of *Tortrices* sent me by Professor Zeller some years ago, are several specimens of a peculiar grey-brown—almost yellowish-brown—*Sciaphila*, labelled "*pascuana*, F. v. R." These seem to be very close to, if not identical with, a pale greyish-brown, or yellowish-brown, *Sciaphila*, which is found in plenty in salt marshes in the south of England, and particularly on both sides of the mouth of the Thames. This form seems pretty constant in size and colour, and, in *absence* of markings, but it also corresponds so very accurately in size and shape with *pascuana*, Hüb., that there seems little probability that they are really distinct. The markings, when visible, also agree closely with those of the latter.

I am indebted to Messrs. Sydney Webb and Howard Vaughan for specimens. Mr. Webb has reared one specimen (accidentally) from *Aster tripolium*. This variety appears to be plentiful in the drier parts of the salt marshes, and scarcely to be known elsewhere. It was, I believe, first noticed there by Mr. S. Stevens many years ago. Mr. Webb says that it emerges in June and July, and continues out a long time. In colour, it shows a remarkable divergence from typical *pascuana* and the remainder of the genus, leaning strongly towards that of *S. ictericana*.

conspersana, Dougl., Wilk. (*perterana*, Gn., MS.).—Fore-wing 5 lines by $1\frac{5}{8}$, long and narrow, with the costa straight beyond the middle, apex somewhat pointed, and hind-wings oblique.

Wilkinson's description is good, except that he does not remark the length of fore-wings, in which this species closely approximates to *ictericana*.

It is common in some parts of the western coast, particularly on the mountain limestone of Pembrokeshire, attaining a larger size and much greater depth and distinctness of marking, than specimens from the chalk districts of the south coast. But this species has already been remarked upon (Ent. Mo. Mag., vol. xii, p. 230), and repetition is unnecessary. Its larva is over half-an-inch long, sluggish, stout, tapering at each extremity, very pale greenish-grey, yellowish beneath, and semi-transparent; spots small, black, head and plates yellowish-brown. Drawing together the ray-florets of *Chrysanthemum leucanthemum*, in June, and feeding on the disc-florets and seeds. Also in blossoms of *Apargia hispida* abundantly, and more rarely in those of *Hypochæris radicata*, *Aster tripolium*, and *Ranunculus bulbosus*. In the absence of suitable flowers on the sea-cliffs, it is quite at home on the tops of *Teucrium scorodonia* and *Senecio erucifolius*, drawing together the terminal leaves and eating out the heart. When feeding in the flowers of oxeye and *Apargia* it folds down the ray-florets regularly and neatly, so as to form a comfortable, and also a conspicuous, habitation. The pupa is blackish-brown, often spun up in the flower, and the moth emerges in July.

Mr. Doubleday seems to have suppressed *conspersana*, Dougl., in his list, because there is a *conspersana* in the genus *Teras* (a synonym of *ferrugana*), and substituted *perterana*, Gn., an unpublished name. I think that there is no reason for this.

subjectana, Gn.—Fore-wing 4 lines by $1\frac{1}{2}$, costa very little arched, nearly straight beyond the middle, hind-margin rather oblique. The most abundant species of the genus. Generally, its ground-colour is pale and very little suffused with grey scales, so that the markings are usually distinct. It is constantly mixed with *virgaureana*, but has narrower and more pointed wings, and a straighter costa.

Its larva varies a good deal, partly, no doubt, at different ages. Mr. Machin has reared it from a brownish-black larva on the common plantain, and others on sorrel and chickweed. Mr. Sang used to find it at Darlington feeding on *Lotus* and other vetches. I have had larvæ; cylindrical, except that they were slightly tapering at the ends, smoky-brown, with brown head and black plates. In blossoms of *Ranunculus acris* and *bulbosus*, drawing together the petals and feeding on them and the anthers in June; also smoky-black spots slightly paler, head

brown, plates black, in flowers of *Chrysanthemum leucanthemum*. It always rolls into a ring when disturbed. The pupa is blackish. *Incertana*, Tr., seems to agree closely with this species.

communana, H.-S.—Fore-wing 5 lines by 2 barely, long, and fairly equal in breadth, hind-margin rounded, apex not very pointed. A handsome species, readily recognisable by its shape, having even, oblique, dark grey fasciæ, and the whole wing generally irrorated with grey scales, or even dots. The distinctness of this species from typical *Wahlbomiana*, and its remarkably long wings were pointed out to me long ago by M. Ragonot, who also sent examples.

In this country, it has been noticed principally in Cambridgeshire and Huntingdonshire. Mr. Harold Ruston took a number of specimens some years ago near Chatteris, and this year several have reached me, taken by Mr. A. F. Griffith, at St. Albans, where it does not seem to be rare.

Wahlbomiana, L.?—This is not a satisfactory name to apply. Wocke unites under it, *virgaureana*, *subjectana*, and *communana*, with a lot more names, but Ragonot assures me that it is a small species, narrow-winged, but not so long as *communana*.

Some years ago, Mr. J. Gardner, of Hartlepool, reared several small *Sciaphilæ* from tops of *Artemisia maritima*, which seemed to me to agree with this description. They resembled *virgaureana*, but had a much straighter costa, quite straight in fact beyond the middle. Larvæ were sent to me, but they did not like the change of air, or of food, and I only reared a very poor specimen, but cannot refer it to any species, the straight costa, blunt apex, and narrow wings being so peculiar. Further investigation will be necessary to prove, first, whether it is distinct from all the previous species, and, secondly, whether it agrees with Linné's type of *Wahlbomiana*.

Penziana, Wilk. (? Thunb.), *bellana*, Curt.—Length of fore-wing 6 lines by $2\frac{1}{2}$ in breadth, long and narrow, and nearly triangular, being very narrow at base, with nearly straight margins and long apex. A very handsome species, with white ground colour, and sharply defined, indented narrow blackish fasciæ. Found on rocks and hills about Keswick, Cockermouth, Rannoch, and other northern hill-regions.

The only information that I have respecting its larva is from Mr. Hodgkinson, who says:—"The larva is a grass feeder, nibbles the tops of fescue-grass at night, and lives in a silken gallery at the roots of the grass. It is a hard species to breed." Mr. Hodgkinson sent me

a larva feeding among roots of a small wiry grass, which, however, I fully believe was that of some species of *Crambus*; I was unable to rear it.

I have an example of a very beautiful *Sciaphila*, similar to this, with much broader fore-wings (sent by M. Ragonot, and taken, I believe, on the Alps), under the name of *Penziana*, certainly a distinct species, which seems to agree fairly with Hübner's figure. Mr. Doubleday also heard, many years ago, from Dr. Wocke, that this species was not the *Penziana* of Hübner. It seems desirable, therefore, to adopt a name about which there cannot be much doubt = *bellana*, Curtis.

Colquhounana, H. D. Catalogue.—Closely allied to the last species is a handsome form which has stood in lists and collections for many years under this name. Its size and measurements are almost exactly the same as those of *bellana*, but the dorsal margin of the fore-wings is not so straight, making the wing a little broader near the base, and not so sharply wedge-shaped. It is a handsome species; ground-colour of fore-wings slate-grey, varying much in intensity, and occasionally whitish in the central area. Markings of the usual fasciæ much like those in *bellana*, but slightly more oblique, and not nearly so sharply defined. Hind-wings whitish, tinged with grey at the margins. Head and thorax of the same shade of grey as the fore-wings.

The late Mr. T. H. Allis, writing in 1868, told me that he believed it to be distinct (from *bellana*, Curt.), that it "occurred in lower ground than that species." It is, in fact, like *conspersana*, an inhabitant of sea-side rocky localities, taking the place of that species on the more northern west coast. It is tolerably common in such places near Dublin and the Isle of Man. Mr. Hodgkinson asserts that it was reared by Mr. Gregson from the roots of sea-pink.

ictericana, Hw.—I see no reason why this species should be excluded from *Sciaphila*. It is very nearly allied to *conspersana*, and a grey variety reared by Mr. Jeffrey, of Ashford, is quite undistinguishable from a *Sciaphila*. Larvæ sent by Mr. Jeffrey were moderately long and slender, slightly attenuated at the extremities, pale yellowish, with rather broad dorsal and subdorsal longitudinal greenish-grey lines, spots black, head pale brown, with a black spot at each side, plates pale brown. In blossoms of *Hypochæris radicata*, *Anthemis arvensis*, and *Chrysanthemum leucanthemum*, drawing together the ray-florets. Feeding in May and June, moth emerging in July. Pupa light brown.

THE LARVA OF *HEDYA SERVILLANA* AND ITS HABITS.

BY JOHN H. WOOD, M.B.

In the spring of last year I was much interested by finding, in the shoots of sallow, a larva that in the end proved to be this species. I am aware that in this I can lay claim to no discovery; Mr. Bond has already stated that it feeds in sallow, and Herr Anton Schmid says, in a swelling in sallow shoots, but as neither observer, so far as I know, has given any particulars, nor entered into a description, I have put together the following notes, which will, I hope, render fairly clear the œconomy of this scarce species, and at the same time enable Entomologists to meet with it more readily than hitherto.

The larva forms a symmetrical swelling, I mean by that an enlargement running equally round all sides of the stem, on the shoots of the broad-leaved sallow (*Salix caprea*) in those localities where the shrub occurs among young undergrowth in woods. The swelling is oval in outline, with a circumference, at the widest part, barely half as much again as that of the sound stem; it measures 8 or 9 lines in length, and occupies the site of a bud, extending, usually, as far below it as above it, and, in most cases, without interfering with its vitality. The circumstance of its position, combined with its gentle outline and moderate girth, render it a somewhat inconspicuous object, and liable to be mistaken for the natural thickening that occurs at the origin of the buds; this is especially likely to be the case whilst the leaves are on, but in the winter months its recognition is not difficult, for the eye runs over the naked twigs, and quickly distinguishes the symmetrical swelling caused by the larva from the one-sided one of the bud. In its attack on the tree the insect invariably selects shoots of the year, and when these are vigorous, and such are the ones usually chosen, no injury is done beyond the production of the enlargement, but when weaker shoots are attacked or the mine is placed too near the end, then the part beyond ceases to grow, acquires a stunted appearance, and, at length, dies, becoming in the course of the winter black and shrunk. The point where the larva enters is just where the apex of the bud touches the stem, and this is so generally the case as to lead to the conclusion, that the moth is guided by the bud in laying her egg, and deposits it at this particular spot. At first, communication is maintained with the outside, and the frass is thrown out and caught on the parts below, but before the larva has ceased to feed, the opening gets closed up, and its site marked by a small brown scar, through which the perfect insect eventually breaks. The mine is cylindrical, short

and narrow—the upper part contains the frass and is rather the most capacious, in consequence of the removal, to some extent, of the woody tissue, while the lower part occupies little more than the pith-canal. The whole length of the mine has never exceeded, and rarely reached, an inch in any of the numerous specimens I have examined. It is impossible not to be struck with the smallness of these dimensions, and their apparent incapacity for supplying material enough to build up an insect of this size, so that I am inclined to think that the larva derives a considerable part of its nourishment directly from the sap, which it probably licks up from the walls of its tunnel. And confirmation is given to this view by the character of the frass, which is small, irregular, and excrementitious-looking, instead of being large and well-formed, as would be the case, did a large part of the food consist of indigestible material. I have no information when the larva hatches, but as the galls are found fully developed in the middle of August (Aug. 19th), this event probably takes place some time in July. It continues to feed up to the end of September, and in October lines the upper part of its dwelling with a close coating of silk, cutting it off from the part below by an open fragile diaphragm of the same material. Within the chamber so formed it remains unchanged through the winter, and goes into pupa in the spring, the case being completely extruded, and dropping to the ground on the emergence of the moth. So far as my experience goes, it is but little subject to parasites of any kind, but a large number, in the course of the winter when food is scarce, fall victims to the tom-tits, who appear to have discovered what a savoury morsel the swelling hides, and by means of their strong little beaks succeed in getting possession of it.

The larva is cylindrical, moderately stout, tapering slightly from the 10th segment, and with large prominent dark spots, from each of which springs a small white hair. Head rather small, narrower than the following segment, jet black and shining. Thoracic plate black and shining, but less so than the head, and divided down the middle by a pale line. Legs and anal plate dark grey. Colour very pale grey, but changes, during hibernation, to white with a tinge of yellow. The dorsal vessel, in some specimens, partially visible as a red line. The spots are grey and conspicuous—the anterior trapezoidals roundish-oval in shape, the posterior ones, oval. The row of large somewhat conical spots in the spiracular region are notched on the lower side for reception of the spiracles. These are round and black, and surrounded by a pale ring.

Tarrington, Ledbury :
14th February, 1884.

A NEW SPECIES OF *SCYDMÆNUS*.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

SCYDMÆNUS POWERI, n. sp.

Sat convexum, nigrocastaneum, pilis longis flavis indutum; pronoto longiore, ante medium latissimo, lateribus antrorsum rotundatis, ad basim sensim contractis, foveis quatuor parvis ad basim impresso; elytris ovatis, convexis, dilatatis, ante medium latissimis, quatuor magnis foveis ad basim, et puncturis modicis haud profundis diffusius impressis; antennis sat longis, flavis, primo et secundo articulo pari longitudine, tertio his in feminis vix, in maribus aliquantulum brevioribus, tribus ultimis sat subito latioribus, ultimo apice modice acuminato.

Differt a S. pusillo colore et forma et puncturâ elytrorum minus profundâ; a S. Sparshallii sculpturâ thoracis, et tertio antennarum articulo valde abhorret.

Length, $\frac{1}{2}$ lin.

Head rather large: eyes large and somewhat prominent. Antennæ pale testaceous, rather large; first and second joints about equal in length; third joint shorter than the preceding, but not very perceptibly so in the female.

Thorax longer than broad, anteriorly rounded, very gradually narrowed towards the base, impunctate, thinly covered with long yellowish hairs; with four small round foveæ, not connected by any line, at the base; the two centre ones are close together, and their sculpture is rather indistinct in some specimens.

Elytra oval, rather wide, convex, rather thickly covered with long yellowish hairs, with four large depressions at the base—the inside pair being considerably the larger—and with rather large shallow and somewhat diffuse punctures.

Legs yellow; femora somewhat inflated at apex.

This species comes rather near *S. pusillus*, Müll., but may be distinguished by its colour, which resembles that of *S. elongatulus*, as well as by its general form, smaller size, and the shape and punctuation of the elytra, the latter in *S. pusillus* being evidently coarser and more diffuse than in *S. Poweri*.

Dr. Power has for some time had this species turned on one side in his cabinet as distinct, and, as it has been returned to me by M. Fauvel as unknown, I venture, at Dr. Power's request, to describe it.

Eight specimens taken by Dr. Power, one at Seaton, in Devonshire, on January 3rd, 1866, two at Wimbledon, on February 23rd, 1867, three at Wimbledon, March 25th, 1871, one at Birdbrook, Essex, August 18th, 1865, and another in the same locality, April, 1868. It is a marsh species.

The School House, Lincoln:

March 18th, 1884.

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

(Concluded from p. 205).

Ascending from the "tierra caliente" of Chiriqui, to 3000—4000 ft., the elevation at which the coffee plantations are usually made, the forest is of rather a different character, though very luxuriant; the growth is denser, it is, as might be expected, less tropical in appearance, the trees are not so lofty, there are fewer palms and of different species, fewer Musaceæ, fewer Arums, but more ferns, especially of the arborescent kinds, and Lycopodiums; as we go higher (5000—6000 ft.) the tree-trunks and branches are covered with moss—all reeking with moisture during the long rainy season; except for a short time in the morning, very little is to be seen of the sun, the higher mountain forest-clad slopes are constantly enveloped in mist; the clouds descending soon after mid-day to remain till nearly dark, and shrouding everything as in a fog; the tree-tops are, perhaps, just visible, above all is impenetrable mist; at this time the forest is very gloomy and dark, and not a sound of life will be heard except the dismal howling of the monkeys at intervals, even the large blood-thirsty *Tabanidæ* leave you in peace, the butterflies vanish, and the collector will no longer find anything to repay him for his work.

The mountain-sides are everywhere scored or cut up by enormous deep "barrancas" or ravines, sometimes 1000 ft. or more in depth, the sides of which are often so steep as to make the ascent or descent a matter of very considerable difficulty, at times an impossibility. At 8000 ft. (I did not succeed in ascending higher), some interesting butterflies occur, similar to those found in Costa Rica at a similar elevation—species of *Clothilda*, *Euterpe*, *Euptychia*, *Oxæoschistus*, &c., and a few beetles—minute species of *Hispidæ* and *Cebriionidæ*, some *Lampyridæ* not before met with, *Malthinus*, various *Phytophaga*, &c., chiefly obtained by brushing bamboo; the undergrowth at this elevation consists almost entirely of bamboo and small palms, tracks of the tapir were numerous here, and help the collector a good deal in getting about, otherwise he must cut his way everywhere. At 4000—5000 ft. a good many butterflies, &c., not to be seen in the low country, will be met with—species of *Euterpe*, *Mesosemia*, *Heterochroa*, *Papilio*, *Timetes*, *Pieris*, *Anæa*, *Leptalis*, *Apatura*, &c.; a gigantic *Noctua* (*Erebus*, *sp.*), the largest specimens of which are fully ten inches in expanse, will be seen occasionally settled high up on the trunks of the largest trees in the forest, looking like nothing so much as a

gigantic *Boarmia*, it rests in the same manner, with its wings spread out horizontally. Some very fine *Lamellicornes*—species of *Plusiotis* (metallic, golden or silvery in colour), *Antichira*, and others, may be found at an elevation of 5000 ft. flying in the hot sun round the tops of forest trees; *Lampyridæ*, *Longicornes*, *Phytophaga*, &c., of different species to those of the hot country. *Coleoptera* and *Hemiptera* are abundant at an elevation of about 3000 ft., and many of the species of the low country will be found as high as this; higher, fewer and different species are to be met with.

The highlands of the State of Panamá, unlike those of Costa Rica, are almost uninhabited; there are no villages except in the low country, travelling is in consequence very difficult, no roads, and the country exceedingly broken, the coffee plantations only made within the last few years, are, probably, the highest inhabited places in Chiriqui, and it is chiefly owing to being able to stay at these places I was enabled to collect at the higher elevations.

A great deal of forest is to be found in Chiriqui, besides the patches of wood on the plains, but as we go nearer to Panamá, into the department of Veraguas, we begin to leave the forests and come to a different sort of country and vegetation, very broken hills and valleys covered with grass and wooded only by the streams or in the hollows and forest of any extent only to be found high up on the mountain slopes. Certain *Malacoderms* (*Astylus*) swarm in flowers on these grassy hills.

I will say but little about Guatemala, as my remarks on Chiriqui will apply almost equally well to that country, fine forests are to be found there also, both in the highlands and in the low country; of course, lots of species met with there will not be found in Chiriqui and in the highlands. The fauna partakes much more of a North American character. Travelling is much easier in Guatemala; there are roads (or what are termed such) and a few bridges; villages or towns are scattered all over the country, except in Peten and part of Vera Paz, villages up to nearly 10,000 ft. above the sea, a cart road (over which the diligences pass in the dry season) running along the highest parts of the Cordillera between the capital and Quezaltenango, and ascending to little short of 11,000 ft., whence the ascent of at least one of the volcanoes (the Vole. de Agua, elevation nearly 13,000 ft.) can easily be made, and altogether there are far more facilities for work. Hot, dry valleys, at 3000 ft. or so, with plenty of *Cactaceæ* (not, however, productive to the entomologist), pine forests, &c., characteristic of certain parts of Guatemala, will not be found in Chiriqui.

Indians will not easily be found in Chiriqui to carry your luggage, everything has to be carried on pack horses or mules, unless you are making the three or four days' journey across to the Chiriqui lagoon on the Atlantic coast from David or Caldera, to make this trip you may, perhaps, find carriers; the path or road is seldom traversed except by natives, and is quite impracticable for horses or cattle.

I will now conclude my remarks on collecting in Central America, and hope they may be of use to future travellers.

274, Walworth Road, London, S.E.:

February 18th, 1884.

TWO NEW BUTTERFLIES ALLIED TO *APHNÆUS NATALENSIS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The two following species bear so strong a resemblance upon the upper surface to *Aphnæus natalensis** that, when we received them, I unhesitatingly placed them in the cabinet with our series of that species; indeed, the chief difference on the upper surface is in the greater width and more ochreous tint of the V-shaped band on the primaries: the differences on the under-surface are, however, more marked, and are as follows:—

APHNÆUS NYASSÆ, *sp. n.*

Under-surface creamy sulphur-yellow, purer in tint than in *A. natalensis*, the silver markings on the bands more continuous, almost touching, and in parts quite touching the margins of the bands, which are considerably thicker, and, for the most part black, though varied here and there with dull dark red; primaries with the third (oblique) band considerably more oblique than in *A. natalensis*, the costal spot further beyond it, the abbreviated discal band slightly irregular, the sub-apical costal spot absent, the sub-marginal lines slightly undulated and nearer together; secondaries with most of the spots towards the base filled in with dark red, the oblique post-median band slightly curved and well separated from the abbreviated discal band, which is narrower; instead of the two sub-marginal stripes, there is a single tapering, bright saffron-yellow stripe from the elbow of the post-median band (where it unites with the band from the abdominal margin) to near the apex, a slender, abbreviated, sub-apical black stria between it and the margin.

Expanse of wings, 35 mm.

Lake Nyassa.

* I may note here that the species figured by Hewitson in his "Illustrations," is not the true *A. natalensis*, or, indeed, at all nearly allied to it.

APHNÆUS VICTORIÆ, *sp. n.*

Wings below of a decided sulphur-yellow colour, excepting towards the internal margins; the silver markings in the bands slender and rather dull, borders of the bands on the primaries and towards costa of secondaries thick, and, for the most part, black, oblique post-median band of primaries slightly curved, not single at its inferior extremity, costal spot beyond it further away, abbreviated discal band distinctly sigmoidal instead of straight; no sub-apical spot; two sub-marginal lines thick and near together; sub-basal markings very strongly defined with partly black and partly red borders; oblique elbowed post-median band excepting at costa with very slender margins; abbreviated band elbowed and almost divided, a spot at costa being separated from the main body by a black oblique line; inner sub-marginal line black, straight, outer line abbreviated, and only remaining at apex.

Expanse of wings, 37 mm.

Victoria Nyanza.

It will be seen that in some respects these two species are more like one another than like *A. natalensis*: the differences are such as have been proved to be constant in this genus, and as such have been used even by men holding the expansive views touching the variability of species of the late W. C. Hewitson: I think I need say no more than that to establish their claim to separate attention: of *A. natalensis* we have six examples from Natal, besides those in Hewitson's collection.

British Museum: *March*, 1884.

THE BRITISH DRAGON-FLIES ANNOTATED.

BY ROBERT McLACHLAN, F.R.S., &c.

In the "Catalogue of British *Neuroptera*," published by the Entomological Society of London in 1870, were enumerated 46 species of British Dragon-flies (*Odonata*). That list was practically based upon Dr. Hagen's "Synopsis," published in the "Entomologist's Annual" for 1857, with the addition of one species (*Leucorrhinia pectoralis*), and the subtraction of another (*Somatochlora metallica*). The number remains at 46*—*Somatochlora metallica* has been discovered in Scotland, whereas *Sympetrum vulgatum* and *striolatum* are united as representing only one species. But the claims of some species to be considered "British" rest on very slender grounds; in one or two cases on single specimens captured 70 or 80 years ago. It therefore occurred to me that it might be useful (and perhaps serve as an *impetus* to observers) if a brief annotated list of our species were drawn up; an idea that has resulted in the following notes.

* A writer in the "Midland Naturalist" for 1882 estimates the number of known *British* species at about 200!!

Some slight discrepancies in generic (or "sub-generic") nomenclature, and in sequence, between these notes and the Catalogue of 1870, result from changes made since that time.

The nomenclature of the older British authors (Curtis, Stephens, Evans, &c.) was very defective, and no sound basis was obtained until De Selys-Longchamps published his Revision of our species (from personal inspection of types) in the "Annals and Magazine of Natural History," ser. i, xviii, pp. 217—227, 1846 (reprinted in abstract in the "Zoologist" for 1846, pp. 1522, 23). Dr. Hagen's Synopsis of 1857 was to some extent founded on those notes, and also on personal observation. Forty-six species were enumerated in 1846, and now, after nearly 40 years, we are not able to increase the number, and, in fact, some species should perhaps be omitted from the List.

Really very little has been done of late, and the only important *local* list published since 1870 is that by the late Henry Doubleday on the species of the Epping district (*cf.* Ent. Mo. Mag., viii, pp. 86, 87, 1871).*

Sub-Fam. LIBELLULINA.

Leucorrhinia pectoralis, Charp.—At the Meeting of the Entomological Society of London, held on January 2nd, 1860 (*cf.* Proc. Ent. Soc., n.s., v, p. 89) Mr. Groves exhibited a specimen of this insect taken in June near Sheerness. On the authority of this example (seen by Dr. Hagen, but now destroyed) the name has found its way into the British list. I believe the specimen was taken on board a fishing boat (at the mouth of the Thames). The species can only be regarded as "casual."

Leucorrhinia dubia, V. d. L.—Certainly common on some of the extensive moors of the north of England. I have never seen a southern example; but, according to Curtis, Mr. J. C. Dale found it in abundance near Dorchester, and he also recorded it from Lincolnshire. Mr. Doubleday recorded it from Epping.

Sympetrum vulgatum, L. (*striolatum*, Chp.).—I am quite of the opinion now held by De Selys-Longchamps, that *vulgatum* and *striolatum* are specifically identical, the usual exponents of the former being represented by very adult examples, the supposed difference in the "vulvar scale" of the ♀ being illusory. The name "*striolatum*" should be suppressed as other than a synonym. This species, in point of numbers and distribution, is perhaps the most common British Dragon-fly.

Sympetrum meridionale, Selys.—I have not examined an example of this species supposed to have been taken in Britain. Two such examples appear to have been recorded, both females, one in Evans' collection (which is in Dale's) from "near London," and the other in Wailes' collection, from the "South of England." If "British," it can, at the most, only be considered a "casual." It is a very abundant species in the Alps of Central Europe, ascending to great elevations, but probably

* Mr. Bond possesses a fair representative old collection, for the most part formed by the late Mr. Farr. Through his courtesy I recently had the opportunity of examining it, but found therein none of what may be termed the "critical" British species.

does not *breed* there. Its liability to have the well known red *Acari* attached to the wings (sometimes in enormous numbers) is so marked as to be almost a specific character of the insect itself, few specimens being entirely free from them.

Sympetrum Fonscolombii, Selys.—Another “casual.” A ♀ was detected by De Selys in Stephens’ collection, and therefore appears to have acquired the usual “near London” as a locality. A ♂ (erroneously recorded by me as *S. vulgatum*, cf. Ent. Mo. Mag., v, p. 220) is in my collection, obtained at the sale of T. Desvignes’ collection, and of the precise origin of which I know nothing. Of very wide southern distribution, extending to South Africa.

Sympetrum flareolum, L.—Local and “sporadic.” In the year 1871 it was excessively abundant in the London District (I even saw several examples in the Strand!).

Sympetrum sanguineum, Müller.—No doubt a common species (perhaps also “sporadic”) in certain districts. I have never seen it *alive* in Britain!

Sympetrum scoticum, Donovan.—A frequenter of moors, and no doubt more common in the north.

Platetrum depressum, L.—Needs no comment.

Libellula quadrimaculata, L.—Abundant in certain localities, general in certain years. I am not aware that anything approaching the enormous migratory swarms that often astonish our continental neighbours has ever been observed in Britain; the tendency is, however, manifested here in the unequal and uncertain distribution.

Libellula fulva, Müller.—Possibly general in the southern portion of England, never common, and always difficult to capture on account of its habits. I have never noticed a British ♂ in the thoroughly “blue” condition seen in very adult continental examples, and which gives them a so entirely distinct appearance.

Orthetrum cærulescens, F.—Needs no comment.

Orthetrum cancellatum, L.—Possibly confined to the southern half of England. Often common about brick-holes in the London district.

Sub-Fam. CORDULIINA.

Somatoclora metallica, V. d. L.—In 1869, Dr. Buchanan White took this species in some numbers in Inverness-shire (cf. Ent. Mo. Mag., vii, p. 38); it has since been taken in the same county by Mr. King. The name was previously in our lists, but no doubt erroneously. Van der Linden misquoted a figure in Harris as representing *metallica*, whereas, in all probability, it was intended for *Cord. anea*, as stated by Harris. Stephens says, “it has been found within the metropolitan district in June;” I know not what has become of the specimen said to have been in his cabinet, and from which Evans’ very uncertain figure was taken; probably there was an error in identification.

Somatoclora arctica, Zett.—The Highlands of Scotland (has also been recorded from Killarney in Ireland). It was not uncommon during my visit to Rannoch in June, 1865 (cf. Ent. Mo. Mag., ii, p. 118), but since that time other visitors to the locality do not appear to have succeeded in finding it.

Cordulia anea, L.—Local in the southern counties of England.

Oxygastra curtisii, Dale.—A species which, from its continental distribution,

should scarcely occur in Britain. The older entomologists used to find it in Dorset, Hants, and Devon. Then it was lost sight of until Mr. Herbert Goss took it in some numbers near Christchurch in 1878 (*cf.* Ent. Mo. Mag., xv, p. 92).

Sub-Fam. GOMPHINA.

Onychogomphus forcipatus, L.—A “casual” at the most. Rests as British on the authority of a ♀ in Stephens’ collection, and that entomologist assured De Selys that he remembered to have taken it in England. Stephens originally confused *forcipatus* and *vulgatissimus*.

Gomphus vulgatissimus, L.—Local in the south. A common Thames insect.

Gomphus flavipes, Charp.—A “casual.” Rests as British on a ♂ captured by Stephens near Hastings on the 5th August, 1818.

Cordulegaster annulatus, Latr.—Needs no comment.

Sub-Fam. ÆSCHININA.

Anax formosus, V. d. Lind.—Common in the south; how far it extends northward I know not.

Æschna mixta, Latr.—Probably widely distributed, but certainly rare. A few years ago Mr. S. Stevens found an example in a torpid condition in his garden near London, in the month of November.

Æschna borealis, Zett.—Highlands of Scotland. Few specimens exist in collections. I observed it, but not commonly, at Rannoch in June, 1865 (*cf.* Ent. Mo. Mag., ii, p. 117).

Æschna juncea, L.—Certainly rare (even if it occur at all) in the south; common in the north, and probably also common in Ireland.

Æschna cyanea, Müller, and *Æsch. grandis*, L.—Need no comment.

Æschna rufescens, V. d. Lind.—Used to be common near Yarmouth, but there seems to be an idea that it has disappeared. Some of the resident entomologists in that vicinity can no doubt solve this question. I have seen no recent British examples.

Brachytron pratense, Müller.—Probably generally distributed, but precise local information is desirable.

Sub-Fam. CALOPTERYGINA.

Calopteryx Virgo, L., and *C. splendens*, Harris.—Need no comment.

Sub-Fam. AGRIONINA.

Lestes viridis, V. d. Lind.—A very doubtful native. According to De Selys, a specimen existed in Evans’ collection. That collection passed into the hands of the late J. C. Dale, and his son (Mr. C. W. Dale) cannot now trace it.

Lestes nymphæ, Selys.—I have never seen a *living* British example, but it certainly used to occur (and probably still occurs) in the Fen District, and Doubleday recorded it from Epping.

Lestes sponsa, Hans.—Probably generally distributed.

Lestes virens, Charp.—I regard this somewhat doubtful as British. One ex-

ample (said to have been taken in the New Forest) was in Stephens' collection (now in the British Museum); a second was recorded from Leach's collection. Doubleday recorded it from Epping.

Lestes barbara, F.—Still more doubtful. According to De Selys (1846) a ♂ in the Dublin Museum was believed to have been taken in Ireland.

Platynemis pennipes, Pallas.—Needs no comment.

Ischnura pumilio, V. d. Lind.—I have seen no recent British examples. Used to be taken not uncommonly in Dorset by J. C. Dale. Recorded also from Cambridge and Belfast. Parfitt recorded it (Transactions of the Devonshire Association, 1879) as common near Exeter, but upon enquiry I found he had made a wrong identification. It is a species of somewhat meridional distribution, but is also alpine. I found several examples close to the St. Gothard Hospice, therefore at an elevation of about 6500 feet.

Ischnura elegans, V. d. Lind.—Needs no comment.

Enallagma cyathigerum, Charp.—Needs no comment.

Agrion pulchellum, V. d. Lind.—Local, but probably generally distributed.

Agrion puella, L.—Needs no comment.

Agrion mercuriale, Charp.—Probably not uncommon in the New Forest. I once found it there in some abundance, but did not succeed in refinding it on the occasion of two flying visits.

Pyrrhosoma minimum, Harris.—Needs no comment.

Pyrrhosoma tenellum, Villers.—This essentially South European insect is very abundant on some of the extensive heaths of the south of England.

Erythromma najas, Hans.—Local in the south of England. Also recorded from Belfast.

Of the foregoing 46 species, I regard eight as only *casual visitors or otherwise doubtful*. There is no evidence whatever that *Leucorrhinia pectoralis*, *Sympetrum meridionale* and *Fonscolombii*, *Onychogomphus forcipatus*, and *Gomphus flavipes*, breed in Britain. There is the strongest evidence that two or three of these were casual immigrants, and the origin of the specimens on which others are included in our list cannot be traced. With regard to *Lestes viridis*, *virens*, and *barbara*, the case is slightly different. These insects could scarcely fly over, and everything depends upon the authenticity, as British, of the examples upon which the species have been included. In placing *L. virens* in this category, I am aware that a doubt is cast upon the late Henry Doubleday's discrimination, owing solely to the great difficulty that often attends the determination of the species of *Lestes*. I never saw Mr. Doubleday's Dragon-flies, and it is possible that had I seen them in 1871, I might then have arrived at no satisfactory conclusion with regard to *L. virens*.

In Mr. Doubleday's Epping list he alluded to having seen a

"*Cordulia*" with yellow dorsal markings on the abdomen, which he believed was *O. Curtisii*. A doubt as to whether this might not have been *Somatochlora flavomaculata*, V. d. Lind., has always existed with me. The latter is a species that certainly *should* occur in Britain.

Allusion should not be omitted concerning the somewhat notorious "*Libellula Sparshalli*, Dale, MS.," that found its way into the earlier British lists. Curtis says, "Taken at Horning in 1823 by the late Mr. J. Sparshall; it is very similar to a Chinese species." This has long been known to be identical with the nearly cosmopolitan *Pantala flavescens*, F. (with a multitude of synonyms). If any reliance whatever could be placed upon the supposed origin of the example, another species could be added to the *European* list (only about 102 species), for Europe is the only quarter of the globe in which *P. flavescens* has *not* been noticed. Its occurrence in Britain would be extraordinary, but that it may occasionally extend (as a "casual") to the south of Europe seems not at all impossible, when we consider its distribution in Africa and Asia.

England possesses two Dragon-flies (*Oxygastra Curtisii* and *Pyrrosoma tenellum*) that are of South European distribution, and which should *not* occur. On the other hand, if we compare our list with that of the species found in Belgium, Holland, and Scandinavia, there are several that *should* occur, not as "casuals," but as residents. No one seems able to find these, and at present the British Dragon-flies appear likely to go the way of the British Butterflies—on a *descending* scale.

Lewisham, London :
26th January, 1884.

Additions to the entomology of the Isle of Harris.—In the Ent. Mo. Mag., vol. xix, p. 237, I gave you a list of the insects taken by me in the Isle of Harris. To these I may add the following, taken by myself on July 29th, on my way from St. Kilda:—*Satyrus Janira*, of this species I took a remarkable female, with the fulvous band continued across the hind-wings: the males have darker under-sides than usual; *Lycæna Alexis*, of usual type; *Noctua xanthographa*, dark; *Boarmia repandata*, var.; *Melanippe fluctuata*, dark; *Hypsipetes elutata*, small and dark, as are most of the following: *Larentia casiata* and *pectinitaria*; *Emmelesia albulata* and *blandiata*; *Campptogramma bilineata*; *Melanthia ocellata*; *Anaitis plagiata*; *Scopula fuscalis*; *Eudorea atomalis*; *Plutella annulatella*; *Hæmatopota pluvialis*; *Tetanocera umbrarum*; *Halictus villosulus*; *Creophilus maxillosus*, var. *ciliaris*; *Sisyra fuscata*; *Psychomyia phæopa*; *Cyrnus trimaculatus*; *Hydroptila sparsa*; *Berœa pullata*; *Wormaldia occipitalis*; *Leptocerus bifasciatus*; *Limnophilus extricatus* and *luridus*. I must not forget to mention, it was a fine, bright, and beautiful day, very different to the usual Scotch weather.—C. W. DALE, Glanvilles Wootton: February 1st, 1884.

Captures in the Isle of Skye.—After leaving Harris, I spent three days at Dunvegan, Sligachan Inn, and Portree, and took : *Pieris rapæ*, *Argynnis Aglaia*, *Chortobius pamphilus*, *Cidaria russata*, *Metrocampa margaritata*, *Eupithecia lariceata*, *Boarmia repandata*, large and fine, *Larentia cæsiata*, *Abraxas grossulariata*, *Tortrix viburnana*, *Mixodia Schulziana*, *Aphelia pratana*, *Sericoris lacunana*, *Pardia tripunctana*, *Eupæcilia angustana*, *Crambus ericellus* and *culmellus*, *Lepidocera hison-tella*, *Pleurota bicostella*, *Pterophorus tephrodactylus*, *Phryganea obsoleta*, *Hemerobius humuli*, and *Vespa arborea*. I was quite pleased at seeing grasshoppers and other insects, which apparently do not exist in the outer Hebrides.—ID.

Botys urticata in January.—The account in this month's Magazine of the abnormal advent of *Botys urticata* reminds me of a similar adventure with an individual of the same species that befel me in or near the year 1856. It was in the kitchen of a country house near Worcester, on the 27th of January, after dark : a snow storm prevailed at the time, and the wind was bringing smoke and snow down the chimney, in the direction of which I was looking, when, with one of the gusts came down into the room a recently-emerged and scarcely expanded specimen of *Botys urticata*. The creature was preserved, and, with its somewhat crumpled wings, remained in my collection several years.—J. E. FLETCHER, Happy Land, Worcester: *March 5th*, 1884.

Botys urticata in February.—I had read but a line or two of the notice at page 227, in this month's Ent. Mo. Mag., when I ventured to guess there would be in the kitchen some sage or other herb belonging to the Labiate family ; and that the full-fed larva of *Botys urticata* in its cocoon, having been brought in with these leaves, had, by a rare chance, been forced by the warmth to transform, and produce the moth thus early, instead of drying up, as would almost sure to be the case, if one tried such an experiment. The larva is well known to feed on a variety of plants besides common nettle, spinning its cocoon in the autumn, and remaining unchanged through the winter, like so many others of the group. I have bred the moth at the usual time, by keeping the cocoons in cages out of doors, having often found the larvæ on some plants of horehound (*Marrubium vulgare*) which are growing freely in my little town-garden. These plants are sometimes cut in the autumn, and hung up to dry in the house for use as a domestic medicine during the winter : so, possibly, a similar experience to the one recorded may come under our observation some mild winter's day.—W. R. JEFFREY, Ashford, Kent: *March 11th*, 1884.

Botys urticata frequenting mint.—My earliest acquaintance with *Botys urticata* dates from nearly 50 years ago, and I well remember my boyish delight on starting this pretty insect from a bed of mint in my father's garden. I probably saw half-a-dozen specimens, but struck at them so wildly in those days, that I doubt whether I boxed more than one or two.

I used, however, to revisit this mint-bed again and again, and, during the season, rarely failed to meet with one or more of this brightly contrasted species. Hence, it is always associated in my mind with culinary herbs.—H. T. STAINTON, Mountsfield, Lewisham, S.E. : *March 13th*, 1884.

Notes on Lepidoptera in Roxburghshire in 1883.—The season of 1883 was not in this district a prolific one in *Lepidoptera*, either in the larval or perfect state. There were, however, as seems always the case, a few particular species in as great force as usual, and in one or two instances, notably, *Eupithecia indigata* and *pygmæata* were even more numerous than I have seen them. *Noctuæ*, during the summer and autumn months, were in small numbers. I again took *Tryphæna subsequa* in fine condition, also *Noctua festiva*, *Dianthæcia capsicola*, and *Cucullia umbratica*, not having seen the latter for some years; and, in the beginning of August, when trying the effect of light at my bedroom window, using the mirror as a reflector, I was agreeably surprised by a fine specimen of *Plusia bractea* coming in and settling on the window-blind, its two burnished spots shining with gem-like brilliancy in the reflected light. I need not say I at once closed down the window and so made an easy capture. I took *Corcmia munitata* in the beginning of August, in fresh condition, in one of the wildest parts of the Cheviot range; apparently a second brood. Among the *Micros*, I took the following, viz.: *Scoparia pyralella* and *murana*, *Eupæcilia atricapitana*, *Argyresthia retinella*, *Gædarella*, and *arceuthina*, *Cedestis farinatella*, *Coleophora albicosta* and *artemisiella*, *Elachista apicipunctella* and *atricomella*.—A. ELLIOT, Samieston, Jedburgh, N.B.: Feb. 21st, 1884.

Instinct of locality in Lepidoptera.—In the month of July last, when passing alongside a wire fence, and when near its termination, I noticed on one of the posts, just at the point where the top wire is stapled in, a specimen of *Xylophasia polyodon* settled, and as it seemed a fine and peculiarly shaded one, I boxed it, but after bringing it home, allowed it to escape. Having occasion to pass the same fence a few days afterwards, I again noticed in my belief the same specimen settled, not only on the same post, but on the exact spot as formerly, close to the staple of the upper wire. I think it would be interesting to hear of any similar experience; at any rate, it may serve as a suggestion to make trial of this instinct, as I have not hitherto heard of a similar instance.—ID.

Importation of Ephestia passulella and E. ficulella at King's Lynn.—On February 6th, I was informed that numbers of small moths were flying about the Schooner "Ellen Holt," of Grimsby, which had just put into our dock with a cargo of decorticated cotton-cake from Galveston, United States (Texas). A few of the moths were also brought me on the same day, and I at once thought them to be *E. passulella*, but, subsequently, noticing that they varied considerably, a few of them were sent to Mr. C. G. Barrett, from whom I learn that there are two species, viz., *E. ficulella* and *E. passulella*. On the 7th, the day after the arrival of the vessel here, I paid it a visit with the view of finding out how far the statements made to me about these moths were true: the moths were there, and not in hundreds only, but in thousands. From a fair amount of questions put to the crew, I obtained the following information:—"That when the vessel left Galveston, having been 63 days on her voyage here, no moths were noticed amongst the cargo or any part of the ship; that whilst traversing the Atlantic a severe gale was encountered, and water found its way to the hold, thereby wetting the cargo and causing it to heat; that upon arrival here the hatchways were opened, when a cloud of these moths immediately flew out, settling on everything and everybody near."

As the process of unlading was being proceeded with whilst I was on board, the opportunity thus afforded me for watching the insects was turned to account. The cotton-cake was packed in bags, and as these were removed, numbers of the moths continually flew through the hatchways into the open air. They did not fly far, but settled down on various objects, or on the deck, apparently not appreciating the difference of temperature—for it was cold outside as opposed to the unnatural and abnormal heat of the hold; at any rate, they appeared in a very short time to become benumbed, and lying on their backs, showed, even when touched, scarcely any signs of life. There is not much doubt that the heat to which I have alluded—which would for the most part be generated by the wet cargo—had caused the moths to emerge from their pupæ much earlier than they would have done under ordinary circumstances. Upon examining the bags, I found them to be covered with cocoons, most of which were empty; I have also since been informed that “white maggots” (by which I presume larvæ are meant) had been observed on the outside of the bags as they were being stowed away in the warehouses, and a closer examination has shown that larvæ were at work amongst the cake inside the bags, and I think there can be little doubt that these larvæ were those of the two species which form the subject of these lines. The cargo has been deposited in two warehouses, about half a mile distant from each other, and as I understand that the cotton-cake is not likely to be disposed of for some few months, both *E. passulella* and *E. ficulella* will probably have good opportunities for obtaining a sound footing here. Two years ago, the former species (*E. passulella*) was plentiful in and about the dock Company’s warehouses, where it had doubtless been introduced; but last year, although a sharp look out was kept for it, I could find no trace of the species. I suppose the cake, or whatever the larvæ might be feeding upon at the time, was removed from the district, and that consequently *E. passulella* disappeared, or at the least, became scarce.—EDWD. A. ATMORE, 3, Haylett Terrace, Exton’s Road, Lynn: February 21st, 1884.

Blatta americana.—Amongst the cargo of cotton-cake recently imported from America to which I have just alluded, were observed numbers of *Blatta americana* (American cockroach) in various stages of development; some of them were very small, others had reached the full size, but were yet of a whitish colour, whilst not a few had assumed the characteristic reddish colour of the fully developed insect, and were exceedingly active. I believe I am right in stating that this insect is far more destructive in America than the common and familiar *B. orientalis* is in this country; but although introduced here in such plenty, I consider it probable that our climate will prove unsuitable, as it has done hitherto, for the increase or naturalization of this pest.—ID.

Tortrices, &c., in South Wales and Sutherlandshire.—In the autumn of 1880, I spent a few weeks in the neighbourhood of Brecon, and collected a few moths there, including *Camptogramma fluviata*, *Crambús falsellus*, *Peronea perplexana*, and *Ephippiphora tetragonana*. *Peronea sponsana* (*favillaceana*, of Stainton) was abundant in the hornbeam hedges, even where no beech could be found, and it seems not impossible that its larva may feed on hornbeam occasionally. I have never found it, however, among hornbeam in this neighbourhood, although our hedges are

largely composed of that tree. Mr. Barrett informs me that, according to Zeller, the larva is sometimes found on dewberry, as well as on mountain ash, while Heine-mann gives oak as a food-plant.

In June, 1881, while fishing in Sutherlandshire, I took a few *Tortrices*, including *Penthina praelongana*, *Grevillana*, and *marginana*, *Clepsia rusticana* (abundantly), *Coccyx tædana*, *Phoxopteryx uncana*, *biarcuana*, and *inornatana* (*subarcuana*, of Stainton), *Argyrolepis Baumanniana* and *subbaumanniana*. The *Hypermezia angustana* seemed very distinct from our southern forms of *H. cruciana*, with very evident, well-defined, dark markings. *Phoxopteryx inornatana* scarcely answers to its name in that locality, being of a rich fawn-colour, with the median streak well-defined and very distinct; in fact, the insect looks at first sight almost like *biarcuana*. *Pædisca semifuscana*, bred from sallow, varied but little. On the other hand, *P. Solandriana*, bred from birch, varied considerably, most of them being of a brilliant orange-red ground-colour, none, however, shewing either a dark or a white blotch along the inner margin. I obtained a single specimen only of *Tortrix ministrana*, which, however, is a very dark richly marked example. *Eupæcilia ciliella* varied from the fine, richly-marked, Scotch form (*subroseana*, of Stainton) to small obscure specimens like our cowslip-bred form. The variety of *G. ulicetana*, with the white or whitish ground-colour, was not uncommon, feeding apparently on various trefoils as well as gorse. Among the *Tineæ*, *Nemophora pilella*, very bright *Tinea rusticella*, *Geophora subaquileæ*, *Ornix scoticella* and *Loganella*, appeared to be fairly common. Of *P. Grevillana* I took but one example, and am unable to give any exact particulars with regard to it, as, on catching it, I did not distinguish it from *P. praelongana*. I do not think it can be at all common, as I took every *Penthina* that I saw.—A. F. GRIFFITH, Sandridge, St. Albans: March, 1884.

The late Mr. Buckler's drawings of the larvæ of British Macro-Lepidoptera.—

We are glad to be able to announce that the Ray Society has acquired these drawings, and the voluminous MSS. in connection therewith, for publication, and the Rev. J. Hellins has kindly lent those of Mr. Buckler's drawings in his possession to the Society. They will probably form the subject for three or four volumes of the Society's publications, but at present the scheme has not been sufficiently developed. In the meantime, those entomologists (not already members of the Ray Society) who wish to obtain these volumes, would do well by sending in their names and addresses to the Secretary—the Rev. T. Wiltshire, 25, Granville Park, Lewisham, London, S.E. By so doing, they would materially aid the Council of the Society.—EDS.

The late Mr. Harper's collection of British Lepidoptera.—The sale of this collection at Stevens' rooms on the 20th and 21st March, attracted about the largest assemblage of British Lepidopterists we ever remember to have seen in these rooms. The collection was a remarkable one, perhaps the most remarkable ever dispersed, and the prices realized were in proportion. The late Mr. Harper did not appear to have considered it necessary to label his insects in any way whatever, even by names: it seemed to him to suffice if he possessed the specimens. The collection was extraordinarily rich in bizarre varieties, in the rarer British species, and in those strange forms from the Hebrides, Shetlands, and other outlying Scotch

islands, that have attracted so much attention of late; and it is a great pity these latter had to be dispersed before being worked out in comparison with the forms existing in the extreme north of continental Europe and northern Asia. The entire collection of *Macro-Lepidoptera* realized about £900. A brief analysis as to some of the more remarkable points here follows:—The butterflies alone realized £264; a lot of seven *Papilio Machaon*, including an extraordinary variety, brought £4 5s.; the series of *Colias Edusa* and vars. over £17; 4 vars. of *Vanessa Io*, £4 10s.; 20 *Lycæna dispar*, £28 10s.; 1 example of *Trochilium vespiforme*, £3 5s.; 1 of *T. allantiforme*, £3; the series of *Arctia cæja*, nearly £90 (!); 11 of *Spilosoma lubripeda*, var. *radiata*, £8; varieties of *Odonestis potatoria*, £5 9s.; the unique example of *Nyssia lapponaria* (cf. Ent. Mo. Mag., vii, p. 282), £13 13s. (Meek); the series of extraordinary vars. of *Abraxas grossulariata*, £105 (!); *Synia musculosa*, about 12/- each; *Nonagria concolor*, £2; fine vars. of *Crymodes exulis*, about 24/- each; *Hydrilla palustris*, £1 each; *Noctua subrosea*, about £1 each, on an average; *Hadena satura*, £2 9s. for two; *H. peregrina*, one guinea each; *Heliothis scutosa*, £3; *Catocala electra*, 5 guineas (!); *Ophiodes lunaris*, £2 10s.; and so on in proportion. We understand that the *Micro-Lepidoptera* will not be disposed of until the beginning of May.

Review.

HEMIPTERA GYMNOCERATA EUROPÆ.—HÉMIPTÈRES GYMNOCÉRATES D'EUROPE, DU BASSIN DE LA MÉDITERRANÉE ET DE L'ASIE RUSSE: décrites par O. M. REUTER. Troisième Tome. Avec 5 Planches. pp. 317—568, 4to. Helsingfors, 1883. (Extrait des "Acta Societatis Scientiarum Fennicæ, Tomus xiv").

This volume, dedicated in a few graceful words to Dr. Victor Signoret, contains a continuation of descriptions of the *Capsidæ*, to which Family of *Hemiptera* the two previous volumes were devoted (cf. Ent. Mo. Mag., xv, 19, and xvi, 214), embracing the genera and species comprised in the Divisions *Nasocoraria*, Reut., *Cyllocoraria*, Reut.; *Dicypharia*, Reut. (pp. 317—438); Addenda et Corrigenda to Vols. 1, 2 and 3 (pp. 439—477); Explanation of the figures in Plates 1 and 5 of this volume (pp. 478—480); Systematic Index of the species described (pp. 481—484); Alphabetical Index to Vols. 1—3 (pp. 485—496); Supplement to Vols. 1—3, Synopsis of genera and species (pp. 497—563); Appendix, Arrangement of the Divisions of the *Capsidæ* (pp. 564—568).

Some new genera and species are described; on the other hand, many hitherto assumed species have been deposed and relegated to the position of synonyms. As might have been expected, when genera are instituted on such fine-drawn lines as are now or have been previously laid down, many already known species have been removed from genera in which they had been located—sometimes but recently, and either referred to other existing genera, or, when they could not go through their Caudine Forks, have been passed under the yoke of new genera. It is appalling even to think of the mass of generic characterizations, under names that give no clue to their relative connection, that will have to be mastered if the *Hemiptera* of the whole world be treated in this centrifugal fashion; for, after all, genera are but idealisms. But on the plan adopted the discrimination and description of the species are admirably done. The mere technical toil of reference and compilation must

have been immense, and nothing but an intense love of his subject and untiring perseverance could have enabled the author to do so much and so well. But few if any other persons exist who possess at once the materials, time, perception of affinities, general ability, and inclination to do such work, and the recipients of the result cannot be too grateful for the boon conferred upon them. The plates are excellently engraved by Debray of Paris, from the drawings of Fieber and the author.

The author hopes to be able to publish the fourth volume before the end of this year, and in order to make it as complete as possible, he requests the loan of specimens of any of the species with which he has yet to deal, and to be furnished with any information respecting them. He particularly indicates as unknown to him: *Stiphrosoma bicolor*, Germ., *nigritarse*, Costa, *Halticus puncticollis*, Fieb., *consimilis*, Jakovl., *Orthocephalus stygialis*, Muls. & Rey, *funestus*, Jakovl., *tristis*, Fieb., *nebulosus*, Fieb., *alutaceus*, Fieb., *Pachytoma punctigera*, Horv., *rugicollis*, Jakov., *nigrita*, Jakov., *longicornis*, Jakov., *Euryopocoris Reuteri*, Jakov., *Camptotylus aphidioidis*, Jakov.; and any examples of these which may be entrusted to him he engages shall be returned as soon as possible.

ENTOMOLOGICAL SOCIETY OF LONDON: 3rd October, 1883.—R. McLACHLAN, Esq., F.R.S., &c., Vice-President, in the Chair.

J. H. Durrant, Esq., of Hitchin, and G. W. Oldfield, Esq., were elected Members.

Mr. Pascoe exhibited sundry uncommon British *Hemiptera*, including *Ledra aurita* L., *Nabis brevipennis*, Hahn, and *Aræopus pulchellus*, Curtis.

Mr. Theod. Wood exhibited a specimen of a *Malthodes* from Dulwich, probably new.

Mr. Wailly exhibited several species of exotic *Saturniæ* and other silk-producing Bombyces, bred by him in this country. One of the most notable was a *Samia* allied to *S. Cecropia*, and possibly a hybrid between it and some other (unknown) species.

Mr. Kirby exhibited examples of a *Zygæna* captured by Mr. Prest near York, and which the latter thought might be *Z. meliloti*. The general opinion of the Meeting appeared to be in favour of their not being distinct from *Z. lonicera*.

Mr. Billups exhibited specimens of *Acidia heraclei*, L. (the celery-fly), which had proved very destructive this season.

Dr. Sharp communicated notes on the nomenclature of certain species of *Batrachus*, embodying changes necessary in consequence of names previously applied by him to new species being already in use.

Mr. Kirby read notes on the *Diptera* of New Zealand, supplementary to Prof. Hutton's Catalogue published in 1881. A discussion on the New Zealand Insect Fauna ensued, in which Messrs. Meyrick, Pascoe, and others took part.

7th November, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

R. J. Attye, Esq., of Stratford-on-Avon, was elected a Member.

Mr. Enock exhibited living examples of *Atypus piceus*, Sulz., which was not uncommon in the neighbourhood of Woking.

Mr. Billups exhibited a large number of interesting British Aculeate *Hymeno-*

ptera and *Ichneumonidæ*, the former from Margate, the latter from Sevenoaks,* &c. Also about 35 species of parasitic *Hymenoptera* bred from the galls of *Cynips Kollari*; several of these were undetermined and probably new.

Mr. C. O. Waterhouse exhibited the specimen of *Phaneroptera falcata*, Scop., captured by Dr. Mason in Cornwall (*cf. ante* p. 186); and a living Dipterous parasite that had emerged from a cocoon of *Megalopye citri*, Sepp, from Brazil.

Mr. H. W. Bates sent a communication, in which he mentioned that his *Bros-cosoma elegans* had been previously described by Von Harold as *Miscodera Donitzi*.

Sir S. S. Saunders exhibited, and remarked on, a species of *Chalcididæ* parasitic on *Blastophaga* in Italian figs, especially in connection with the *Cynips carica* of Hasselquist, and the necessity, or otherwise, for "caprification."

Mr. Distant read the first portion of his projected Memoir on the *Rhynchota* of Japan, chiefly drawn up from materials collected by Mr. Lewis.

Mr. Elwes read further notes on the genus *Colias*.

Mr. Poulton read notes on the protective attitudes assumed by the larvæ of *Sphingidæ* and Saw-flies.

Dr. Leuthner read a description of *Ægognathus Waterhousei*, a new genus and species of *Dorcidæ* from Peru.

Mr. C. O. Waterhouse read a description of *Eurytrachelus picipes*, a new species of *Dorcidæ* from the Solomon Islands.

5th December, 1883.—R. McLACHLAN, Esq., F.R.S., &c., Vice-President, in the Chair.

The Chairman announced the death of Dr. Le Conte, one of the Honorary Members of the Society.

G. B. Buckton, Esq., F.R.S., was elected a Member.

Mr. Pascoe exhibited curious egg-cases of an insect from Delagoa Bay, collected by Mrs. Monteiro, attached by a loop to twigs of a shrub, which Sir J. D. Hooker said was probably one of the *Rhamnaceæ*; they were sub-diaphanous, shining, and yellowish in colour, and about an inch in length, but varying in size, and contained a number of eggs placed in an erect position. Mr. McLachlan and Mr. Wood-Mason remarked on these cases, the former expressing a decided opinion that they pertained to some species of *Mantidæ*, which the latter somewhat doubted.*

Mr. Billups exhibited *Pachylarthrus smaragdinus*, bred from the pupæ of the celery-fly; also certain rare British *Tenthredinidæ*, viz., *Pæcilosoma Fletcheri*, *Tenthredopsis inornata*, and *Tenthredo Lachlaniana*, recently described by Mr. Cameron.

Mr. E. Saunders exhibited *Athous difformis*, Lac., captured at Hastings by Mr. Collett.

Mr. E. A. Fitch said that *Priocnemis Pascoei*, Kirby, from New Zealand, was an Ichneumon, and a variety of *I. lotatorius*, F., the type of which is in the Banksian Collection (now in the British Museum).

A communication was read from the Colonial Office, through the Royal Gardens at Kew, respecting the supposed occurrence of *Phylloxera* in the Colony of Victoria.

Mr. Miskin communicated descriptions of new Australian *Rhopalocera*, chiefly from Queensland.

Mr. Meyrick read a paper on the Classification of Australian *Pyralidina*.

* Mr. Wood-Mason has since acquiesced in this opinion.—R. McL.

16th January, 1884 (ANNUAL MEETING).—J. W. DUNNING, Esq., President, in the Chair. The following were elected Members of Council for 1884, viz.: Messrs. T. R. Billups, J. W. Dunning, E. A. Fitch, F. Grut, W. F. Kirby, G. Lewis, R. McLachlan, J. W. May, R. Meldola, F. P. Pascoe, E. Saunders, J. W. Slater, and Sir S. S. Saunders.

The outgoing President, Treasurer, Secretaries, and Librarian, were re-elected.

The President read an Address, which was ordered to be printed, and the Meeting terminated with the customary votes of thanks, which were acknowledged. It was mentioned in the Report of the Council that the President had presented a complete set of the "Annals and Magazine of Natural History" to the Society.

6th February, 1884.—The President in the Chair.

E. A. Poulton, Esq., M.A., of Jesus and Keble Colleges, Oxford, and S. Prout Newcombe, Esq., of Covent Garden, were elected Members.

The President appointed Messrs. Meldola and Pascoe, and Sir S. S. Saunders, Vice-Presidents for the year.

Mr. Crowley exhibited specimens of *Castnia Eudesmia*, with their "cocoon," or larval galleries, formed of ligneous *débris*, of great length, and frequently furcate; also the eggs, which were of large size: these had been sent from Valparaiso.

Mr. Kirby exhibited a coloured photograph of the abnormal *Samia* bred by Mr. Wailly, and exhibited at the Meeting on the 3rd October, 1883.

Mr. Stainton called attention to the history of *Aglossa pinguinalis*, as detailed by Mr. Buckler in the Ent. Mo. Mag. for February, remarking on its extraordinary habits; he also stated that Mr. Buckler had left notes on the habits of its congener, *A. cuprealis*.

Dr. Sharp sent a photograph of the extraordinary *Hypocephalus armatus*, which species he had recently acquired.

Mr. Pascoe exhibited a fine collection of *Curculionidæ* from New Guinea.

The President stated that he had received information from Mr. Nottidge, of Ashford, that a number of *Bombi* had recently been sent to New Zealand, and he hoped that better success would attend this consignment than those previously sent. They were to be kept at a temperature of about 40° Fahr. Mr. McLachlan and others thought this was too high a temperature. The President also alluded to the apparent scarcity, or disappearance of butterflies in Yorkshire (according to Mr. Porritt's list) as compared with the conditions formerly existing. Mr. Beaumont confirmed the accuracy of the statement, and Mr. Hudd said that a precisely parallel condition existed with respect to Bristol. Messrs. Stainton and Weir added their testimony to the correctness of the statement with regard to other localities.

The report of the Committee (Messrs. McLachlan and Fitch) appointed by the Council to examine into the question of the supposed presence of *Phylloxera* in the Colony of Victoria was read. The insect was present on the roots sent (in alcohol), in considerable numbers, and the matter was the more serious because these roots were those left in the ground after the vines had been destroyed. Precautionary measures were recommended.

Mr. Douglas communicated a paper (accompanied by a plate) on a new species of *Orthezia* from Monte Criso, sent to him by M. Lichtenstein.

Sir S. S. Saunders communicated further notes on "caprification" and fig-insects.

It was announced that the next Meeting would be made special, to consider a requisition (signed in accordance with the Bye-Laws) as to the advisability, or otherwise, of obtaining a Charter for the Society.

NOTES ON *TENTHREDINIDÆ*.

BY P. CAMERON.

(Continued from Vol. xix, p. 135.)

Since the publication, in 1882, of my Mon. Phyto. Hymen., i, I have only been able to record one additional species to those described in it, namely:—

1a. *DOLERUS PRATORUM*.

Tenthredo pratorum, Fall. Acta, 1808, 64, 27.

Tenthredo (Dolerus) equiseti, Klug, Berl. Mag., viii, 298, 225; Htg., Blattw., 233, 9.

Dolerus pratorum, Thoms., Hym. Sc., i, 281, 5.

Black; segments 2—6 of abdomen, and femora, and tibiæ red. *Eyes oblong, inner orbits margined.* 3rd joint of antennæ longer than 4th; tegulæ black, fuscous, or white; labrum white.

Length, 8—9 mm.

Sometimes the clypeus is white, and one specimen (a ♂) has the flagellum reddish.

The oblong eyes readily separate it from the other species with red-belted abdomens, it being the only species of this coloration with oblong eyes.

Taken by Mr. Ed. Saunders at Chobham. It is not, I believe, a common species, and has been only recorded from Sweden, Germany, and France.

Nematus xanthopus, André, Brischke and Zaddach = *Dinura stilata*, Klug. In regard to this, I should mention that the vast majority of the specimens of *D. stilata*, have only one radial cellule, and even with those specimens in which the transverse radial nervure is present it is faint. I have reared a specimen with two radial cellules from larvæ similar to those described by Brischke and Zaddach, under the name of *xanthopus*, have carefully examined it with some types received from Herr Brischke, and have also compared the saws of the two and find them quite identical in all respects.

NEMATUS ORBITALIS, n. sp.

Pallid-green; the head from the base of the antennæ, including the whole of the frontal area, the vertex between the sutures, and the occiput in the middle behind, meso- and metanotum, and a broad continuous band on dorsum of abdomen, black. Antennæ as long as the thorax and abdomen together; black above, brownish beneath; 3rd joint nearly as long as the 4th. Wings hyaline, nervures blackish, costa pale at the base, stigma greenish-white. Vertex finely punctured, sutures deep, an indistinct transverse suture behind the ocelli. Hind tarsi lined with black above,

the apex of posterior tibiæ and the apices of the joints of anterior tarsi black. Spurs acutely pointed, about one-third of the length of metatarsus.

The ♂ has the antennæ longer and thicker; the 3rd joint is shorter than the 4th; the under-side of the body testaceous; the tarsi are darker coloured, and there is a short black line on the posterior femora above; the last abdominal segment keeled in the middle on upper-side.

Length, $2\frac{1}{2}$ lines.

This species comes very close to *N. lacteus*, Thoms., from which it differs in coloration only in the part immediately behind the sutures on vertex being black in both sexes, while with *lacteus*, the head is completely black behind, except perhaps at the extreme edge. Otherwise, *orbitalis* differs from *lacteus* in having the front and vertex punctured, the antennæ, if anything, longer and lighter coloured, the clypeus not so deeply incised, the recurrent nervure in hind-wings is not interstitial; and, lastly, the saw is very much narrower, and differently toothed.

The ♂ differs from the same sex in *lacteus*, in having the antennæ longer, these being longer than the body, they are more densely pilose, more slender, the last segment of abdomen is more distinctly keeled above and beneath; it is much broader at the apex, not being brought to a point in the centre. In coloration it differs in having only a longitudinal black mark under the wings, while the entire mesothorax in *lacteus* is black. So far as I know, this is the only species of the green section which has not the head entirely black behind.

Rare. Cadder Wilderness; Ballantrae, Ayrshire; Germany. The larva feeds on willow.

NEMATUS SYLVESTRIS, *n. sp.*

Green; the vertex between the ocelli, a line in centre of middle lobe of mesonotum at the base touching the pronotum, a longer line on inner side reaching from near the pronotum to the scutellum; a small round mark on either side of these at apex, a larger mark outside of scutellum; a curved line in front of each of the cenchri; and two or three narrow transverse marks at base of abdomen; black. Antennæ as long as the body, a thin black line on upper surface; 3rd joint shorter than 4th, longer than the long diameter of the eye. Wings clear hyaline. Apices of tarsal joints fuscous. Cerci short, thick.

The ♂ has the antennæ as long as the body, densely covered with a close pile, the 3rd joint a little curved; blackish above, testaceous beneath. Vertex broadly black, behind black, except at edges. Body greenish-testaceous beneath, meso- and metanotum and abdomen above, except at extreme apex, and at the sides of the apical segments, black. Apical segment of abdomen transverse at apex above; rounded beneath, with the edges incised. There is a short blunt keel above, which does not reach to the apex, and with a depression on either side of it. Stigma griseous-testaceous. The sides of scutellum are obscure testaceous.

Length, $2\frac{3}{4}$ lines.

The species is exceedingly like *M. miliaris*, and I am not sure if the ♀ can be distinguished from the ♀ of that species; the ♂, however, may be known from *miliaris*, ♂, by the keel on the last abdominal segment being much shorter, not being much longer than broad, and not reaching to the apex; in *miliaris*, on the other hand, it projects beyond the apex, which is thus not transverse; the black on the vertex, too, is broader, but behind it is not quite so broad, the edges being testaceous.

The larva feeds on *Salix caprea*, in August and September, feeding either along the edge, or in the centre of the leaf. Its head is green, with a faint yellowish tinge; there is a brownish stripe on either side going down from the vertex to the eyes: another line goes down to the centre of face to the middle, the top is mottled with light brown dots. Body deep green; legs glassy-green; the skin is much wrinkled, and at the side the wrinkles form oblong raised objects, which are edged with black. Over the eye is a black line, the entire body is covered with blackish irregular lines, which give the skin a mottled appearance, the back is also more or less covered with these lines; the centre, however, being much lighter in tint.

The single cocoon is spun in the earth, the flies emerging in the following summer.

The larva of *N. miliaris* differs in not having the body mottled with black, and in having a distinct black lateral line, *sylvestris* not having one.

Glasgow: April, 1884.

NOTES ON BRITISH *TORTRICES*.

BY CHAS. G. BARRETT.

(Continued from page 244)

Pædisca corticana, W. V.—Larva half an inch long, cylindrical, rather sluggish, dull pale yellowish-brown or bone-colour, rather darker towards the head, and having a conspicuous, square, reddish-brown, internal blotch on the ninth segment. Spots small, black, hairs rather long, head light shining brown, plates bone-colour, feet black.

Living in a rolled oak-leaf, often connected with other leaves, and sometimes with one of the soft leaf-galls of the oak or oak-apples, in which it makes tunnels. When full-grown, making a smaller chamber by drawing together a corner of oak-leaf within the rolled portion, and finally becoming a pupa in the same place. Feeding in June and

emerging in July. Zeller's description agrees closely, but it is quoted twice in Hofmann's "*Kleinschmetterlingsraupen*," on p. 58, correctly, for this species, and on p. 41, for *Penthina corticana* = *picana*.

Pædisca profundana, W. V.—Larva active, cylindrical, but rather tapering at each end, and with well-divided segments. Shining dark green or bottle-green, with faintly marked black dots and strong hairs, head pale horn-colour, plates of the colour of the body.

In rolled-up oak-leaves, feeding through June and emerging late in July and in August. Zeller says feeding also on *Prunus padus*. He describes the larva—probably younger—as having the spots large and the head and dorsal plate shining black.

Pædisca occultana, Dougl.—Larva resembling that of a *Sciaphila*, sluggish, nearly cylindrical, but with the anal segments rather attenuated. Slate-grey, with the segmental divisions paler, spots large, black, and very prominent. Head flat and rather broad, jet black, as also are the plates and feet.

Found feeding on larch on the Yorkshire moors in June by Mr. Eedle, and sent by Lord Walsingham. Pupa light brown. Moth emerging in July and August.

Baron von Noleken records rearing this species (under the name of *pinicolana*) from silver fir, *Pinus picea*.

Pædisca ophthalmicana, Hüb.—Larva short, thick, and wrinkled with swollen segments. Dirty greenish-white, spots olive-grey, prominent, head shining black, dorsal plate olive-brown with a white collar, last two segments retracted, anal plate light brown. This larva was sent by Mr. J. B. Hodgkinson, of Preston. It fed in June on aspen, rolling up the leaf and eating the substance of the upper skin. It died after forming a tough cocoon of whitish silk, but others were said to have been reared.

This larva is described by Treitschke as "greenish-white, with small grey raised dots. Head and dorsal plate shining black, anal plate grey, belly whitish. In May, in rolled leaves of *Populus tremula*. Pupating in an earth-cocoon, pupa light brown." This description is evidently from a younger larva than I have seen.

Pædisca Solandriana, L.—Larva sluggish, flattened and swollen in the middle. Dull white, tinged on the back with faint bluish-grey, which is interrupted at each segmental division. Head pale brown, with dark brown jaws, plates both whitish. Feeding between drawn-together leaves of sallow early in June. Emerged in August.

Larvæ sent from Scotland by Mr. Watson, of Paisley, differed from these. When half-grown, they were dark or light greenish-grey, with more or less distinct, raised, shining black dots, and numerous rather long hairs. Head black, dorsal plate having the anterior half grey and the posterior black, anal plate greenish or yellowish, feet black. When full-grown, more of an olive-green, head banded with paler, dorsal plate browner.

These were found in May, feeding on birch, they produced the more mottled form of the moth in July.

Fischer describes this larva, "when young, dirty white, with black head and dorsal plate; when full-grown, yellowish-white, with visible intestinal canal, and with small black warts or shining grey dots. Head chestnut-brown, dorsal plate indistinct yellow-brown, with a white edge towards the head." Feeding on hazel, birch, aspen, and willow. Pupa yellow-brown in an earthy cocoon.

Pædisca semifuscana.—Larva, when young, active, plump, cylindrical, pale blue-green, with minute but distinct black dots. Head and plates black. When older, rather flattened, dorsal region slate-colour, whitish-green at the sides and below, and also on the last three segments. Spots whitish, with bristles. Head dark umber-brown, eyes paler, plates whitish-green.

Feeding in drawn-together willow shoots in April and May. Pupa light chestnut-brown, spun up among the dead leaves. Moths emerged at the end of June and in July.

Dr. Wocke says of this species that it feeds on *Salix cinerea* and *autumnalis*, in May.

Halonota trigeminana, Steph.—Larva cylindrical, moderately active, plump and smooth, with rather deeply divided segments. Pinkish-yellow, the dorsal region sometimes a beautiful bright pink, paler below. Head chestnut-brown with darker jaws, dorsal plate very pale brown, with a crescent-shaped blotch behind each lobe of the head, anal plate hardly perceptible, spots faintly shining with very minute hairs. When full-grown still plump, but wrinkled and tapering towards the extremities. Bright light vermilion throughout the dorsal region, faint flesh-colour below. Head very light brown, dorsal and anal plates pale bone-colour, with a vermilion tinge, feet bone-colour. When in motion, the incisures of the segments very pale.

In root-stocks of *Senecio jacobæa*, when young feeding on the outer skin, and making covered ways, meandering about the root-stock, constructed of silk and frass, and having a little chamber at the end

of the burrow in which it lies when not feeding, afterwards penetrating to the middle of the root-stock, feeding on the pith, and making a chamber of considerable size. When full-fed—in December or January—making its way out of the root-stock to spin up among rubbish on the ground.

These larvæ were found in great abundance on Mablethorpe sandhills, Lincolnshire, by Mr. W. H. B. Fletcher, in October, 1880, but believing that they would hibernate in the stems, I put them out of doors for the winter and lost them all. Mr. Fletcher very kindly sent another consignment in the autumn of 1882, which were kept indoors, but although they wandered all about the room, and spun up in all manner of substances, only one specimen emerged. Doubtless, they required exposure out of doors, but it is hardly possible to enclose out of doors, so that they cannot escape, larvæ which feed in large awkward stems like those of the ragwort.

Pembroke: *December*, 1883.

LITTLE-KNOWN BRITISH ACULEATE HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

At the commencement of another collecting season I wish to call the attention of Hymenopterists to the following *Aculeata*, whose titles to places in our list either rest on only one or two recorded captures, or whose claims to specific distinction are more or less doubtful. Some of these I feel sure would turn up again if collectors would search for them in the localities where they have occurred already, and the only hope of solving the questions respecting the doubtful species is in obtaining further specimens so as more fully to test their specific value. I therefore commend the following list to the consideration of collectors, hoping that some at least of the questions may be cleared up during the season.

1. *TAPINOMA NITENS*, Mayr, = *POLITA*, Smith.

One specimen taken many years ago by Mr. J. C. Dale at Bournemouth.

This should be carefully looked for in the Bournemouth and New Forest districts. A shining testaceous ant belonging to the section with only one node at the base of the abdomen; it could not be mistaken for any other species.

2. *POMPILUS PECTINIPES*, ♂.

Of this red-bodied species, whose ♀ is certainly not rare in sandy localities and is easily distinguishable by the posterior emargination of the prothorax being curved instead of sharply angular, the ♂ is at present unknown in this country. On the Continent, Wesmael and Thomson have assigned to it a ♂ with a rounded emargination, but no such ♂ has occurred here. F. Smith's supposed ♂ is that of *chalybeatus*. So far as my experience goes I have only found *pectinipes* in localities where *Evagethes bicolor* also occurs, and I suspect that the ♀ of the latter is found sometimes with 3 sub-marginal cells and sometimes with 2, whereas the ♂ always or nearly always has 2 only, but the only hope of solving this is for collectors to take all the ♂ *Pompili* they can find where the ♀ *pectinipes* occurs, on chance of finding its missing partner.

3. *CRABRO CLYPEATUS*, Linn.

This very distinct species appears only to have been taken by F. Smith in 1848 and 1853 at Weybridge, the triangular head of the ♂ (the apex of the triangle forms the base of the head) and the large deep puncturation of the abdomen in both sexes, distinguish it immediately; the abdomen is banded with yellow.

4. *VESPA ARBOREA*, Smith.

This to me is a most mysterious insect. Only females so far have been recognised, and they certainly differ from those of the allied species in having the basal segment of the abdomen unusually long. But why in a social insect like a wasp should the female occur singly, and no workers or males be found? One would have thought that where one sex occurred the others would occur also. It belongs to the group with the scape of the antennæ yellow in front, but has the eyes touching the mandibles or nearly so, whereby it may be at once known from *sylvestris* or *norvegica*.

5. *SPHECODES*.

The species of this genus are very difficult to distinguish, and probably several new species would reward careful collectors. The one point to be observed is that the genital armature of the ♂ be pulled out so as to be visible, and also the 6th segment in the ♀, as the specific characters are chiefly derived from these parts—the ♀ appears in June and July, the ♂ in July and August.

6. *HALICTUS LEVIS*, Kirby.

A well-marked species, easily known by its impunctate abdomen and the remote puncturation of its thorax, in which latter character it resembles *villosulus*. No specimens have been recorded since Kirby's original captures at Nacton, Suffolk.

7. *ANDRENA ANGUSTIOR*, Kirby.

Occurs on dandelion flowers, and is closely allied to *Gwynana*, Kirby, but may be known by its clear testaceous tibiae. I much wish to obtain undoubted males of this. I think it very probably = *ruficrus* of Continental Entomologists.

8. *A. POLITA*, Sm.

Taken at the chalkpits, Northfleet; easily recognised, according to Smith, by its shining finely punctured abdomen and golden apical fringe.

9. *NOMADA GUTTULATA*, Schenck.

A medium-sized species, very like *ochrostoma*, but rather smaller and distinguishable at once by the 3 short blunt black spines at the apex of the posterior tibiae. I have only seen one ♀ of this, without note of locality.

10. *MEGACHILE ERICETORUM*, Lep., = *PYRINA*, Sm., *nec* Lep.

Has occurred at Weybridge, Southampton and Bristol (*fide* Smith), but no recent captures recorded. May be easily known by the testaceous tarsi in both sexes, and the small tubercular spine on the 7th abdominal segment of the ♂, also by the well-defined apical bands to the abdominal segments in the ♀.

11. *HERIADES TRUNCORUM*, Linn.

This little insect has not occurred for a great many years; it is one of our smallest bees, scarcely larger than a *Prosopis*, but in shape more like an *Osmia*; the carina at the base of the 1st abdominal segment is a distinct characteristic of the genus. It is recorded from Dulwich and Brentford.

12. *BOMBUS NIVALIS*.

Recorded from Shetland, but the specimens in the British Museum are much smaller than continental *nivalis*. More specimens, especially males, for the examination of the genital armature are much wanted.

St. Ann's, Mason's Hill, Bromley, Kent :

April 4th, 1884.

DESCRIPTION OF A VARIETY OF *PHILOPOTAMUS MONTANUS*,
DONOVAN, FROM SCOTLAND.

BY KENNETH J. MORTON.

In July last, at a small stream at the south of Lanarkshire, I took the curious form of *Philopotamus* which, at Mr. McLachlan's suggestion, is here described. It is a beautiful and distinct-looking insect; but, notwithstanding a peculiar coloration and an apparently constant neural character, I am inclined to look upon it as being only a remarkable local variety or race of *P. montanus*, Donovan.

P. MONTANUS, Donovan, *var. CHRYSOPTERUS*.

Anterior-wings with the 4th apical fork *not reaching the anastomosis*; the membrane of these wings is nearly hyaline (neuration darker and rather distinct) clothed with bright golden-yellow pubescence, which is transversely and somewhat faintly reticulated with pale greyish-fuscos; there are also a few larger fuscous spots, one at the arculus being especially conspicuous: fringes golden, excepting at the termination of the nervures, where there are fine fuscous points. Posterior-wings with membrane rather more obscure, clothed more or less with golden pubescence in their apical third; at the apex are reticulated markings more distinct than in the typical form (in the latter, too, the golden pubescence does not encroach on the disc); fringes as in anterior-wings. Other characters and anal structure apparently agreeing with the typical form.

Three ♂ at a little stream running down the side of Tinto, a hill in South Lanarkshire.

In form of the wings, this insect is most like *P. montanus*, but in general appearance it more resembles *P. insularis*, McL., from Guernsey. However, in the latter species, for a type of which I am indebted to Mr. McLachlan, the anterior-wings appear to be of a longer oval shape, the fork No. 4 is sessile, and the pubescence *dull pale yellow*; the posterior-wings want the golden pubescence on the apical portion, on which there are only a series of marginal festoons of this colour.

Carluke, N. B.: 27th March, 1884.

Dragon-flies near Worcester.—The species of these insects taken by me in this locality are so few, and so common-place, that I have hitherto refrained from publishing a list of them; but Mr. McLachlan's welcome annotated list of the British species has caused me to think of one or two matters anent the subject that I wish to treat of, and I incorporate my local list (of 13 species) therewith.

Sympetrum vulgatum.—I am pleased to see that the name *striolatum* is now sunk, as the highly coloured specimens have long seemed to me only very mature exponents of *vulgatum*.

Platetrum depressum.—This of late years has become uncommon, and I rarely see more than one or two in a summer.

Libellula quadrimaculata.—Only two have occurred to me.

Gomphus vulgatissimus.—This also is less common than formerly.

Cordulegaster annulatus.—Only one specimen has occurred to me.

Æschna cyanea and *Æsch. grandis*.

Calopteryx Virgo.—*C. Vesta*, Charp., is accounted a form or race of this species. *C. Virgo* I have never found away from a stream, where, as is well known, it frequents the bushes and trees that fringe the water. *C. Vesta*, on the other hand, has never occurred to me on any stream, but only in woods, where it disports on and about the tops of sapling trees in the full sunlight. *C. Vesta* occurs in Trench wood, situated on a limestone ridge, near which is no stream. The Birmingham and Worcester Canal runs through the low ground below, but it is nowhere bordered by bushes or trees, and I have walked its towing-path for miles scores of times in the proper season without seeing a *Calopteryx*. *C. Virgo* frequents the river Teme, in parts where it is most shaded by trees, while within sight, and almost within throwing distance, *C. Vesta* frequents a wood on a rising ground, in which there is no stream and no body of water larger than a small pond which dries up in summer.

Calopteryx splendens.

Platynemis pennipes.

Ischnura elegans.—Local.

Agrion puella.

Pyrrhosoma minium.

A specimen of *Leucorrhinia dubia* was captured with *Sympetrum scoticum* at Whitherslack, some three or four years since, by Mr. J. H. Threlfall, of Preston, and kindly sent to me.—J. E. FLETCHER, Worcester: April, 1884.

[There can, I think, be no doubt that *Calopteryx Vesta* is founded on individuals of *C. Virgo* that have not acquired their full colour, and that the difference in *habits* of the two forms is due to the fact that *C. Virgo* (like most *Agrionidæ*) shuns the water in which it was bred until it is mature.—R. McL.]

Geographical distribution of Chrysopa venosa, Rambur.—Hitherto, so far as I am aware, this insect has only been recorded from Spain. As a curious point in distribution it is worthy to note, that I have just received three examples (2 ♂, 1 ♀) from my valued correspondent, Herr Max von zur Mühlen, of Dorpat, labelled "Persien" (by which North Persia is intended), and I previously had an example from another source labelled "Sharud, Persia." These agree with a Spanish example received from the late Ed. Pictet.

The pretty markings on the dorsum of the abdomen, tolerably well indicated by Rambur in his figure in the "Faune de l'Andalousie," ii, pl. ix, fig. 7, are an attribute of the ♀ only. In the ♂ the dorsum is somewhat fuscous, with a pale band at the posterior extremity of most of the segments. Also from North Persia I have

an example of *Ch. Zelleri*, Schneider, but this has a wide range in Southern Europe, and is probably scarcely more than a variety of *prasinæ*, Burm.—R. McLACHLAN, Lewisham, London: April 12th, 1884.

Alleged breeding of Trypeta alternata, Fall., from Impatiens (ante p. 163).—I have just received a letter from Mr. Hodgkinson on the above subject, from which it appears that he threw the mined leaves of *Impatiens noli-me-tangere* "and hips of rose together" in his greenhouse, and when the imago of *Trypeta* appeared, inferred that they were from the larvæ he saw in the balsam-leaves. It seems clear, therefore, that the *Trypeta* were derived from their known food-plant, the hips. Mr. H. purposes looking up the *Impatiens*-mining larvæ this year, so we may hope to learn what it will yield.—J. E. FLETCHER, Worcester: April, 1884.

The influence of extreme cold on the Phylloxera of the vine.—In the Transactions of the Hungarian Académie des Sciences, 1883, Dr. Géza de Horváth has an article giving the result of his experiments on this subject, from which we make the following extract:—"It is known that insects in general are endowed with great vitality, and that they can often endure cold by which many other animals and plants are killed. In the spring, caterpillars are often found quite alive, which have hibernated under shrubs destroyed by the winter." After adverting to the experience of M. J. Fallou with eggs of *Bombyx neustria*, which sustained the temperature of -26° C.; of M. J. Lichtenstein with divers *Aphides*, at -11° and -12° C.; and of M. Girard with the *Phylloxera* of the vine, at -6° to -10° for several days—all without detriment to the insects—he continues with the narration of his own experiments: "On the 4th of February, I grubbed up in the experimental ground of the Hungarian *Phylloxera*-station at Farkasd (dept. of Pest) some old vine-stocks, which were severely attacked. These stocks, of which the roots were covered with *Phylloxera*, remained on the surface of the cleared ground; on the 22nd February, that is 18 days afterwards, I examined the roots, with the expectation that the *Phylloxera* would all be dead. But what was my surprise when I discovered on one stock, on a little branched root, about 2 mm. in diameter, a *Phylloxera* living in a small group of five dead ones. This example was living in its winter sleep, but it was distinguishable at once from its dead companions; when taken into a heated room it soon recovered, and four hours after it began to move and walk. This hibernating insect then had been for 18 days in the open air, exposed on a place open on all sides to cold, wind, snow, fog, and sunshine, and yet it remained alive."

"The temperature fell every night below zero, once it was -8° , twice -9° , once -10° , and once -12° C. If in the winter the soil is frozen, it is certain that many *Phylloxera* will be killed, but there remain a large number, and that not only in deep situations where the frost does not penetrate. I have often observed living *Phylloxera* even in upper strata of frozen soil, and more than once I have found in hard, frozen ground, at a depth of 10 centimètres, some of the insects in hibernal lethargy, yet alive. To the insects which have taken refuge in the deeper strata of the soil not even the most rigorous winter can do any harm."

"It results then, that in the contest with *Phylloxera* the insecticidal action of cold and the frosts of winter cannot be absolutely counted upon to aid."

Ammæcius brevis, Er., at Bewdley.—Towards the end of last month (March) I captured three specimens of *Ammæcius brevis* in a sandy bank of the Severn near Bewdley. Besides my previous note of its occurrence at Matlock (Ent. Mo. Mag., xix, p. 117) I have seen no record of this beetle being found in an inland district.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: April 15th, 1884.

Homalota (Leptusa) testacea, Ch. Bris., at Weymouth.—I found this exceedingly rare beetle in some numbers on the coast near Weymouth in the early part of last June. It occurred under stones embedded in the sands, below high water mark, in company with *Diglossa mersa* and the two species of *Phytosus*, which latter it somewhat resembles in appearance as well as in habit. *Homalota testacea* must be fairly plentiful in the neighbourhood of Weymouth, as I captured about thirty specimens, and could, doubtless, have taken more had not the wet weather interfered with my collecting.—ID.

Notes from Cambridge.—The extremely mild winter and spring has had its natural influence on insect life. The spring-feeding larvæ, especially, show an increased abundance, and this, I think, promises well for the prospects of the season of 1884, especially as regards the late summer and autumn *Lepidoptera*. The larvæ of *Hepialus humuli*, for instance, have been excessively abundant at roots of low plants; I never remember them more so. I have found several larvæ of *Noctuidæ* in the early morning, such as *Leucania lithargyria*, *L. pudorina*, *Grammesia trilinea*, *Cerigo cytherea*, as well as such species as *Noctua c-nigrum* and *N. xanthographa*, of common occurrence everywhere, together with some others more worthy of mention, of which I will send notes later on.—ALBERT H. WATERS, Cambridge: April, 1884.

Thirsty Butterflies.—In "Nature," for May 17th, 1883 (p. 55), appeared a letter from Mr. E. Dukinfield Jones, in which the author stated that he had observed a kind of moth in Brazil engaged in sucking up water in large quantity through its proboscis. I may say that this strange habit is not confined to the moth in question, as I have observed the same thing in two species of butterfly (*Papilio Orizaba*, B., and *Appias saba*, F.), and imagine that the phenomenon is by no means rare. These two butterflies are very common by the sides of streams and damp places on the Ankey plain in Madagascar.

One morning, while sitting by the side of one of these streams, I noticed the *Papilio*, which is an insect measuring about four inches from tip to tip of its wings, resting on a wet bank; and wishing to procure it as a specimen, I approached it as gently as possible, the creature being apparently so absorbed in what it was about as to be totally unconscious of my proximity to it. Noticing strange and unaccountable movements—sundry jerks and probings with its proboscis—I quietly sat down near it in order to watch it more closely. I observed that every second or two a drop of pure liquid was squirted (not exuded merely) from the tip of its abdomen. I picked up a leaf that was lying near, and inserted the edge of it between the insect's body and the ground, so as to catch the liquid. Unfortunately, I had no watch with me at the time, nor means of measuring liquids; but I reckoned that about thirty drops

were emitted per minute. I held the leaf for about five minutes—as nearly so as I could reckon—and at the end of that time there was caught in it about a salt-spoonful of what seemed to be pure water, without either taste or colour. After watching the butterfly for a time, I seized it by the wings between my thumb and fingers with the greatest ease, so utterly lost did it appear to me to what was going on near it.

In another spot, I saw as many as sixteen of these large butterflies within the space of a square foot, all engaged in the same strange action. Some of them emitted the liquid more frequently than others; and one of them squirted the liquid so as to drop fully a quarter or a third of an inch beyond the point on the ground, perpendicular with the end of its body. It was at this spot that I saw the second species of butterflies alluded to also engaged in the same curious proceeding.—R. BARON, Antananarivo, Madagascar: *January 3rd, 1884 (extracted from "Nature," March 27th, 1884).*

[That most butterflies drink must have been observed by all entomologists even in England, and more especially in the Alps of Europe, where it is not at all unusual to see groups of fifty or sixty individuals engaged at a damp spot on a hot day. The interesting points in the above extract are, firstly, the great quantity of water taken in by an individual in a short space of time; and, secondly, the fact that it was apparently discharged as fast as taken in—a kind of bath taken *internally*.—EDS.]

Food-plant of Sciaphila pascuana, &c.—As supplementary to Mr. Barrett's notes on the genus *Sciaphila* in this month's Ent. Mo. Mag., pp. 241—4, I may add, that two seasons ago I bred *S. pascuana* freely from larvæ collected spun up in the flowers of *Ranunculus bulbosus*, in a rough uncultivated field near here. *S. ictericana* also emerged from the flowers in about equal numbers with *S. pascuana*, and with them one specimen of *S. octomaculana*.—GEO. T. PORRITT, Huddersfield: *April 3rd, 1884.*

Review.

ROVARTANI LAPOK: Budapest, 1884.

This is a new Entomological Magazine in the Hungarian language published monthly by the Editor Dr. G. Horváth, who is assisted by Messrs. J. Frivaldsky, Al. Mocsáry, J. Paszlavszky and Dr. Edm. Tömösvary. All communications should be sent to the Editor at Budapest (au palais du ministère de l'agriculture).

With No. 3 is given, in French, a Supplement (to be continued) containing a summary of all the articles published, in order to put entomologists in general in possession of a concise idea of the contents of the publication. From the Introduction we learn that during the last 15 years the natural sciences have made considerable progress in Hungary, and that a general progressive activity is discernible in entomological studies; and this journal is established to encourage and assist in developing and making popular knowledge of insects, especially of such as are beneficial or injurious to agriculture, in other words, to make entomology scientific, popular and practical in that country. The contents are varied; the chief articles

in the three numbers published are ; An elementary lesson on the morphology of Insects, illustrated ; On the evolution of *Æcanthus pellucens*, with a plate ; On the organization of Agricultural Entomology in Hungary ; Metamorphoses of *Lethrus apterus*, with a plate ; On the respiratory organs of the nymph-state of *Simulia*, illustrated ; Hermaphrodite Insects in the Hungarian National Museum, illustrated ; Description of a new species of *Tenthredinida*,—*Dolerus 4-notatus* : there are also short notes, with figures. Altogether, such a well-conducted journal as this should be of essential service to the objects in view, and we wish it every success.

This publication has no kind of connection with the "Rovarászati Lapok," noticed *ante* p. 20, which, indeed, is defunct for want of efficient nourishment and support.

Obituary.

Sir Sidney Smith Saunders, C.M.G., died suddenly at his residence, Gatestone, Upper Norwood, on the 15th April ; he had suffered from one of his frequent attacks of bronchitis for a few days previously. He died truly "in harness," for he had just been engaged in correcting the proof of a paper he read at the meeting of the Entomological Society on April 2nd.

Sir S. S. Saunders was the son of Mr. William Saunders, of Wandsworth, and was born in June, 1809 ; he was a cousin of the late Mr. W. Wilson Saunders. In 1826 he obtained an appointment in the Consular Department of the Foreign Office. In 1835 he was made British Consul in Albania ; was transferred to Alexandria in 1859 ; in 1861 and 1862—1863 was Acting Agent and Consul-General ; and Consul-General in the Ionian Islands, from 1864—1870 ; all of them onerous positions viewed in the light of the political history of the period. In 1860 he was made a Commander of the Order of St. Michael and St. George, and was knighted in 1873.

As an entomologist, the list of memoirs by him at the foot of this notice speaks for itself. His studies were eminently biological, and in every published result of them he showed the *thoroughness* of his working ; not a point of habits, anatomy, or bibliography, being left without personal investigation. His studies on *Strepsiptera* and fig-insects naturally led him to microscopic examination, and those who have seen his beautifully mounted microscopic dissections of insects microscopic in their entirety, can do naught but marvel at the patience and skill displayed by an old man, for many of his best preparations were made when he was already past three score years and ten. Those who listened to his papers read before the Entomological Society could not but feel admiration at the enthusiasm, and utter obliviousness of surroundings, displayed by him. In his particular branch of investigation it will be difficult to find a successor. He was one of the original members of the Entomological Society of London (now reduced to five), was President in 1874-75, and was one of the Vice-Presidents at the time of his death.

Sir Sidney Saunders leaves a widow, and four sons and four daughters, to mourn his loss. Invariably courteous in bearing as became a diplomatic official of high standing, it can truly be said he had only friends. He was a good classical scholar, and was a master of several European languages, including some (such as modern Greek) known to only few Englishmen.

His published papers, numerous though they be, probably afford a poor comparison with the notes he has left behind him, and from his method of work, it is not probable that these latter can be utilized.

The following is a probably complete list of his published memoirs, all of which appeared in the Transactions of the Entomological Society of London.

Descriptions of some new Coleopterous Insects lately received from Monte Video: Tr. Ent. Soc., ser. i, vol. i, pp. 149—157 (1836). On a new genus of *Diptera* allied to *Stratiomys*: ser. i, vol. iv, p. 62 (1845). Descriptions of two new Strepsipterous insects from Albania, parasitical on Bees of the genus *Hylæus*: ser. 2, vol. i, pp. 43—59 (1851). Descriptions of some new Aculeate *Hymenoptera* from Epirus: ser. 2, vol. i, pp. 69—75 (1851). Notes on some new species of Strepsipterous Insects from Albania, with further observations on the Habits, Transformations, and Sexual Economy of these Parasites: ser. 2, vol. ii, pp. 125—144 (1853). Observations on the habits of the Dipterous genus *Conops*: ser. 2, vol. iv, pp. 285—291 (1858). Stylopidarum, ordinem Strepsipterorum Kirbii constituentium, mihi tamen potius Coleopterorum Familiæ Rhipiphoridis Melöidisque propinquæ, Monographia: 1872, pp. 1—48. On the habits and economy of certain Hymenopterous Insects which nidificate in briars; and their Parasites: 1873, pp. 407—414. On the adult larvæ of the *Stylopidae* and their puparia: 1877, pp. 195—197. On the habits and affinities of *Apocrypta* and *Sycophaga*, with description of a new species of *Apocrypta* from the figs of *Ficus sycomori* of Egypt: 1878, pp. 313—320. On the habits and affinities of the Hymenopterous genus *Scleroderma*, with descriptions of new species: 1881: pp. 109—116. Notes on *Euchalcis vetusta*, Dufour (Fam. *Chalcididae*) and on the terminal segments of the females in *Halticella* and its allies: 1882, pp. 291—305. Descriptions of three new genera and species of fig-insects allied to *Blastophaga*, from Calcutta, Australia, and Madagascar; &c.: 1883, pp. 1—27. On the *Cynips carica* of Hasselquist, and other fig-insects allied thereto: 1883, pp. 383—392. On "*Pediculus melittæ*:" 1884.

In addition to these, his notes and materials formed the subject-matter of several papers by the late Frederick Smith, and his surviving colleague Prof. Westwood, upon whom the death of his old friend has fallen as a severe blow.

No where will he be more missed than at the Meetings of the Entomological Society; at which, since his retirement from official duties, he was a constant attendant.

ENTOMOLOGICAL SOCIETY OF LONDON: 5th March, 1884.—Special General Meeting. J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

It was proposed by Prof. Westwood, and seconded by Mr. Stainton, that it is desirable to obtain a charter for the Society. After some slight discussion this was carried *nem. con.*

Ordinary Meeting.—Prof. WESTWOOD, Honorary Life President, in the Chair.

H. H. C. J. Druce, Esq., of St. John's Wood, and the Rev. A. Fuller, of Chichester, were elected Members.

Mr. E. A. Fitch exhibited a large Coleopterous larva, apparently Geodephagous, which he was assured had been coughed up by a young man at Maldon who was suffering from bronchitis. Some Members present appeared to be slightly incredulous, and suggested the possibility of an error in observation.

Mr. E. Saunders read the concluding portion of his Synopsis of British *Aculeate Hymenoptera*, and also a paper on the anal segments of insects of the same group.

A discussion on nomenclature ensued, arising from some remarks by the President respecting a recently-described butterfly which the describer avowedly named after himself, and respecting the generic terms *Darwinhydrus*, *Tyndalhydrus*, *Spencerhydrus*, &c., employed by Dr. Sharp a few years ago.

2nd April, 1884.—The PRESIDENT in the Chair.

The following were elected Members, viz.:—Stanley Edwards, Esq., of Blackheath, E. P. Collett, Esq., of Kentish Town, J. A. Finzi, Esq. (formerly a Subscriber), of Gower Street, F. Lovell Keays, Esq., of Cobham, and Edward Shuttleworth, Esq., of Preston.

The President read a letter received from the describer of the butterfly noticed in the report of the previous meeting.

Mr. Billups exhibited *Diospilus oleraceus*, Hal., and *Sigalphus obscurellus*, Nees., two species of *Braconidæ* parasitic on *Ceuthorhynchus sulcicollis*; he remarked that whereas one of these underwent its transformation within the swellings caused by the beetle-larva, the other came out and formed cocoons in the earth. He also exhibited *Dimeris mira* and *Ceroptres ærator*, new to Britain, the latter also indicating a new British genus. Also *Philonthus thermarum* from cucumber frames at West Ham. Mr. Pim said he had taken the latter at Dulwich.

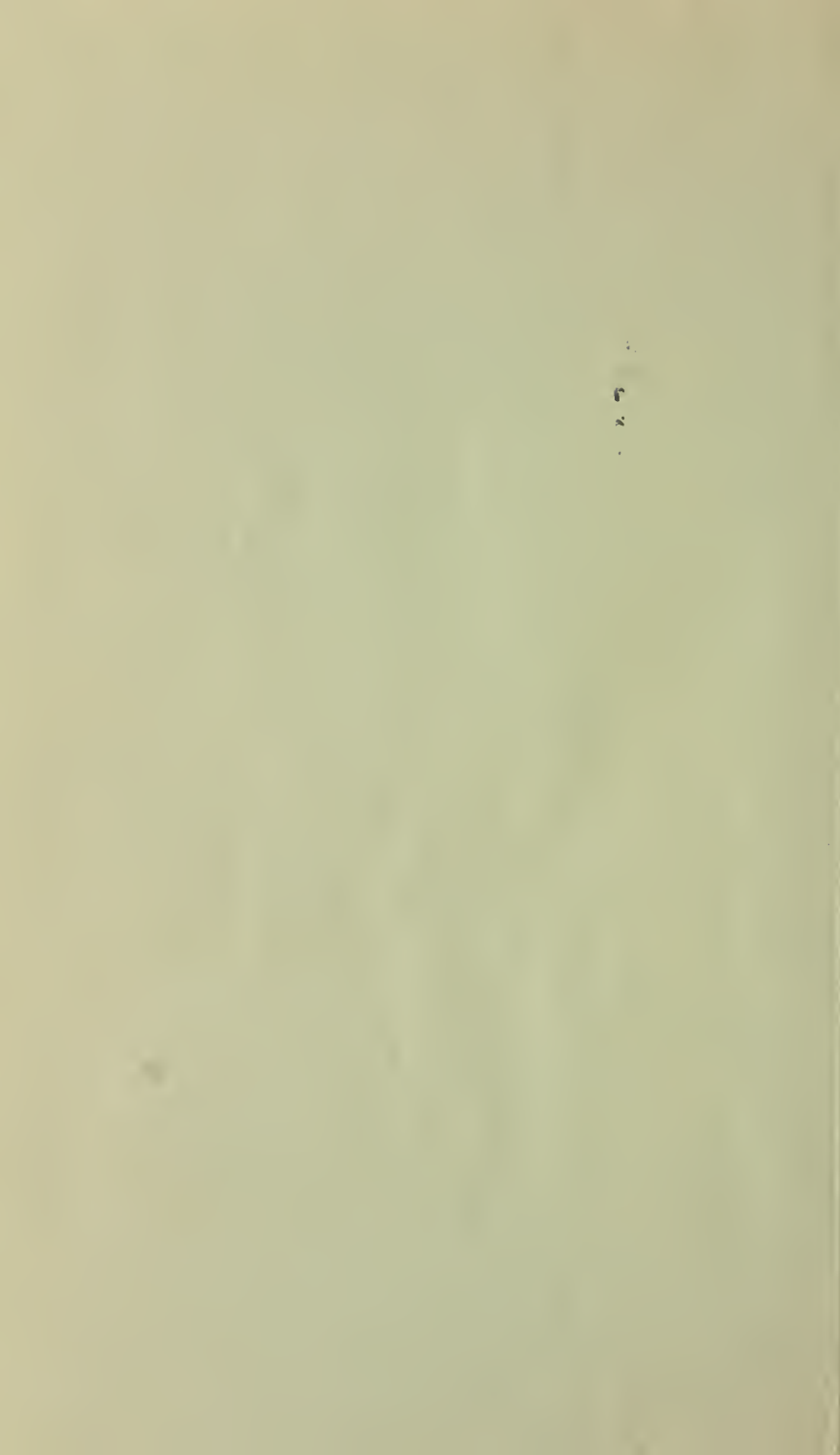
The Rev. A. Fuller exhibited a small number of figures of the larvæ of British *Lepidoptera*, made by the late Mr. Buckler.

Sir S. S. Saunders read a long and interesting historical and biological sketch, respecting the vexed question:—What is *Pediculus melittæ*, Kirby? He considered that, in all probability, it is founded on young larvæ of *Meloë proscarabæus* that have been arrested in their development, the black colour being only the result of age.

Mr. Elwes read a paper, illustrated by specimens and diagrams, on the "pouch" of the females of the genus *Parnassius*. After alluding to the supposition that these pouches are not developed until after the insect has paired, he proceeded to demonstrate that they were of great value as a means of grouping together and separating the numerous species, some of which he considered were, on this character, little more than local forms. A discussion ensued in which Messrs. Fitch, Weir, Pascoe, Kirby, and others, took part.

Mr. Meyrick read a further paper on the classification of the Australian *Pyralidina* treating on the families *Masotimidæ*, *Botydidæ*, and *Scopariidæ*.

Lord Walsingham communicated a paper on North American *Tortricidæ*.



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