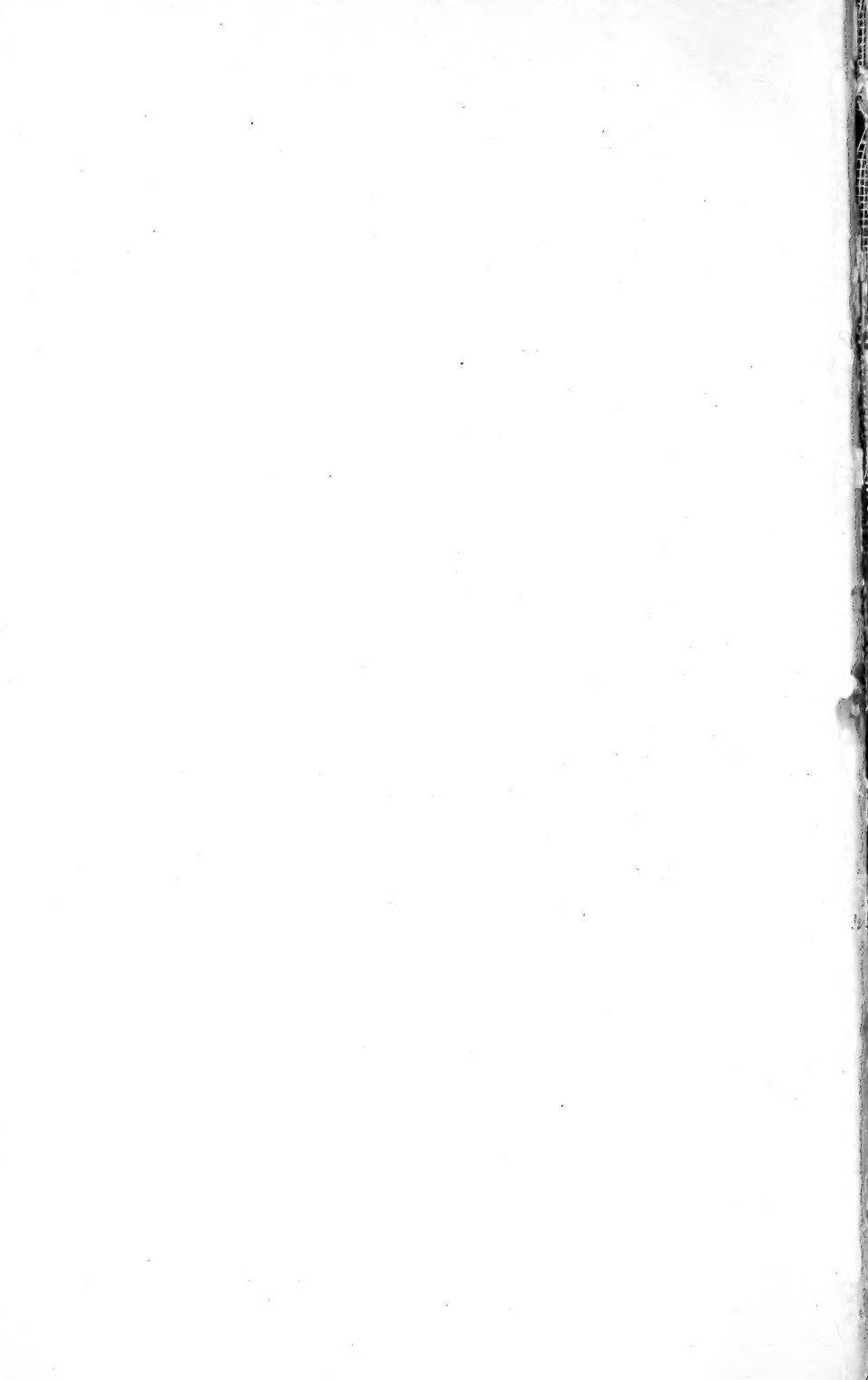


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THE
YOUNG NATURALIST :

A MAGAZINE

OF

NATURAL HISTORY,

CONDUCTED BY

JOHN E. ROBSON, Hartlepool,

WITH THE ASSISTANCE IN VARIOUS DEPARTMENTS OF

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THE MOLE (*Talpa Europæa.*)

By HENRY HILLMAN.

PERHAPS the most strange in habit of our indigenous quadrupeds is the Common Mole. This little animal, tunnelling and boring beneath the surface of the soil, is not often seen by the casual observer, so that a short account of its life history may be acceptable.

The species may be described as follows:—The body rather long, nearly cylindrical, rounded behind; the neck extremely short, so that the head seems to lie between the shoulders; the snout elongated and depressed, with a ridge along its upper and a groove along its lower surface, its extremity narrow but abrupt; the nostril terminal; the eye extremely small, the eyelids opening to a very small extent; the external ears obsolete. The limbs are very short; the front feet are extremely broad, with the palm directed outwards or backwards; five toes, with an internal rudimentary toe or appendage, consisting of a bone and apparently serving to broaden the part for digging, the first and fifth toes nearly equal, the third longest, the fourth next, the second slightly shorter than the fourth; the upper surface almost destitute of hairs, the lower bare and wrinkled; the claws straight, depressed, thin, and rounded at the end, a little concave beneath, and having at the base a fixed sheath; on the hind feet, which are rather small and of the ordinary form, are five toes, with an internal rudimentary toe or appendage; the claws a little curved, slightly bent inwards, compressed, tapering to a point, and grooved beneath; the sole bare and rugose, the upper part slightly hairy.

The fur is uniform, consisting of under fur, and having no grain, there being no strong hairs unless on the tail, and a few on the snout. The general colour is blackish-grey, viewed against the pile brownish-black, along the pile bluish-grey and glossy; the lower parts paler, especially the abdomen, the lower jaw reddish brown; the lower parts of the neck, and fore part of

the shoulders slightly tinted with the same colour, the eyes dull black, the snout flesh coloured, as are also the bare parts of the feet, as well as the claws.

The snout is furnished with a small bone at its extremity. The muscles are extremely developed, especially those of the arm, fore-arm, and hand, and admirably suited to the animal in its peculiar habits. The vision of the Mole is extremely dull, but well suited to an animal destined to spend the greatest portion of its life underground. The sense of hearing is extremely acute, although it has no external ear to collect the vibrations of the air. Its instantaneous perception of the slightest movements in the air or ground, may, however, be accounted for, by according to it a highly sensitive organization such as exists in bats.

The food of the mole consists chiefly of earth-worms (*Lumbricus terrestris*), in search of which it burrows its way in the soil, extending its sphere of operations in proportion as its prey diminish in numbers; but the excessive and unremitting labour required in this pursuit, were it carried on at random, is rendered unnecessary by an instinct which impels it to excavate a series of mines or galleries, along which it can walk without inconvenience, and from different parts of which it proceeds, forcing its way into the hitherto unperforated soil. In forming its underground passages, it works with its fore-feet, which as has been seen, are admirably adapted for scraping away the earth and throwing it backwards, at the same time propelling itself forward with its hind feet, which are disposed in the usual way. When it has executed an extended series of runs it can travel along them to any point without difficulty, and finds security in them from the pursuit of many animals, but man employs them as a sure means of entrapping it.

Each individual seems to appropriate to itself a district or space of ground, in which it forms a kind of fortress, under a mound raised in some secure places, as beneath a bank, or near the roots of a tree. In this retreat, of which the earth is by the mole rendered very compact, is formed a circular gallery communicating with a smaller gallery placed above, by several passages. On the level of the lower or longer gallery is a roundish cavity or chamber, communicating with the upper by two, three, and often four passages. From the outer gallery branch off a number of passages, which run out to various lengths, and forming an irregular curve terminate in what may be called the high road, from which branches a long passage proceeding from the lower or larger gallery, at the same time communicating directly with the central cavity. It extends to the furthest extent of its domain, is of somewhat greater diameter than the body of the animal, has its walls comparatively compact, and communicates with the numerous passages by which the animal's

domain is intersected. By this main passage or tunnel the mole visits the various parts of its hunting-ground, burrowing on each side and throwing out the earth here and there, so as to form "mole hills."

The excavations vary in their depth from the surface, according to the nature of the soil and other circumstances. In deep rich soil they are often nearly a foot in depth, while in gravelly, clayey, or heavy soil they are scarcely an inch. The mole often burrows quite close to the surface of rich loose soil which has been ploughed, and sometimes runs along it, forming merely a groove or trench, the principal object of its search being the earth-worm, but it also feeds on larvæ, especially "wire-worms." Slugs, snails, lizards, frogs, and birds also form part of the diet of this rapacious animal, and on one occasion I witnessed one in the act of devouring a small slow-worm. Its voracity is excessive, so much so that hunger causes it to become exceedingly furious, and it quickly dies if deprived of food. It drinks excessively for so small a quadruped, and invariably forms a tunnel from its domain in direct connection with the vicinity of a dyke, brook, or pond.

During winter, when the cold forces the worms deeper into the soil, it follows them into their retreats, driving its tunnels to a corresponding depth. During very severe weather it retires to its fortress, in which it has formed a bed of dry grass and roots, upon which it sleeps until the return of more congenial weather. In spring it quits this habitation, and rests during the warm weather in the mole-hill. On the surface of the ground, to which it sometimes makes its way, it can run with considerable speed, but, if not in the immediate vicinity of its hole, it is easily overtaken. If by the rising of a river its domain becomes inundated, it rises to the surface and swims with great vigour, and instances are on record of its swimming through rivers to higher and drier ground.

The males are far more numerous than the females, and the former sometimes fight desperately, especially in the early part of the year when in pursuit of the females. The number of young produced at a birth is generally four, and the period of parturition extends over the whole of the summer; most litters are born in April, but I have found on two occasions litters as late as September, so that in all probability they produce more than one brood in the year.

The young are produced quite naked, and remain so about seven days. About twenty days after birth they provide for themselves and retire to pastures new. When a young mole by chance, accidentally comes to the surface it runs about as if lost, and if not in the immediate vicinity of its hole when surprised, endeavours to bury its head in anything that will afford it shelter. One that I witnessed in Richmond Park, during the first week in

May, ran about in a complete frenzy with its head close to the earth, and its tail erect, uttering a sharp searching sound, and when I prevented it from entering its hole it bit my stick with great violence, and when I endeavoured to pick it up it turned upon its back and scratched furiously with its front feet.

Moles vary in colour, as may be inferred from the variety we have in our collections and museums. One that I possess is of a cream colour, another orange and rufous-red under the neck, and one other jet black.

Much has been said about the utility of the mole to mankind. It is undoubtedly the farmer's best friend. It destroys the grubs that affect roots of all kinds; and boring and tunnelling in heavy and stiff soil increases the drainage, and materially benefits the land. When it makes its appearance beneath lawns and flower gardens it causes destruction. But which is the greater evil of the two? To have the roots of flowers and our lawns destroyed by larvæ and worms, or to allow the mole to rid us of our pests and then seek fresh quarters?

TAKING LEPIDOPTERA ON GRASS STEMS, &c.

By JOHN HILL.

I see from time to time in the *Young Naturalist*, records of captures in different parts of the country by entomologists, but amongst them all I never see any account of a very simple plan I try, and which I find very successful, namely, by searching the grass in the evening, say from 5 till 8, commencing in May and continuing till the end of July. During that time in different localities I have met with a great many insects, some of them varieties, as the list below will show. The best of it is there is not much trouble with them, and the greater part are newly emerged specimens, quite equal to bred specimens. Very few require the net for capturing them, the greater part will if you disturb them with your finger, crawl on to it, and you can then examine them, if they are what you want you can easily bottle them, if not you can flirt them off your finger and they are done with, no trouble of netting. Of *Fidonia piniaria*, I could, in this manner this season, have taken 300 females; I did take and set out 100. I examined nearly all I met with, as it varies very much with us, the male also varies in colour as we meet with both northern and southern forms. My object in taking so many females was to try and see if I could meet with any forms that were near the colour and markings of the males, and to try and get a series with the colouring and markings of the males and

females as near alike as they could be. I have been pretty successful. I have a series in which you can hardly tell where the males end and the females begin, the difference in structure only telling where. I examined a large number of males in the hopes of finding varieties, of course the light portions varied from clear white to yellow, but what I wanted was to see if I could meet with anything striking, but out of some hundreds I only met with three worth calling varieties. The female, as I said before, varies from specimens nearly like the males (and which are rare) in marking, to orange without any markings, and to quite a smoky colour.

I have also seen remarks about *Anarta Myrtilli* being very difficult to catch. I find that by searching the heath in the evening at the time stated above, you may find them at rest on the tops of the heath, and as a rule in splendid condition. Whether they only emerge in the latter part of the day, and crawl up the heath to dry their wings and stop there till next day, I am unable to say, but I find it a great deal easier to pick them off into the killing-bottle, than to run after them in the hot sun.

Below is a list of insects I have met with by this method:—

H. hectus.—I have met with specimens where the silvery markings are carried on to the hind wings.

H. lupulinus.—Not so common as the next.

H. vellela.—Common.

H. humuli.— „

U. sambucata.—Once.

R. cratagata.—Common.

M. margaritata.—Commonly, and frequently before the green colour has faded.

E. fasciaria.—Frequently. I met with a splendid dark variety this year.

E. dolabraria.—Twice.

S. illunaria.—Occasionally. The summer brood.

S. lunaria.—Once.

O. bidentata.—Very common, sometimes a dark variety of the male.

A. betularia.—Occasionally, sometimes the black variety.

B. repandata.— „

T. biundularia and *punctulata*.—These are common on the tree trunks, but I frequently find them on the grass just emerged. *Biundularia* occurs all shades, from the light form to nearly black.

I. lactearia.—This as a rule is bleached when you find it, but I met with one this year before that process had taken place.

E. punctaria.—Occasionally.

A. aversata.—Frequently, sometimes the dark-banded red variety.

C. pusaria.—Frequently.

M. liturata.—Some years very freely ; this year for instance.

L. multistrigaria.—This occurs earlier in the year, but I find the females freely by searching the grass with a light.

E. lariciata.—Abundant.

E. indigata.—Very freely some seasons, this year especially.

E. nanata.— „

E. minutata.— „

T. variata.—Some very dark forms occasionally.

T. firmata.—Occasionally ; sometimes a dark form.

M. ocellata.— „

M. galiata.— „

C. unidentata.— „

C. bitineata.—Frequently.

C. populata.— „

P. falcula.—Occasionally. This is one that requires the net.

E. palumbaria.—Twice.

N. camelina.—Occasionally.

N. dictæoides.—Four times.

N. dromedarius.—Occasionally.

C. duplaris.— „

A. rumicis.— „

L. impura.— „

L. pallens.— „

X. rurea.— „

A. porphyrea.— „

T. piniperda.—I picked up two specimens of this in the last week of June this year.

X. cerago and *silago*.—I find these later on very freely ; sometimes the var. *flavescens*.

H. dentina.—Frequently.

P. anæa.—Occasionally on the heath.

Of the Micros I meet with a good few, amongst others:—

H. prasinana.—Occasionally.

T. cinnamomeana.—A nice series this year.

P. picana.—Frequently.

S. ocellana.—Six specimens this year.

R. pinicolana.—Twice this year.

HINTS ON PRESERVING PLANTS.

By J. P. SOUTTER.

Noticing the query by Mr. Taylor, in the *Young Naturalist* for November, perhaps a few hints upon collecting and pressing plants, based upon a pretty lengthy and successful experience, may prove interesting to beginners who are forming a herbarium. Mr. Taylor seems to be no novice, so to him some of these remarks may seem trite and needless, but if he will try painting his dried specimens with a solution of nitric acid, one part of the acid to 20 parts spirits of wine, it is said to be a good preservative of the colours. In practice I have found that care and patience are the most essential requisites in ensuring good specimens. Doubtless, some are much more fugitive in their colouring than others, and even seem to defy all efforts to preserve them so as to retain a presentable appearance. Indeed it is characteristic of certain plants to turn black in drying, such as *Melampyrum*, &c.

If we can choose our time for gathering plants, they should be plucked when quite dry, and transferred as soon as practicable to the drying press. In the same way if there is a possibility of choice one should select as perfect a plant as can be got, with as many as possible of the characteristic phases, such as fully developed leaves, flowers, and fruit. This will often necessitate the preserving of more than one specimen to show the successive stages. In all small plants the roots should also be carefully dug up, cleared of the the adherent earth, and dried along with the specimen. When this is impracticable from the bulk or stature of the plant, a knife should be used and the bulk or blossom neatly cut off, nothing looks more slovenly than the ragged end of a broken branch in the herbarium. Before setting out on a collecting expedition it is necessary to have some sort of a receptacle to receive your plants, as they wither so quickly when carried in the hand. For this purpose a tin box is best as it excludes the air thoroughly, and if need be the plants will keep fresh for several days, till they can be attended to. In very dry hot weather it is a wise precaution to line it with a little damp moss or grass or a few thick leaves. In thick-stemmed, succulent, or fleshy plants it is advisable to slice the stem longitudinally, and scoop out a portion of the interior.

Having now prepared your plant for the drying process, the object is to keep it flat by continuous pressure, and absorb the moisture by bibulous paper. To attain this end a screw press is desirable—but by no means essential—as the same effect can be obtained by loose weights laid on the top. Indeed these have the advantage of automatically sustaining the pressure when the bulk of the pile subsides, whilst the screw requires frequent tightening

under similar conditions. To the collector of limited means it is not absolutely requisite to be provided with a large stock of the thick absorbent botanical paper, prepared for the purpose of drying plants, but a number of sheets of it, or of thick blotting paper, is highly desirable. For ordinary purposes a common 8-page newspaper, folded in two so as to give eight thicknesses, and trimmed neatly to a uniform size of 18 by 12 inches, are sufficient. Of these a large supply should be provided, as also a number of similar sized pieces of stout pasteboard, and two equally large half-inch boards. The paper must all be thoroughly dry, and double the quantity should be available that will be required at any one time. Having now the plants, paper, boards, and weights—which may be a large stone, a few bricks, or books—all ready, proceed by laying on one of the boards one or two of the folded newspapers, then a sheet of absorbent paper, and on it spread out your plant as evenly and naturally as possible; no trimming should be attempted as the object is to preserve the plants with all their characteristics as prominent in death as in life. If you want your specimens simply for ornament you may arrange them as artistically as you know how, but these, although pleasing to the eye are not botanical specimens. Sometimes with refractory plants considerable difficulty is experienced in getting them to assume a presentable appearance, only care and patience, with the experience which comes from practice will overcome these untoward conditions. Having displayed the plant to your mind cover it carefully with another sheet of absorbent paper, then two or more layers of newspaper, then another sheet of drying paper, on which a plant is placed and covered as before. By the time half-a-dozen specimens have been thus arranged the pile will have become somewhat uneven, having a tendency to bulge up in the centre. To restore the level place one of the pasteboard sheets; these are also useful as ready divisions betwixt different day's collections. When the pile is complete place the other board on the top and put on the weights. Along with each plant should be placed a slip of paper with the name, where gathered, and the date. This is of the utmost importance to avoid inextricable confusion in the future when specimens accumulate.

If the plants have been gathered when damp, or if they are very juicy and succulent, they should be looked at in 12 hours time, and the intermediate sheets of paper replaced with perfectly dry ones. In any case this should not be delayed longer than 24 hours for the first change of drying paper, and those taken out of the press should be thoroughly dried before using again. It is only by great care and attention in this particular that successful specimens can be produced. Experience teaches many little details which add greatly to the general results. Thus if the plants are at all limp and

flaccid, and you have got them nicely displayed on the first sheet of drying paper, you should not attempt to lift them on to another dry sheet when you change the paper in the press, but you may lift off the top sheet, and replace it with a dry one, being careful not to disturb the position of the plant. If the intermediate sheets are changed frequently—and always perfectly dry—they will absorb the moisture and the plant will dry nicely. Indeed certain flowers, such as the violets, cannot be successfully dried at all if ever the pressure be removed till they are quite finished. The petals curl up and shrivel if exposed, and can never be satisfactorily replaced again. In such cases the remedy is to put the plant as nicely as possible at first, and keep it between the two sheets till thoroughly dry.

One of the commonest mistakes the young collector is apt to fall into is the attempt to preserve too many specimens at one time, the result in general being that the whole are spoiled, or at least imperfectly done. One really good specimen is worth any number of defective ones. And better have a small and neat collection of well-preserved examples, than a heterogeneous aggregation of scraps and fragment, which too often appear as the first-fruits of the flower gathering fever.

There is no hard and fast line as to how long plants require in the drying process. With many small and arid plants, two or three changes of paper with continuous pressure for a fortnight, may prove all that is needful, whilst juicier plants may require constant care and frequent changes for weeks. As a rule grasses give the least trouble, and sedums and water-plants the most. The heaths and pines are very apt to shed their leaves in the drying process. The sedums are so tenacious of life that it is almost impossible to kill them so as to make mummies of them. Their inherent vitality is so great that they will grow for weeks in the press. A good and effective plan is to dip them for a few moments into boiling hot water, before putting them into the drying paper; this kills them quickly. Only experience can tell when a plant is so thoroughly dried that it will not change in appearance after removal from the press. They generally become rather brittle and friable, so that a leaf or stem will snap much more readily than when green. As this is a consummation to be avoided they should be handled tenderly and with care. They cannot be kept too long in the press, but in the height of the season, when one is always adding to their store, they accumulate so fast that one must stow them away to make room for others. They should therefore be carefully removed, a sheet of paper placed over each specimen, a moderate number enclosed in one common wrapper, and stowed away under gentle pressure, to keep them flat till leisure can be got to mount them for permanent reference.

An expeditious way of drying small plants is to place them between several

sheets of absorbent paper, and press them with a hot iron. This seems to absorb the juices so quickly as to prevent much change of colour, but except they are kept flat by pressure for some time, they are apt to curl up when exposed to the air. And the very celerity of the process prevents any re-arranging or smoothing out of creases in leaf or petal, which may be successfully done in the first change of paper by the more common way.

In mounting specimens stout white cartridge paper is desirable, but whatever the quality chosen, the sheets should all be cut to a certain uniform size which ought not to be less than 15 inches by 10 inches. The specimens should be arranged as naturally as possible upon the sheet, and then fastened down with neat strips of gummed paper—postage stamp edging does excellently well. Some prefer to use a thin solution of gum-arabic, which also has its advantages in securing the plant firmly to its place, and its drawback is the difficulty of removing the plant from the paper, if through any chance you should wish to do so for examination. It has also a tendency to cockle or curl up the more delicate parts of the plant in its application, and to leave too obvious traces of its use. Nevertheless, it is very desirable always to have some on hand when mounting is going on.

As a rule only one specimen should be placed on a sheet. If the plants are small, and you have abundance of specimens, two or three may be displayed side by side. But in no case should the sheet be crowded, and certainly distinct species ought never to appear on the same sheet, except it might be for educational purposes to show their differences. It may often be desirable if there is sufficient space, to place on the same sheet with the typical specimen, a root leaf, a mature fruit, or any similar characteristic organ, which may not all be represented on the plant at one time. For example, the early spring root-leaves of the round-leaved hairbell (*Campanula rotundifolia*), which give it its specific name, are usually withered and vanished before the flowers appear, and yet they are eminently characteristic of the species. On the same part of every sheet—the lower left hand corner is perhaps the most suitable—should be written the name, place of growth, and date of collecting the plant. These particulars are indispensable, but others may be added, such as the class, and natural order, and the number in the London Catalogue—this is very desirable as a ready means of reference. Also any brief remark about the comparative rarity of the plant, either in the country or in the immediate district, the soil on which it grows, &c. It is a good plan to have a number of small labels printed with these headings, and only the blanks to fill in.* To prevent the attacks of mites, or the larvæ of

* A book of Botanical Labels, including one for every species and variety recognized at the date of publication, was issued a few years ago by the Editor of *The Young Naturalist*, and may still be had, price 5/-

insects whose ravages are often very destructive to the herbarium, it is a wise precaution to brush over the specimen with a solution of corrosive sublimate in spirits of wine, laid on with a camel's-hair brush at the time of mounting. It is also necessary in case any marauders may have escaped, or intruded at a later stage, to go over the whole of the plants at least once a year. Their depredations are easily detected from the dust left as the *debris* of their destruction. Camphor placed amongst the specimens may help to repel the attacks of fresh invaders, but as the eggs may have been laid in the plant before it was gathered at all, it is necessary to exercise a careful watch over fresh specimens.

In the permanent disposal of the specimen, a good deal depends upon the length of purse of the collector. Some prefer to enshrine them in tastefully bound volumes, an expensive, although, in certain respects, a very convenient fashion. Others again choose to keep them in loose sheets, in drawers in a cabinet prepared for the purpose, also very good if space is no object. But perhaps the most easily available plan is to enclose each natural order in a double sheet of stout brown paper, a little larger than the mounting paper, so that it can be folded over at the edges to exclude the dust, and secured with a pin or a string. Some of the larger natural orders may require to be divided into two or more parcels. But if they are each numbered, and the name of the order written on the outside, a plant is easily found when wanted.

Bishop Auckland.

APTEROUS FEMALES.

By C. B. CROSS.

Mr. Pierce has proved by the aid of the microscope that apterous is wrongly applied, as the word means entirely void of wings, but he has failed to prove they ever had fully developed wings.

Mr. Pierce ridicules the idea of the male carrying his wingless mate, and refers me to the house-fly carrying his mate. Now the house-fly is a poor illustration, as it is almost helpless in this position and easily captured, whereas these moths differ from all other lepidoptera, as any others are a sure prize when we find any of them in copula, but the four species I have referred to never seem fully alive but when paired, as they are easily taken when alone. I still believe they are as originally formed, and never had fully developed wings, but stumps. My opinion is that their wingless state is a provision in nature to keep the species within limits. Such breeding capacity, I may say such an egg-bag, to migrate at will, would soon make the species plagues, as

they deposit over three times the number of eggs of most other Geometers. I have seen large beech trees almost leafless from their destructive power. All things are created for a purpose, all things work together for good; therefore it is a blessing they are "helpless females" as Mr. Pierce terms them, and, I believe, they enjoy life as well as if they had ample wings.

I may say I have had some experience of *antiqua*, another of the species with minature winged females. One afternoon, on a sweeping ramble for larvæ, I went to a fine patch of heather three or four acres in extent. I commenced operations by two or three sweeps with my net, and looked at the contents. The result was I saw more *antiqua* larvæ in my net at one time than I should have considered a good afternoon's sweeping of mixed species. However, I emptied my net as I did not require them, nor did I know any one that did. I resumed operations again with the same result. In fact it was *antiqua! antiqua! antiqua!* and nothing else. The heath was alive with them, and I just ask you to imagine such a plague as this if the female could fly where it would.

The subject is the origin of apterous females. Take a crippled female of any other moth, the eggs do not produce cripples, far from it, the progeny always have fully developed wings. But if it be the case that those "helpless females" ever had fully developed wings, it would be reasonable to expect at least one of the brood to have imperfect wings. We have no record of such an occurrence, nor are we likely to hear of one.

Mr. Pierce says it is a knotty subject to solve—he has made little progress yet.

Glasgow, Nov., 1886.

EXCHANGE.

I do not think that "Omega" apprehends the real use of exchange; although some of the cases he cites are peculiar, they do not touch the point. Suppose a gentleman living in a city, closely engaged in business, with the exception of a short summer holiday, captures a quantity of a common species, or rears them, and that another collector similarly situated has caught a lot of another species equally common, obviously it is a mutual advantage to effect an exchange, neither being able to get the insect which the other possesses in plenty. Again, most entomologists only collect one particular branch, as Lepidoptera, and another Coleoptera. Why should not common butterflies and moths be exchanged for equally common beetles? It may be answered, get them for yourself. In the first place, that is out of the question, as either branch is

more than one individual can properly work unless he has plenty of time, and in the second place, the implements and methods of collecting are different. One who collects beetles and is working his district by searching under stones and bark, beating, sweeping and using the water-net, etc., is not likely to go out at night sugaring for moths, whereas catching moths at night may suit another exactly. I think there can be no doubt, that as the science is so vast there is quite room for specialists in its various branches, and for those to exchange their duplicates, however common they may be, must be a mutual advantage.

At the present day exchanging is not prosecuted sufficiently. I feel convinced there are lots of specimens in duplicate lying about, which would fill gaps in somebody else's collection. To effect this end it seems to me the best way is to cultivate the interchange of marked lists, now to be obtained so easily and cheaply, so that each may know what the other wants. Of course all idea of bartering, or effecting a good bargain is out of the question. Should there be any such person I would say to him give up the idea at once, for you will be soon detected, and your name passed round as one given to sharp practices, and hence to be avoided by all.—MUTUAL HELP.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 1st, 1886.—ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

Mr. W. H. Miskin, of Brisbane, Queensland (formerly a Subscriber), Mr. R. E. Salwey, of Folkstone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey Hills. The object of the exhibition was to show the variation of the species in connection with the geological formations of the various localities from which the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand Coleoptera, by Freiherr von Schlereth, which, though executed in pencil, were remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvæ collected by him near Windermere,

on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and consequently difficult for Mr. Murray to obtain, he had endeavoured to get the larvæ to feed on some other species of balsam, including the large garden species, usually known as Canadian balsam, but that he had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society on the subject of the habits of lepidopterous larvæ with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum* (Westw.), obtained from a greenhouse at Snaresbrook, where they had caused great havoc amongst tomato plants (*Lycopersicum esculentum*.) He remarked that the species had been first figured and described by Prof. Westwood in the "*Gardener's Chronicle*," 1856, and that attention had been recently called to it by Mr. Douglas (*Ent. Mo. Mag.* for December.) Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the blood of a pupa of *Smerinthus tilix*, and demonstrated, by means of a micro-spectroscope, the existence of chlorophyll therein.

Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (*Proc. Ent. Soc.* 1886, p. xxv.); and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Ypsipetes elulata* from Huddersfield, showing green, red-brown, and black forms.

Mr. S. Stevens exhibited forms of *Camptogramma bilineata* and *Emmelesia albulata* from the Shetland Isles, and a curious variety of *Chelonia caja* from Norwich.

Mr. H. Goss read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvæ and pupæ of certain species of Lepidoptera collected in Demerara.

Mr. M'Lachlan read "A Note concerning certain *Nemopteridæ*."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession, sent to him some years ago by Mons. Léfèvre, who had received them from the late Dr. Hammerschmidt, of Vienna.

A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood, and others, took part.

At the close of the Ordinary Meeting a Special Meeting was held for the purpose of considering certain proposed alterations in the Bye-laws. The proposed alterations having been explained to the Meeting, were, after some discussion, agreed to and the proceedings terminated.—H. Goss, Secretary.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

The Annual Exhibition of the above Society was held on the 25th Nov., at the Bridge House Hotel, London Bridge. The exhibits represented all divisions of both the animal and vegetable kingdoms. Among the exhibitors in the class Insecta, were Mr. M'Lachlan, F.R.S., with Exotic Neuroptera (dragon-flies, ant-lions, &c.), and jumping seeds from Mexico, containing larvæ of *Carpocapsa saltitans*, W. Mr. J. J. Weir, F.L.S., his collection of *Argynnis paphia* and other *Argynnidae*, including various forms and varieties; also various exotic silkworm moths, &c. The Zoological Society of London, various species of *Attacus*, including *A. atlas*, one having been reared at the gardens, the larva feeding on ivy. South African *Bombyces* and various species of *Papilio*, among which were *P. podalirius*, *P. alexanor*, *P. ajax*, *P. demoleus*, &c. All these insects were bred in the Insect House in the gardens, Regent's Park. Mr. R. Adkin, portions of his collection of British Lepidoptera, including the *Rhopalocera*, *Sphinges*, and *Bombyces*. Mr. W. Farren, of Cambridge, long and varied series of *Bryophila impar*; also a water-colour drawing showing the complete life history of *Papilio machaon*, with several varieties of the larva, pupa, imago. Mr. W. H. Harwood, of Colchester, a fine variety of *Arctia villica*, having the right forewing black and the other three normal. Mr. H. Murray, of Carnforth, six specimens of *Cidaria reticulata*, bred from larva found upon *Impatiens noli-me-tangere*. Mr. W. Warren, yellow forms of *Bryophila perla*, and varieties of *B. impar*. Mr. J. Jager, *Callimorpha hera*, and var. *lutescens*, from South Devon. Mr. G. P. Shearwood, three drawers of preserved larvæ and imagines. Mr. R. South, his almost complete collection of the *Pyralididae*, *Pterophoridae*, and *Crambidae*. Mr. Adye, of Christchurch, *Chærocampa celerio* and *Deiopeia pulchella*, from Bournemouth, and a number of other species and varieties. Mr. E. Anderson, nice forms of *Angerona prunaria*, and life histories of a number of species, the appearance of some of the wood-boring larva being very natural. Mr. J. A. Cooper, imagines and living larvæ of *Geometra smaragdaria*. Mr. J. Knight, hybrids between *Smerinthus ocellatus* and *S. populi*. Mr. G. Elisha, seven drawers of *Tineina*, the one containing the *Coleophora*

being especially noticeable. Mr. J. W. Tutt, comparative series of *Agrotidae* and of *Tephrosia crepuscularia* and *T. biundularia*, and a box of the latter species from Mr. Harrison, of Barnsley. Mr. Tutt also exhibited *Crambus cantiellus* (?), *C. contaminellus*, and allied species. Mr. F. Barclay, *Pachetra leucophaea*, three *Chærocampa celerio*, taken in 1885, and a variety of *Vanessa cardui*. Mr. O. C. Goldthwaite, *Chærocampa celerio*, *Sphinx convolvuli*. Mr. C. H. Williams, a case showing the life history of a number of species, including *Agrotis præcox*, and *Eriogaster lanestris*, the larvæ of the last being mounted on the silken web. Mr. H. S. Flemlin, *Agrotis ashworthii*. Mr. Hicklin, eighty species of moths taken in his garden, at Sidcup during the present year. Mrs. Hutchinson, examples of three broods of *Vanessa C-album*, and a species of *Eupithecia*, new to Britain. Mr. J. Smith, a white form of *Lasiocampa quercifolia*. Dr. Sequeira exhibited Lepidoptera from Central America. Mr. Bliss, Lepidoptera, &c., from the district of the Formosa River, and Dargeling, India. Mr. Edwards, Exotic Coleoptera, principally the genus *Goliathus*, Mr. Billups, British and Exotic Coleoptera, and British Hemiptera, Hymenoptera—Aculeata, Ichneumonidæ, and Diptera, the new method of setting and labelling the Hymenoptera being admired. Mr. Grut, F.L.S., Exotic Coleoptera: the *Cicindelidæ* and *Scarabœidæ*. Mr. West (Greenwich), twelve drawers of his collection of British Coleoptera, comprising the *Geodephaga*, *Hydradephaga*, *Lucanidæ*, *Aphodiidæ*, and *Telephoridæ*—the whole forming a most attractive exhibit.

Mr. B. W. Adkin exhibited cases of British birds; Mr. E. Cooke, eggs of British and Foreign birds; Mr. G. Day, an interesting collection of birds, shot, stuffed, and mounted by himself, chiefly from the southern and eastern counties of England. The specimens exhibited comprised examples of Accipitres, Oscines, Volucres, Grallatores, and Natatores. Dr. C. M. Matthews, an example of the Egyptian vulture (*Neophron percnopterus*), shot in Somersetshire, in 1825; Mr. W. A. Pearce, skins of birds from North America; Mr. F. D. Power, British birds, Snow Buntings (*Plectrophanes nivalis*), Blue Throat Warblers, and a case of Dunlins (*Tringa aldina*). Mr. R. Fortune, a most interesting collection of eggs and nests of British birds, containing many rare species. Mr. E. Step and Mr. J. A. Cooper, case of British birds' eggs, and the latter gentleman an example of the Great Grey Shrike (*Lanius excubitar*), shot near Epping Forest. The exhibits of Mr. Dawes, of Camberwell, comprising cases of birds, and mammals, and those of Mr. A. E. Cook, of Rotherhithe, birds and reptiles, attracted considerable attention. Mr. Manger exhibited a specimen of a giant crab (*Mæcaocheria kempferi*), from Nagasaki, Japan, this crustacean measuring six feet across. Mr. E. Step was the only exhibitor of British terrestrial molluca; and Mr. Winkley show-

ed a case of living reptiles, containing salamanders, American and English newts, &c. The vegetable kingdom was represented by the dried and mounted plants of Messrs. A. E. and W. A. Pearce, which formed a most interesting collection; as also did that of Mr. Hudson, who exhibited fourteen of the natural orders of the sub-class Corollifloræ. This gentleman also showed a collection of dried fruits, illustrating the various forms and methods of dehiscence. Mr. T. S. Davis, a case of seeds of special morphological interest, mounted and arranged for microscopical purposes. The Society was assisted by members of the Royal, New Cross, South London, Croydon, Hackney, and Queckett Microscopical Societies, and the Haggerston Entomological Society. The Exhibition was the most successful ever held by the Society, a result to a large extent due to the untiring exertions of the two Secretaries Messrs. Pearce and Barker.—*From our London Correspondent.*

December 2nd, 1886.—R. Adkin, Esq., F.E.S., President, in the chair.

Mr. W. Farren, of Cambridge, was elected a member.

Mr. Wellman exhibited examples of *Satyrus semele* and *Lycæna icarus* (*alexis*) from Ireland. Mr. Tutt, long series of the genus *Agrotis*, and for the purpose of comparison some specimens of *A. cursoria* and *A. aquilina*, from Mr. Percy Russ, of Sligo. In Mr. Russ's box were specimens of *Epunda lutulenta*, vars. *luneburgensis*, Fr., and *sedii*, Gn. Mr. Tutt contributed some observation on his exhibits. Mr. Adye, varieties of *Hemerophila abruptaria* and *Epinephele janira*. Mr. R. South, species of Rhopalocera, from the Amor Valley, Siberia. Mr. Adkin, *Cidaria reticulata* and varieties of *Sarothripus undulana*, Hb., from the New Forest. Mr. Tugwell, a number of insects from New Caledonia, among them a specimen of *Charocampa celerio*, similar to the type found in this country. Dr. P. Rendall, *Vanessa antiopa*, also a specimen of *Noctua festiva*, var. *conflua*; a discussion ensued as to whether *conflua* was a distinct species or not. Mr. Hall, a specimen of the Great Green Grasshopper (*Locusta viridissima*), taken at sugar. Mr. Tugwell stated he had frequently seen this species at sugar on the sand hills, Deal, and in his opinion it came there for the purpose of feeding on the moths that were attracted to the sugar, as he had often noticed them make a meal of as large an insect as *Phlogophora meticulosa*. Several other members contributed remarks on Mr. Hall's exhibit. Mr. Billups exhibited a species of Coccidæ (*Aleurodes vaporariorum*), West., from a greenhouse, at Snaresbrook, Essex, December 2nd, on the leaves of tomato (*Lycopersicum esculentum*), where it had been doing an immense amount of damage. He stated the species was first described by Professor Westwood, in the *Gardeners' Chronicle*, for 1856, but for a later description he would refer members to the *Entomologists' Monthly Magazine* for December, where it was described by Mr. J. W.

Douglas, to whom he indebted for the identification of the species. Mr. South read a short paper on "British Snake-like Reptiles."

December 16th, 1886.—The President in the chair, the following gentlemen were elected members, Mr. F. W. McDonald, Mr. C. A. Briggs, F.E.S., Mr. T. H. Briggs, M.A., F.E.S., Mr. W. L. Distant, F.E.S., Mr. H. Hutchinson, Mr. J. A. Clark, F.E.S., Mr. G. Skinner, and Mr. C. S. Bouttell.

Mr. Adye exhibited *Sphinx convolvuli* taken at Christchurch 1875, and he remarked that although he had been out about 40 nights during the past autumn, he had not seen a single specimen of this species; Mr. Adkin, on behalf of Mrs. Hutchinson, a male specimen of *Stauropus fagi*, having female antennæ; Mr. Billups, three species of Ichneumonidæ, new to Britain, viz. *Bassus bizonarius*, Gr, taken in his garden at Peckham, May, 1885; *Erromenus* (*Trichocalymma*, Foerst.) *plebegum*, Wolds., taken at Dulwich, June, 1885; *Perilissus triangulatus*, Bridgm., the male from Peckham, and the female from Dulwich, May, 1885; Mr. Billups stated he was indebted to his friend Mr. J. B. Bridgman, for the identification of these species, which he had fully described in a paper read before the Entomological Society of London, July 7th, 1886, and printed in the Society's Transactions for 1886. Mr. W. West exhibited eggs of the Emu.

The Secretary then read the Council's Report, and the Treasurer an abstract of his accounts for 1886. The Election of Officers for 1887 was then proceeded with and resulted as follows: Mr. R. Adkin, F.E.S., President; Mr. R. South, F.E.S., Vice-President; Mr. E. Step, Treasurer; Mr. Chaney, Librarian; Mr. W. West (Greenwich), Curator; Mr. H. W. Barker, Secretary; and Messrs. T. R. Billups, F.E.S., J. T. Carrington, F.E.S., W. A. Pearce, W. H. Tugwell, J. R. Wellman, W. West, I.D.S., and J. Jenner Weir, F.L.S., F.Z.S., F.E.S., Council.—H. W. BARKER, Hon. Secretary.

HAGGERSTON ENTOMOLOGICAL SOCIETY.

The meeting of December 2nd was very well attended, the exhibits being principally by Mr. Clark; a very fine bred series each of *A. imitaria*, *M. galitata* and *A. derivata*. Several members mentioned that they had taken *H. aurantiana* and had seen *H. brumata* unusually abundant. This being the half-yearly meeting, the business of the Society then commenced with the election of officers for the next six months. Mr. T. Cooke was elected President and Mr. Hockett Vice-president. Mr. Anderson, the Secretary, having intimated that he was reluctantly obliged to resign the office of Secretary, on account of pressure of business, Mr. Russell was elected to fill that office, with the assistance of Mr. Anderson. The remaining Officers were re-elected without opposition,

On December 9th, the exhibitions were by Mr. Clark, specimens of *C. exulis* and *S. musculosa*; Mr. Coomber, *Carabus catenulatus* and *Anchomenus junceus*; Mr. Dennis, a very variable series each of *H. aurantiaria* and *H. defoliaria*. Several donations were made to the Society's cabinet, including specimens of *N. citialis*, by Mr. Cooke. It was proposed that on the following Monday the members make an excursion after the usual species of *Hybernia* now out.

December 16th. Mr. Harper brought up a very fine series of *T. w-album*, to illustrate the discussion on that species. Mr. T. Cooke, specimens of *N. conformis* (both English and Foreign) for comparison, and a very suffused form of *A. fuliginosa*, also a specimen of *P. illustris*, said to have been taken at Wisbeach. Mr. Pearson drew the attention of the members to an article in the *Young Naturalist* on *P. dispar*, giving an account of the European types. Mr. Harper, on behalf of the members who made the excursion on Monday, the 13th, stated that both *H. aurantiaria* and *H. defoliaria* were seen in great abundance, and Mr. Clark took a female *H. defoliaria* in copula with a male *H. aurantiaria*; others species not noticed. Mr. Harper then introduced the discussion on the life history of *T. w-album*; ova laid in August on elm, hatching the following spring, the best time for the larvæ being from the 10th to the 20th of June, and the method of finding them is by searching the undersides of the leaves; he used to take the larvæ some years ago at West Wickham, but had not taken the imago there, it occurred at Croydon and at Raindean. Mr. Hockett observed that his experience was that of Mr. Harper, he had beaten for it and taken it. Mr. Pearson had seen this species at Gravesend. Mr. Cook knew of two specimens having been taken at West Wickham last year. Several members observed that it seemed a rather local species in the South of England.—J. RUSSELL, Sec.

CLYDESDALE NATURALISTS' SOCIETY.

The usual monthly meeting of this Society was held on Wednesday evening, 8th December, in the Society's rooms, 207, Bath Street, Glasgow. Mr. T. J. Henderson, President, in the chair. Mr. James Jack, Block Street, Airdrie, was elected a member of the Society. A motion was submitted by Mr. Robert J. Bennett, proposing to alter the date of meeting from the second to the third Wednesday of each month, which was unanimously agreed to by the members. Some discussion took place as to the propriety of having a supper soon in connection with the Society, and a committee was appointed to carry out the necessary arrangements. Mr. Alex. M. Stewart exhibited a number of rare lepidoptera, mostly taken in the neighbourhood of Paisley, including *Plusia bractea*, *M. furva*, *B. torquatella*, *S. coniferana*, *Bouchar-*

dana, &c. ; he also showed fine specimens of *Plusia orichalcea*, *v-aureum*, *iota*, *interrogationis*, *festuæ*, *Z. exulans* (from Braemar), *A. strigosa*, *alni*, *L. testudo*, *M. alternata*, *C. fluviala*, *M. arcuosa* (females), and striking varieties of *C. suffumata* and *M. strigilis* ; his box also contained a beautiful series of *C. russata*, from North Knapdale, and, for comparison, a series of the pretty Arran variety. Mr. Stewart exhibited specimens of the egg of the rare Capercaillie, found in the North of Scotland. Mr. J. Bennett Browne exhibited a large number of specimens of birds and eggs, most of which were taken in the neighbourhood of Garelochhead, and regarding which, a very interesting paper was read. Mr. C. B. Cross showed a case of moths, with beautiful preserved specimens of the larva of each species, which had been arranged and forwarded for exhibition by Mr. F. N. Pierce, of Liverpool, a corresponding member. The caterpillars were very neatly mounted on wire, and presented quite an artistic appearance. The natural colouring of the larvæ were also fairly well preserved, and showed that the mode of treatment used by Mr. Pierce is a very successful one. Among the species represented in the exhibit may be mentioned *N. dromedarius*, *O. fascelina*, *A. gemina*, *N. cucullatella*, *E. lichenea*, *T. piniperda*, *C. spinula*, *B. perla*, &c. Mr. Cross also showed a specimen of the short-tailed Mouse (*Arvicola agrestis*), taken in the district. Mr. George E. Paterson exhibited a pair of magpies, each of which, curiously, when captured, was found to have had one of its legs maimed. Mr. E. C. Eggleton handed round for inspection a box contained a fine series of *Sesia bembeciformis*, bred from larvæ found in the trunks of old sallows in Kelvingrove Park. Mr. T. J. Henderson read a very interesting paper—"Notes on Lepidoptera, season 1886,"—in which he gave a brief resumé of his collecting experiences during the past season. The essayist had to complain about a good many things, all of which tended to make the past season disappointing to the entomologist. He had to grumble about the lateness of the season, the cold, bleak weather, and above all, the scarcity of insect life. In his opinion, the past season was in many senses a failure. Mr. Henderson, in his paper, also touched upon the subject of the retarded emergence of some species of lepidoptera, and the various atmospheric and other influences which tend to bring this about. Another very interesting paper was read entitled "Pupæ," contributed by Mr. Joseph Anderson, Junr., Chichester, a corresponding member. The paper was a most comprehensive one, and presented in a condensed form, a pretty accurate account of what is generally known regarding the shapes and peculiarities of the many kinds of pupæ. A vote of thanks to the exhibitors and essayists brought a most interesting meeting to a close.—JOHN MACKAY, Hon. Secretary.

PUBLICATIONS RECEIVED.

The Hessian Fly in Great Britain.

Miss Ormerod has proved far too satisfactorily, that this destructive scourge has made its appearance in Britain, but it scarcely appears likely to do so much damage to our cereals as it has done elsewhere. The Hessian Fly (*Cecidomyia destructor*) is double brooded, emerging in May, and August or September. Those emerging in May, lay their eggs so that the larva when hatched, shelters itself between the stem and sheath just above the first or second joint from the ground, and there it remains sucking the juices of the plant until it is so weakened that the stem falls over, bending at the injured part. The autumn brood lay their eggs on the young leaves, and the larva make their way down to the base of the leaf, or crown of the root, where they fix themselves, and suck the juices of the plant until they are full-fed, and the young plant turns yellow and dies. Autumn sown wheat is generally so late in appearing (in this country) that the flies are for the most part dead before it is up. Miss Ormerod recommends where it is attacked, that it be "ploughed in, with the eggs and maggots." One farmer, Mr. Palmer, of Revell's Hall near Hertford, allowed the self-sown barley in his worst infested field, to sprout, then he had it eaten off by sheep, which would devour the leaves with the eggs on them, and any that might have hatched, and the maggot got too far down to be eaten off, were destroyed by being ploughed in. Late sowing, later than usual, appears to be the best course to adopt in this country, to get rid of the larva producing the spring brood. All interested in Economic Entomology will do well to procure Miss Ormerod's pamphlet.

NOTES ON LEPIDOPTERA.

By B. LOCKYER.

DIPHThERA ORION.—Rather common at sugar, and at rest on oak trunks in most of the woods and plantations in the New Forest, between 1873 and 1875. The larva unusually common in the autumn of 1874. Saw one beaten from beech.

ACRONYCTA PSI.—At sugar, and at rest on trunks and palings. June to August, in gardens and plantations about North London, Yarmouth, and the New Forest.

A. LEPORINA.—At sugar in July. The larva commoner than the moth, very delicate, and subject to the attacks of a fine black scarlet-banded Ichneumon, emerging in June. Birch copses in the New Forest.

A. ACERIS.—At rest on trunks of trees at end of June; also at sugar as late as July 2nd. Gardens and lanes round North London. Full-fed larvæ on trunks and palings near the food plant in the autumn.

A. MEGACEPHALA.—At sugar, and at rest on trunks of poplar in June and July. About North London among the poplar and aspen in gardens and fields. The larva rather common on upper side of the leaves in the Autumn.

A. ALNI.—Larva rare in the New Forest on birch, beech, and willow, August.

A. LIGUSTRI.—One larva on privet near Chepstow, Monmouth. August.

A. RUMICIS.—At sugar (August) in the New Forest. The larvæ, from as far south as Birkenhead, Cheshire, are full-fed in the autumn, and the imagines emerge in May. This is another larva that should not be confined under leno.

LEUCANIA CONIGERA.—Once at sugar, Highgate. July.

L. TUREA.—At sugar. Rather common. Denny Wood, New Forest, also Holland's Wood. July.

L. LITHARGYRIA.—Rare at sugar. Bishop's Wood, Southwood, and New Forest. July and August.

L. EXTRANEA.—Saw the specimen captured in March, 1875 (on Hurst Hill Inclosure, New Forest), the morning after it was taken by Mr. Parker. At sugar.

L. COMMATA.—Once at sugar. Bishop's Wood, Hampstead. June.

L. PALLENS.—At sugar and light. July, August, and beginning of September. Highgate, Hampstead, and Southend, Essex: also New Forest.

NONAGRIA TYPHLE.—Occurred among bull-rushes in a large pool in the southern part of Holland's Wood, overhung by one of the finest willow bushes near Lyndhurst. August.

HYDRÆCIA NICTITANS.—Rare at sugar. Park Ground Inclosure, Lyndhurst. August.

H. MICACEA.—Males and Females on flowers of rumex, by night in a rank pasture. August. Not common. Camden Town, London.

XYLOPHASIA RUREA.—One specimen only at sugar. Bishop's Wood, Hampstead. June. Rare at Lyndhurst. Teste G. Tate and G. Gulliver.

X. LITHOXYLEA.—Rather common at sugar, also on palings. June and July. Bishop's Wood, Highgate Wood, Wood Green, and near Barnet, and New Forest.

X. *SUBLUSTRIS*.—Saw one captured at sugar, in Bishop's Wood, Hampstead. June, 1870.

X. *HEPATICA*.—Not very common at sugar. Bishop's Wood, Hampstead, Highgate Woods (rather common in 1875), and about Lyndhurst. June and July.

X. *SCOLOPACINA*.—At bramble bloom, also at sugar. Abundant, but local, in certain "rides" in Bishop's Wood and Highgate Wood (the lower or "Southwood." July and beginning of August.

NOTES AND OBSERVATIONS.

ARCTIA MENDICA.—I would gladly learn if any entomologist, who has bred or taken *A. mendica* in Ireland, has found the male differ in colour from the smoky black form so familiar to English collectors? In the summer of 1885, a kind correspondent sent me ova of the above species from Cork, they soon hatched and the larvæ fed up quickly on dock and nettle. They were most voracious, requiring their cage replenished daily. This being neglected one busy day, when the larvæ were nearly full-fed, they ate their way through the calico, and nearly all escaped. The sorrow was lessened by the feeling "it was fortunate they were only *mendica*." The few larvæ remaining in the cage were taken good care of.

Early in last April I received a letter from my kind correspondent telling me the same batch of ova he shared with me were producing him *creamy* and *smoky-white* males, and he wished to know if mine were coming out the same unusual colour. Mine did not emerge till fully a month later, but when they did so the males were all creamy or smoky-white, and the females had very few spots of black on them, and were very different to any English ones I have ever seen. Eggs were obtained, and it is needless to say the larvæ were better taken care of this summer. The result is anxiously looked forward to. Is it possible this is a new species, nearly allied to *A. mendica*?—G. S. HUTCHINSON, Grantsfield, Leominster.

[This is undoubtedly the variety *Rustica*, of Hubner (1790), and which is doubtfully reported as having occurred in the Eastern part of Hungary. I have also heard a rumour of its being taken in Ireland before. Mrs. Hutchinson has kindly presented me with a pair, the male creamy-white, the female nearly immaculate. My own opinion is that this is the original form of the species, and that from cause or other the male has assumed the well-known smoky hue. The variety *Hethlandica*, of Humuli, is another case in point, though the cause of the change there is not far to seek.—J. E. ROBSON.

V. C-ALBUM.—On April 26 I caught a fine *V. c-album*, flying over some currant bushes, and was fortunate enough to obtain a good many ova, which were laid between April 27th and May 6th, always in the bright morning sunshine. The eggs hatched between May 5th and 11th, and the larvæ fed on currant and nettle mixed, and were full-grown from June 17th till the 23rd. The first butterfly emerged on June 26th, and the last on July 3rd, and all were very fine and of the pale summer variety. Two of the insects paired on June 30th, and the female commenced laying on July 1st, and continued doing so till the 10th, when there were 120 ova. Unfortunately, a very cold spell of weather began on July 12th, and more than half the eggs perished in consequence. The seven eggs laid last all hatched in some bright sun on July 15th, while a few of the earlier ones kept hatching till the 18th. The larvæ were divided, and one lot fed on currant and the other on nettle. The butterflies emerged from August 17th till the 27th. Those fed on currant were decidedly finer specimens, but all were considerably paler than the type. Several pairs were put together, but no ova were obtained. This beautiful butterfly has been common this year, and wild pupæ were found in July, August, September, and October. Several larvæ in the last two months were found in the hop-yards by the pickers, the last butterfly appearing on October 27th. Does not this prove beyond doubt that the insect is at least treble-brooded?—(Miss) E. HUTCHINSON, Kimbolton, Leominster.

PLUSIA GAMMA, V. ATALANTA, AND CARDUI.—The chief entomological event here during the past season worthy of recording has been the extraordinary abundance of *P. gamma*. I have never seen it in anything like such swarms since 1879. A fuchsia bush in our garden was one living grey mass of the moths, and every bloom of single dahlia had two or three on it; quite a loud hum was made by the vibration of their wings. Its companion of 1879, *V. cardui*, has been entirely absent this year; I have not seen a single specimen, 1884 being the only year when it was again plentiful. *V. atalanta*, which first appeared here in any numbers in 1884, was fairly plentiful this year, but I saw very few in 1885.—(Miss) K. M. HINCHLIFF, Instow, N. Devon.

DO LARVÆ HEAR?—Mr. J. R. S. Clifford, in his observations on “The peculiarities of *Orgyia gonostigma*,” page 255, Vol. vii., says that the larvæ are startled from their food by noises. Further on he adds, “I know the frequent popping on shooting days was far from favourable to the increase of some of the choice lepidoptera,” &c. I should like to know if it is Mr. Clifford’s opinion that these insects can hear, or whether he thinks they are affected by the vibrations caused by sound?—ISABELLA LINNELL, Hillsbro’, Red Hill, Surrey.

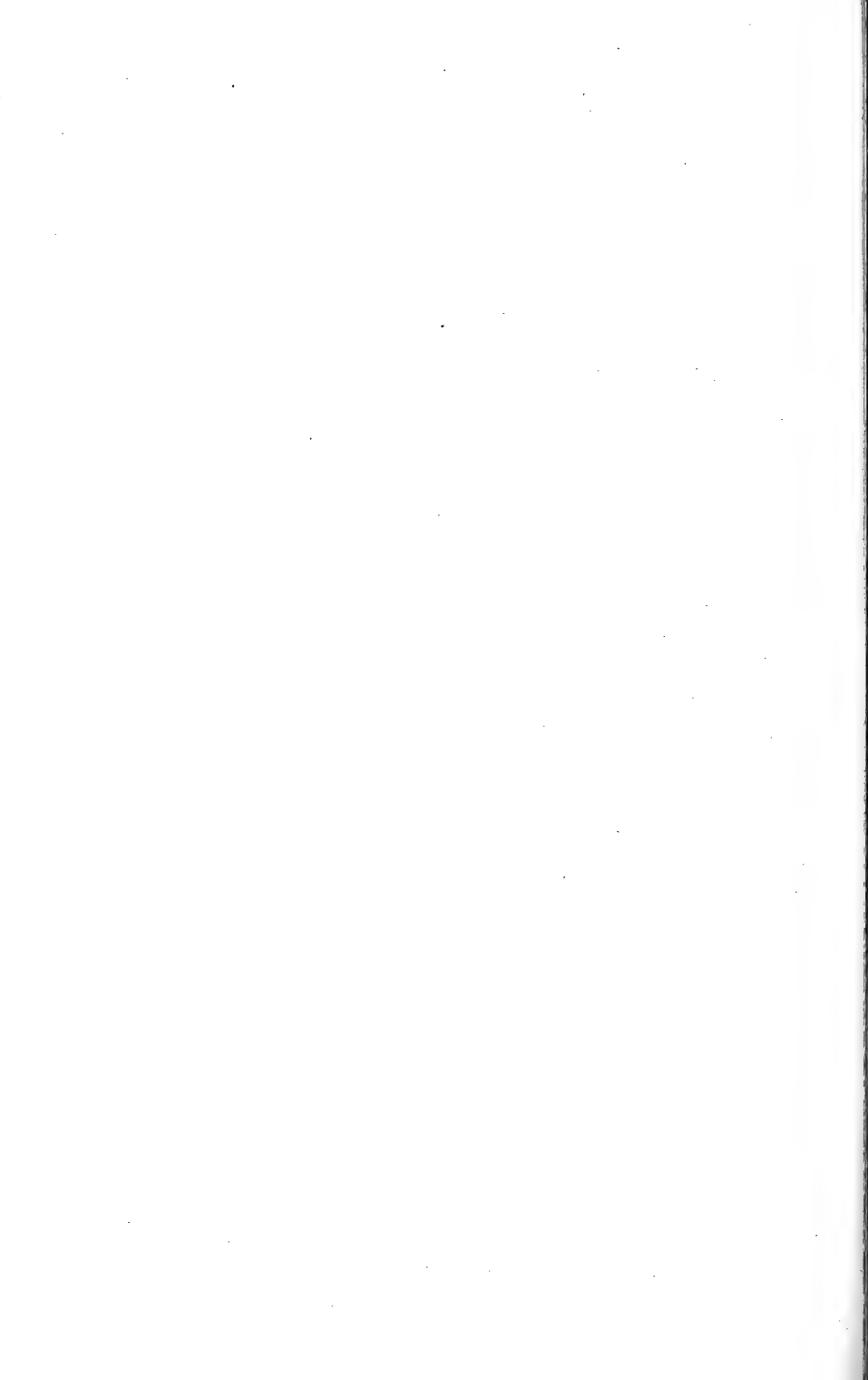
“THE YOUNG NATURALIST”

List of British Lepidoptera.

The last sheet of the first portion of this list is now in type, but before issuing it we would be glad to correct any error or omissions that may have been detected in it. *L. asellus* and *T. populeti* accidentally dropped from the form, at bottom of pages 10 and 20. Any other error or omission we will be glad to have notified during the current month, that they may be corrected at the end of the sheet which will be issued with the February part.

JOHN E. ROBSON.

JOHN GARDNER.



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FIELD-WORK FOR LONDON LEPIDOPTERISTS IN FEBRUARY AND MARCH.

By ERNEST ANDERSON.

TOWARDS the end of the present month, the lepidopterist may fairly expect to commence active field-work, and this renewal of old habits and associations is always most enjoyable after the dull monotony of the winter months, when very little can be done, except indoor work, such as arranging and classifying our captures of the previous season.

For London lepidopterists, Richmond Park is generally considered the most convenient and productive collecting ground at this time of the year. In the first place it is the head-quarters in our district of *Nyssia hispidaria*, a species which maintains its reputation of being very difficult to secure in consequence of its uncertain appearance, many lepidopterists having searched in vain for it, season after season. It varies in its time of appearance from the middle of February to the middle of March, though rarely being so late as the latter date. Judging from the observations made, this species must emerge as it were in a body, that is, almost the whole generation leave the pupal state simultaneously, say in a period extending over about three days. It is owing to this fact that the insect is so hard to procure, as by missing these three or four particular days all chance of obtaining it is gone, as they rarely settle on the trunks again after having once flown, but prefer the large boughs of the oaks, which are, of course, inaccessible to the entomologist. Should the visitor, however, be fortunate enough to hit upon the exact period of their emergence, he will have no difficulty in observing the males of this very interesting species, as they are drying themselves on the lower boles of the large oak trees. The female which is apterous, is far more rarely seen, and is only to be obtained by very careful examination of the clefts and crevices of the bark. Most of our leading London lepidopterists visit the locality

in search of this pretty and distinct-looking little moth, and as many as twenty or thirty persons may sometimes be seen diligently searching the trees in all directions, much to the astonishment of the ordinary observer.

Hispidaria is also found in Epping Forest, but owing to the wet state of the ground, usual at this time of the year, it is seldom searched for or obtained from that locality. Brentwood is also a favourite locality.

Amongst the other species to be found at Richmond, *Hybernia leucophearia* must be considered the commonest. This pretty species well deserves the name of "Spring Usher," as it may always be observed by the 13th or 14th of February, remaining out about three weeks. It is also procured from many other localities round London, and is found resting upon trees, fences, &c., also coming freely to light. These remarks, of course, apply only to the males, the female being apterous, and consequently is much less commonly observed. *Hybernia progemmaria* is the next species on our list. It appears and remains on the wing somewhat later than *Leucophearia*, but otherwise the remarks made upon that species apply equally well to the present one. The female is apterous, but has the rudimentary wings developed to a higher degree than any other of the group.

On fences and palings, about the first of March, may be observed specimens of *A. æscularia*, the "March Moth" or "Crosswing," so called on account of the peculiar way in which the wings are folded when the insect is at rest. The males are usually very abundant, but the female is perhaps the rarest of the apterous group; male specimens may be obtained throughout the month.

In January, the erratic *P. pilosaria* first puts in a straggling appearance, the main body being out about the middle of February. It is fairly abundant in most localities, and like all the other species enumerated is to be obtained from trees and fences. The apterous female is distinguished from that of *Hispidaria* by its lighter colour, and by having the legs plain, *Hispidaria* having them hairy or tufted.

I have now mentioned most of the species which are to be met with certainty at this time of year. Occasionally, specimens of *A. prodromaria* are met with, but the proper time for the appearance of this insect is the end of March and beginning of April. On fences round birch plantations, and sitting on the birch twigs *C. flavicornis* may frequently be observed, it also sometimes flies in the sunshine with a headlong sort of flight, which generally terminates by the insect pitching on to the ground and there remaining, and from its inconspicuous colouring, it is difficult to find under these circumstances.

Multistrigaria may occasionally be found at the foot of fences, and it comes

to the sallow catkins, at night. These blooms also prove very attractive to many species which have hibernated, and also to *Tæniocampa cruda*, *stabilis*, *instabilis*, *munda*, *gothica*, and a few others. By spreading a cloth or holding a beating tray underneath, and then shaking the bushes, most of these species are readily obtained, as, upon the slightest alarm they feign death, dropping down from the catkins and remaining motionless; hence they are very easily boxed. Of course this operation must be performed after dusk, the catkins being unproductive to the lepidopterist in the day time, except when they occur in large birch plantations in which case the lively *Brephos parthenius*, or "March high-flyer" may be expected on the wing during the first, bright, sunny, March days. As their name implies, they fly rather high, and it is advisable to have a moderately long stick to the net when wishing to procure specimens for the cabinet. Our list is now almost exhausted, but two more species may be found in Pine woods, viz.: *Trachea piniperda*, and *Tephrosia crepuscularia*; the former rests upon the pine trunks and in the thick foliage, also coming to sallow catkins at night, the latter is always observed resting upon the pine trunks, and from its large size and light colour, is very conspicuous even at a distance. It is very common, three and four frequently being observed resting upon one trunk; the base of larch trees seeming to be their most favourite position.

The Micro-lepidopterist can add still further to our list, in the March Dagger moth (*Chimabacche fagella*) and *Tortricodes hyemana*, the former, which has a semi-apterous female, is found on fences and oak trees, while the latter is found in the same situations, and also flying in the sunshine, and resting on the withered brakes, which they exactly resemble in colour.

Having now enumerated all, or nearly all of the species which are to be obtained in the perfect state, at the present season near London, it remains to remind my readers that on warm evenings in March, many larvæ may be obtained feeding upon grasses and low herbage: by rearing these, the lepidopterist obtains in a short time, and with very little trouble, many species of Noctuæ, and a few Geometræ. The sallow catkins should also be carefully collected and kept rather moist, and in due time the larvæ of *Xanthia cerago* and *silago*, will be observed upon them. These larvæ should then be removed and supplied with shoots of sallow or willow, and they will very soon go under ground, but, as they do not change into pupæ for about two months after that, they should not be disturbed. *Eupithecia tenuiata* is also bred from the sallow catkins, but the larvæ being small, are not frequently seen: the catkins should therefore be kept in a case, and watched in May for the insects (if any) to appear.

By beating fir trees, the larvæ of *Thera variata*, *firmata*, and *Ellopiia fasci-*

aria, may be procured. *Thera variata* is easily reared, remaining in the pupal state for a fortnight: the others on account of their taking some little time in feeding up, are more difficult to rear. All three go to pupæ amongst the fir needles, and consequently there is no occasion to give them earth.

The foregoing remarks will serve to prove that ample field work is now before us, and I trust that some of my readers will be able to give the result of their observations upon some of the species mentioned, in an early number of this magazine.

SCARCITY OF BUTTERFLIES IN THE NORTH OF SCOTLAND.

BY JOHN MACKAY.

My attention was directed to the following letter which appeared lately in the *Glasgow Herald*, and as it has an important bearing on the much disputed subject of the growing scarcity of butterflies, perhaps it may interest some of your readers:—

BUTTERFLIES AND MOTHS.

Fernfield, Bridge of Allan,

3rd November, 1886.

SIR,—During the past ten years I have carefully observed that in this neighbourhood butterflies and moths are becoming every year more rare. Besides the common white and nettle butterfly, I have years ago caught in my garden the Orange Tip, the Oak, the Painted Lady, the Peacock, the Red Admiral, the Camberwell Beauty, &c., and many rare moths, which are now not to be seen except rarely. I should like to know if this state of matters in regard to butterflies and moths is general over the country? If so, can a cause be assigned? Perhaps some of your numerous scientific readers may be able to throw some light on this interesting subject.—I am, &c.,

ALEX. PATERSON, M.D.

My experience of lepidoptera, unfortunately, does not go back into the good old times of ten years ago, when, according to Mr. Paterson, one had only to go out into his garden and net at his leisure such "good things" as Camberwell Beauties, and what are quite as rare here, Peacocks and Orange Tips. I fancy I see some of my Southern friends smile on reading this, these latter species being so common almost everywhere in the South. I believe *V. antiopa* has been recorded as having been taken somewhere in Scotland, but it is certainly a surprise to hear that it has been taken so far north as Stirlingshire. At anyrate it has not been taken, to my knowledge, for a good many years past in Scotland, except in this instance, and its record, although somewhat out of date now, is at least worth knowing. *A. cardamines* and *V. Io* are also now considered here things of the past, and

their record serves only to remind us of what "once was, but not likely again to be." Neither of these species has occurred, to my knowledge, North of Glasgow for a considerable period, although they were frequently met with when the summers were believed to be more pleasant than they are now. I do not know to what species Mr. Paterson refers as the "Oak" butterfly, unless it be *Thecla rubi*, which occurs in some parts of the Highlands. Can any of our older entomologist friends inform me? They seem to have had common names for each species, about which we of a younger generation know next to nothing. In an article which appeared in an Helensburgh paper sometime ago, seemingly written by an entomologist of the "Old School," a list of local butterflies was given, and among other queer names applied to the Diurni appeared that of the "Devil!" Will anyone who had the good (or bad) fortune to effect his capture give us an idea of his appearance? Did he, in one state, feed on thistles? But to return to my subject. The Painted Lady may still be met with in Arran and other favoured localities, but not commonly. *V. atalanta*, I am inclined to think is becoming in this district more common each year. It has been seen flitting about even in the centre of the city. Two or three years ago I remember collecting on the outskirts of the town, and while so engaged, was interrupted by a gentleman asking me questions. In the course of his remarks he said that he had seen a specimen of *V. atalanta* captured at Rutherglen, a most extraordinary capture he thought, as also did the entomologist who effected it. So that this and other facts point to this species at least being on the increase, while other species are rapidly becoming rarer. I suppose this district is not the only place where this process of extermination among the Diurni is taking place. I expected that some correspondence would have taken place on this subject in the columns of the *Herald*, but, unhappily, none replied to Mr. Paterson's letter. I wait with interest to hear from some of our older entomologists what species enjoyed the names of the "Oak" and the "Devil!"

Glasgow.

NOTES ON THE EUPITHECIÆ OF CLYDESDALE.

(Read at a meeting of the Clydesdale Naturalists' Society)

By T. J. HENDERSON, President, Clydesdale Naturalists' Society.

In these notes there is no pretence to an exhaustive list of the Eupitheciæ of this district, and they aim at little more than a record of my own experience. The Eupitheciæ, or "pugs" as they are familiarly called, is generally

considered one of the most interesting genera amongst the geometræ, besides being the most numerous in species. The genus is one of the best defined, even the comparative beginner seldom having any difficulty in recognising a pug when he sees it, although the species may be new to him. They are insects of small size compared with most of the geometræ, and characterized rather by neat markings than brilliant colouring. They are fond of resting on palings and trunks of trees, invariably resting with the wings spread out. They appear rather early in the season, the bulk of the species from May to July in this district, though I have observed a considerable discrepancy between the time given for appearance in England, and the actual occurrence in the North here; several species being at least a month later in this district.

The total number of species in the genus according to the latest List of British Lepidoptera, is 50. They do not appear to be specially well represented in this district, the species given in the West of Scotland Fauna, numbering 18, and of these, one is at least doubtful as a district species, but as that publication was drawn up some ten years ago, we could show a better muster now. I think I can myself answer for nineteen or twenty species from one or two localities in the district, of which I find that seven do not appear in the "Fauna." Several of the heath-feeding species are very abundant in their particular localities, and present considerable variation in intensity of colour and markings.

I shall now briefly notice the species that have come under my observation in the district.

E. pulchellata. I only once took a single specimen of this pretty species at the beginning of my collecting, but it appears to be not uncommon at our coasting places, and should of course be looked for near its food-plant, the fox-glove.

E. centaureata appears to be getting gradually more plentiful in our neighbourhood. I have come across it at Hillhead, Kelvinside, and Garelochhead. Its light colour makes it a very conspicuous object at rest on the dark trunk of a tree.

E. subfulvata. One specimen at Garelochhead two or three years ago. This species is easily identified by the large reddish blotch in the middle of the fore-wings.

E. subumbrata. A single specimen at Garelochhead in 1883.

E. plumbeolata. I came across this species a few years ago in a small wood or copse at Garelochhead, to which it appears to be strictly confined in that locality, its food-plant (*Melampyrum pratense*) being very plentiful in

the spot where the moth occurs. I have seen specimens in the possession of some of our members, taken at other localities in the district.

E. pygmaea. I can only speak to two specimens, one on a paling at Hillhead, but if I am not mistaken this species occurs in some plenty in the neighbourhood of Paisley.

E. helveticaria and *arceuthata* occur amongst the juniper, near Milngavia, one of the two or three localities in Britain. My experience is very limited, but I am strongly inclined to think these are but varieties of one species, and I see that in South's Catalogue *arceuthata* is given doubtfully as a variety of *helveticaria*.

E. satyrata occurs in the heathy part of Cadder Wilderness, where in sheltered corners it appears in large numbers.

E. castigata is nearly allied to *satyrata*, but seems to be more of a garden insect. It occurs at Garelochhead, but does not appear to be very plentiful in the district; possibly it is overlooked to some extent, being a rather obscurely marked insect, not easily separated from some of its congeners.

E. fraxinata. Last year I fell in with two specimens of this local species on a paling at Hillhead, and Mr. Cross, one of our members, lately submitted another for identification. As its specific name denotes, the larva feeds on the ash, and the perfect insect should be looked for in the neighbourhood of that tree.

E. indigata, another local species, is to be taken in Cadder Wilderness. The moth has the peculiarity of always appearing as if worn, even when just emerged from the chrysalis.

E. nanata is perhaps the commonest species of the genus in the district, occurring I think wherever there is any extent of heath.

E. vulgata appears to be generally distributed, but notwithstanding its name seldom occurs in any great numbers. It frequents gardens, hedgerows, &c., and may often be taken at rest on palings. A very dark suffused variety is sometimes met with in the neighbourhood.

E. absynthiata, *minutata*, and *assimilata*. I group these three together, owing to the difficulty of always being quite certain as to the identity of particular specimens. All three, I believe, occur in the locality, *absynthiata* being apparently the commonest.

E. lariciata, although never common, appears to be widely distributed, not only over this district, but over all the Kingdom; and it seems strange that it escaped observation as a separate species till a few years ago. I have taken it rather sparingly at Garelochhead, and I think some of our members have it from Cadder Wilderness.

E. abbreviata. A single specimen at Garelochhead, last May, is my sole record of this species, though I have seen other specimens in the possession of some of our members.

E. pumilata, I have taken commonly at Garelochhead, that is in one or two particular spots under favourable atmospheric circumstances, which leads me to hazard the general remark that the young collector must not be disappointed if he does not always find a species in a locality where it is said to occur even commonly, as many species are almost confined to particular nooks and corners and further do not shew themselves at all unless the weather is quite to their mind, and we all know what an uncertain quantity the weather is in this corner of the globe.

E. rectangulata. Garelochhead is again my only locality for this species. The larva feeding on the apple tree; is strictly a garden insect. The coloration of the perfect insect varies considerably, the typical green being occasionally almost invisible under blotches of blackish colour (*v. nigrosericeata.*)

As I mentioned at the beginning of these notes, I have confined my observations to the species which have come under my own notice in the district, but doubtless there are a number of others to be found.

HINTS ON PRESERVING PLANTS.

BY THE REV. T. H. PRESTON.

Would you allow me to make a few remarks in connection with Mr. Soutter's "Hints on Preserving Plants." I was much struck with the wonderful manner in which Krattli, the Eugadine Botanist, preserved his specimens, even *Melampyrum* not turning black: with his help, I managed to preserve a series of Eugadine plants, the colours of which were unusually good when I arrived in England.

The main secrets are first, not to use *much* pressure at first, and second, to be extremely careful not to keep the specimens in damp paper, even when drying.

Our plan was to take out a number of sheets of drying paper (Newman's Botanical Drying Paper, obtained at Gurney and Jackson's, late Van Voorst, 1, Paternoster Row, London) folded into "books," about three or four sheets to a book, one of these was carried in the hand, and as the specimens were gathered, if not too thick or fleshy, they were at once placed in the "book," no special care was taken about the arrangement of the parts of the specimens, except those of the flower or flowers, the rest of the specimen was contracted or folded together, so as to be contained inside the book: only one leaf was

left between each specimen, and the book was full, it was wrapped up in a handkerchief and placed in the pocket. A *good* day's collecting in this way would fill about four books. Larger and coarser specimens were placed in the botanical tin, sliced and thinned out at home and then placed between the paper, the specimens in the books were taken out at home, and by this time were sufficiently flacid to be easily arranged, whilst the petals were not too far gone to shrivel up as soon as taken out of the books; they were then placed between as many sheets of paper as could be spared, generally three or four; but this paper required changing every two days. If left in the damp paper the colours would "fly" very soon, and this changing of paper, especially when the specimens were numerous, was a very serious trouble, though well repaying in the end.

For home purposes, I have adopted the plan suggested by Mr. Flower, of Bath, which is extremely simple. The specimens are collected as already mentioned, which when placed on the drying paper at home, I put *at least* half-a-quire of paper between each layer, and then place a flat stone, cut to the proper size (about 17 lbs. weight) on the top of the pile so formed. The next time I bring home specimens, the fresh ones are arranged as before, and this pile placed on the first stone; a second stone being placed on the top, so that the lowest pile has double pressure. The same process is repeated the third day, and so on. The large amount of paper between each layer of specimens obviates the necessity of changing the paper, so that the pile (or piles) of specimens may be left for any length of time—six months if necessary—and can be taken out when convenient. The colours are almost invariably well preserved, because the pressure has been *slight* at first, and only when the juices have become what I may call "fixed," has the pressure been increased, and by that time almost *any* amount of pressure may be applied.

It will be readily understood that in certain cases, the pressure *may* thus be increased too rapidly, but it *need* not be so, if the collector remembers that less pressure is necessary at the time, but these cases will be very few. All I can say is, that after nearly 30 years experience, I have found the above plans simple, effectual, and very satisfactory. I would strongly urge *not* using screws, as the pressure cannot be properly regulated, and it is almost always the case that too much pressure is put on the specimens before they are ready for it.

In the case of those plants brought home in the tin, I consider thinning very necessary, if they are too thick, but this must be done with judgment, and the ends of the severed branches be left on the stem, to show that something has been removed. For thick plants, as the mullein or broom-rape, if

the specimen be split longitudinally into two, a double supply of specimens is secured. Fleshy plants, as stonecrop, heaths, pines and bulbs, must be placed in *boiling* water for a few seconds and then removed, to prevent anything more than the actual killing of the specimens.

When plants are brought home in the tin and placed between the paper for the first time, the paper must be changed after 24 hours, and then placed between a second supply, where they remain as long as convenient. It is always desirable to take the plants out of the tin as soon as possible, for though they will keep fresh for some days in the tin, the absence of light will affect the colour, and some specimens not unfrequently grow and are thereby really spoiled. Great care should be taken not to have the specimens in the tin in a wet state, or they will soon rot. Water plants, as a rule, dry up very rapidly in the air and it is always advisable to place them at once between paper.

It is by no means a bad plan to insert in the pile of drying specimens (especially if some are thick and others delicate) "boards" here and there, to separate the thick from the delicate, or those from one locality from others obtained elsewhere (though the *label* mentioned should always accompany each specimen), as they allow access to air and thereby also aid the drying. These "boards" are made of thin strips of wood, fastened crosswise, forming a frame the size of the papers.

It may be objected that the above plan involves a large amount of paper, &c., and is costly. This need not be the case. Drying paper practically never wears out, and the stock can always be added to, as funds allow. The folded newspapers are a great addition and are quite sufficient for grasses and sedges, and they can help out the proper drying papers, at all events for the first few years. The stones can be procured at any mason's and are inexpensive, one or two can be purchased at a time, or even bricks serve very well till means allow of proper stones being purchased.

To those whose time is valuable and who have (as I have had) to dry many hundreds of specimens every year, the plan I have pointed out is most convenient, the whole *arrangement* of the specimens being left till winter.

The poisoning of specimens, though partly effectual, is by no means universally so, and I have seen collections, though well poisoned, still liable to the attacks of moths. Besides, the mere damping of the specimen necessary for poisoning is certain to destroy the colour. The best safeguard against moths in my experience is the *using* of the specimen, taking them out of the cabinet for reference or show, and then disturbing any creatures that may have crept in. A lump of camphor kept in the cabinet will be very useful, provided no insects have previously attacked the specimens. Of course,

should a rare specimen be attacked, it is well worth poisoning it even at the cost of the colour, rather than have it utterly destroyed.

For fastening down the specimens, strips of gummed paper are all very well, but by no means safe, as the specimens are always liable to come unfastened. The plan adopted at the National Herbarium at Kew, and elsewhere, is to fasten the specimens down *entirely* with a mixture of equal parts of gum-arabic and thin tragacanth. But as my remarks have already been unduly lengthened, I will merely say that I shall be happy to explain the process, on application by letter.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

Anniversary Meeting, January 19, 1887.—ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

An Abstract of the Treasurer's Accounts was read by Mr. Stainton, one of the Auditors; and the Secretary read the Report of the Council.

The following gentleman were elected as Officers and Council for 1887:—*President*, Dr. David Sharp, F.Z.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Messrs. Robert M'Lachlan, F.R.S.; Gervase Mathew, R.N., F.L.S.; George T. Porritt, F.L.S.; Edward B. Poulton, M.A., F.G.S.; Osbert Salvin, M.A., F.R.S.; Henry T. Stainton, F.R.S.; Samuel Stevens, F.L.S.; and J. Jenner Weir, F.L.S., F.Z.S.

The retiring President delivered an address, and a vote of thanks to him was moved by Mr. E. B. Poulton, and seconded by Prof. Meldola.

A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. M'Lachlan and seconded by Mr. Stainton; and Mr. Goss and Mr. Grut replied.

A vote of thanks to the Council was proposed by Mr. Waterhouse, and seconded by Mr. White.—H. Goss, *Hon. Sec.*

HAGGERSTON ENTOMOLOGICAL SOCIETY.

Thursday December 23, 1886.—Mr. COOK, President, in the chair. Owing to the meeting being so near Christmas there was a very poor attendance of members.

Mr. Hockett exhibited the following reputed species: *E. grammica*, *N.*

bicolora, *N. tritophus*, *G. crenata*. Mr. Gurney, a long series of *H. defoliaria* from Epping Forest, shewing some nice forms, also *H. aurantiaria*.

Proposed by Mr. Phypas and seconded by Mr. Cook, that Mr. J. P. Much, become a member of the Society. Mr. Blofeld was balloted for and elected a member.

Thursday December 30, 1886.—Mr. J. A. Clark, Treasurer, in the chair. There was a very fair attendance of members, notwithstanding it being near the end of the year. Mr. Hanes exhibited *T. fimbria*, having the discoidal and reniform spots on one side confluent. Mr. Clark, a very fine series of *H. defoliaria*, being a selection from those taken at the excursion to Epping Forest on December 12th.

Thursday, January 6, 1887.—In the absence of both President and Vice-President, Mr. Pearson was elected to fill the chair for the evening. Mr. Cripps exhibited a long series of *Plagioderma armoraciæ*, a rather scarce species taken only in one locality in Surrey. Mr. May, some very curious forms of flints from the neighbourhood of Gravesend containing perfect specimens of *Echinus*. Mr. J. A. Clark, a very fine series of *L. polycommata*, some very nice varieties; also specimens of *A. promutata* and *A. degeneraria*. Mr. Lewcock brought on the discussion on *Thecla pruni*. The ova are laid in July, on the stems of blackthorn, and hatch in the spring, it is light-green when young, and when full-fed has yellow lateral stripes. It appears to be a very local species, and he had only taken it in Monk's Wood in Huntingdonshire, he found the habits of the species to be flying round blackthorn bushes, had only taken 12 specimens at the before mentioned locality, and thought that in the course of time *T. pruni* would be a scarce species. Mr. Harper stated that he was very much interested in the account given by Mr. Lewcock, he had never taken the species, being so very local, but had bred some from pupæ received from a correspondent. Mr. J. A. Clark presented the Society's Cabinet with one *A. degeneraria* and two *A. promutata*, one being very dark and the other a light specimen.

Thursday, January 13, 1887.—Mr. Hockett, Vice-President, in the chair. Mr. Russell exhibited a long bred series of *Thecla betulæ* and a pupæ case on a twig. Mr. Gurney, also a long series of *T. betulæ* one being rather large. Mr. Frankland stated that he had bred a specimen of *O. pudibunda*. Several species were presented to the Society's Cabinet and the remainder for distribution amongst the members. In the absence of Mr. J. A. Clark, the discussion on the Life History of *T. betulæ* was adjourned until the following meeting. Mr. Hockett proposed that on account of the number of surplus insects on hand that Thursday evening, February 10th, be appointed for the purpose of a general distribution.

Thursday, January 20, 1887.—Mr. Hockett, Vice-President, in the chair. There was a very good attendance of members. About 300 specimens were given by various members to the Cabinet and for distribution. Mr. Hawes exhibited a long series of *M. fuciformis* from the New Forest. Mr. Pearson exhibited a long series of *T. betulæ*, also pupæ cases. Mr. Harper a very nice series of *H. paniscus* and *H. actæon*. The discussion on the Life History of *T. betulæ* was introduced by Mr. Hockett, in the continued absence of Mr. J. A. Clark, who undertook to open the discussion. This species he had met with in the old locality (Epping Forest), the ova are laid in the Autumn on blackthorn, when young the larvæ are pale green with lines, the best time to procure the larvæ is the latter portion of June, he had taken it on the wing in August, but had not met with it anywhere else but Epping Forest. Mr. Pearson entirely agreed with the description given by Mr. Hockett, he had not seen this species on the wing, and thought that the principal locality was certainly Epping Forest, the best way to feed them was to put a few sprigs of the food-plant in a bottle and place the larvæ on, he found that they were very difficult to see when once on the food, and drew the attention of the members to the very perfect specimen of a pupæ case exhibited by Mr. Russell. The imago he found if left in the cage very soon got damaged. Mr. Anderson had not bred this species, but had observed it on the wing flying in a very wild fashion and settling on thistles and thought that it was a swifter flyer than *Z. quercus*. Mr. Gurney had a very limited knowledge of this species, he had bred them from larvæ taken at Epping Forest, and once caught a specimen at Chattenden. Mr. Harper remarked that years ago, he had beaten as many as fourteen dozen larvæ in one day, and that the scrubby portions always produced the most, the end of June is certainly the best time to take them. He had taken the imago at Darenth, but it seemed to have disappeared from there, and was very sorry to say that they were getting scarce in the Forest. Mr. Pearson thought that Mr. Harper's remarks were quite correct as to the gradual disappearance of this species, but thought that as the authorities were clearing the forest of some of its dense growth, it might in time become common again.—J. RUSSELL, *Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

January 13th, 1887.—R. ADKIN, Esq., F.E.S., President, in the chair. Mr. R. Frere was elected a member.

Mr. Adye exhibited *Dasycampa rubiginea*, and *Acherontia atropos*, both taken at Christchurch, 1885; *Cossus ligniperda*, and *Boarmia roboraria*, from the New Forest, and *Saturnia pavonia*, from Bournemouth. Mr. J. A.

Clark, varieties of *Hybernia defoliaria*, taken during the first week in December; also a male specimen of *H. aurantiaria*, in cop. with a female of *H. defoliaria*, from which he stated he had obtained ova. Mr. E. Joy a variety of *Lycæna corydon*. Mr. Goldthwaite *H. aurantiaria* and *H. defoliaria*. Dr. Rendall, *Procris globulariæ*, *statices*, and *geryon*, from Lewis; *Agrotis cursoria* and *S. undulata* and called attention to the tufts in the inner margin of the hind-wings of the last mentioned species. Mr. T. R. Billups exhibited some interesting specimens of Coleoptera; *Brachycerus imperialis* L., and contributed notes. Mr. T. D. A. Cockerell specimens of *Helix aspersa*, var. *lutesceus* and *Helix hortensis*, var. *rufozonata*, which he stated had been found living together on a bank at Torquay, by Mr. F. W. Wotton, of Cardiff. He also showed the type of *H. hortensis* from Teignmouth.

The President then read his Annual Address.—H. W. BARKER, Hon. Secretary.

CLYDESDALE NATURALISTS' SOCIETY.

The usual monthly meeting of this Society was held on Wednesday evening, 19th January, in the Society's rooms, 207, Bath Street—Mr. T. J. Henderson President, in the chair. Mr. Robert Dunlop exhibited a number of interesting geological specimens, several of which are new to Britain, collected at Calderbank, Airdrie, and made some instructive remarks regarding the various species exhibited. Mr. Robert Mason, F.L.S., showed a large number of slides containing finely-mounted specimens of foraminifera and entomostraca, mostly from dredgings in the Frith of Clyde. The exhibitor gave a very interesting account of these minute objects, tracing their history from their earliest appearance in the geological strata up to the present day, and also touched upon the subject of their distribution and peculiarities, as well as other points of general interest. Mr. Robert Mathieson a number of cases of beautiful foreign land and marine shells, principally from India, China, and the Red Sea; and also specimens of the pretty and curiously-shaped sponge popularly known as "Venus's Basket," regarding which he made some explanatory remarks. A very interesting discussion then followed, in which several of the members took part, and which elicited a good deal of information concerning the objects exhibited. Mr. T. J. Henderson showed two handsome cases of Indian butterflies, and explained the distribution of the various insects. The collection was much admired because of the brilliant colours and markings of some of the species. After some further discussion the meeting separated.

NOTES AND OBSERVATIONS.

THE BEE'S STING A USEFUL TOOL.—From lengthened observations, Mr. W. F. Clarke, a Canadian, has come to the conclusion that the most important function of the bee's sting is not stinging, but its use by that wonderful creature as a tool. Mr. Clarke says he is convinced that the important office of the bee's sting is that which is performed in doing the artistic cell work, capping the comb, and infusing the formic acid, by means of which honey receives its keeping qualities. The sting is really a skilfully contrived little trowel, with which the bee finishes off and caps the cells when they are filled brimful of honey. This explains why honey extracted before it is capped over does not keep well. The formic acid has not been injected into it. This is done in the very act of putting the last touches on the cell work. As the little pliant trowel is worked to and fro with such dexterity, the darts, of which there are two, pierce the plastic cell surface, and leave the nectar beneath its tiny drops of the fluid which makes it keep well. This is the "art preservative" of honey. Herein we see, says Mr. Clarke, that the sting and the poison-bag, with which so many of us would like to dispense, are essential to the storage of the luscious product, and that without them the beautiful comb-honey of commerce would be a thing unknown. This is certainly a most wonderful provision of nature.—From *Iron*.

CRYPTORHYNCUS LAPATHI.—During last summer, I noticed in one of my rambles, a sallow bust that looked very sickly. On examination it proved to be infested with the larvæ of a beetle. I left it until last month, when I went and cut it down, it having died in the meantime, and brought it home, on cutting it up I found it to be infested with *Cryptorhynchus lapathi* in the perfect state. It had undergone all its changes and lay dormant in its burrows, from which I conclude it must pass from the larval state to the perfect insect during the autumn months, and then lie dormant all the winter, making its escape in the spring. I noticed in the thin branches the burrows which extended from two to three inches in length were made straight up the branch, but in the thicker branches, after going straight up for about an inch and a half doubled back again a short distance from the other, so that they usually finished near to its commencement, the burrows were not made into the centre of the thick branches, but were made in the wood with a thin space from the bark. Another thing I noticed, they had not made any preparation for escaping the same as *Rhagium bifasciatum* does, the latter makes its burrow wider at the end, and leaves a very thin portion of wood, so that it has not much difficulty in making its escape, whereas *C. lapathi* lie and seem as though they had not made any preparation whatever. I got about

60 specimens of a beautiful colour (and could have got as many more had I been inclined), and put them into a bottle with a piece of rag in it, and brought them into the house, after being in a warm room for a little time they began to revive, and to make a faint squeak, which by putting your ear to the mouth of the bottle you could hear quite distinctly, I took several out and placed them in my warm hand, and as they began to revive you could hear them make the squeak, the squeak was similar to that made by *C. rostratus*, but, of course, not so loud. Have any of the readers of the *Young Naturalist* ever noticed this before? if so, they might give us their experience.—JOHN HILL, Little Eaton, Derby.

NOTES ON LEPIDOPTERA.

By B. LOCKYER.

(Continued from page 23.)

DIPTERYGIA PINASTRI.—At sugar and on palings in June and July. Rare about Hampstead Heath, Bishop's Wood, Highgate and Denny Woods, New Forest.

HELIOPHOBUS POPULARIS.—At light only. Settles on palings under gas lamps, where the herbage is rank. Rare about North London. August and September.

CERIGO CYTHEREA.—At sugar and light, in and near woods and heaths about Lyndhurst. Not very common; never took more than a dozen in one season. July and August.

LUPERINA TESTACEA.—On flowers of rumex. One only at the end of August, 1874, at Camden Town, in a field of rank herbage.

MAMESTRA BRASSICÆ.—On palings at sugar, light, and by mothing. Gardens, fields, woods, and waste places, all about North London. June to August.

M. PERSICARÆ.—At sugar, light, and garden flowers, in fields, waste places, and gardens (where the larva eats even gooseberry, currant, and tobacco plant), about North London. Frequently most abundant in June and July.

A. BASILINEA.—At light, end of May. Camden Town. One only.

A. OPHIOGRAMMA.—At flowers of cultivated plants, by mothing round ivy, and at light, in and near London. Three specimens only, the last on 28th July, 1878, at Highgate. Always on the wing about end of July.

- Denotata, Hb. Ante 1827. Berce. Stainton.
Campanulata, H.S. 1850. Doubleday. Staudinger.
 Innotata, Hufn.
Egenaria, H.S. ? or var. of *Helveticaria* (only one specimen.)
 Indigata, Hub.
 Constrictata, Gn.
 Nanata, Hub.
 Subnotata, Hub.
 Vulgata, Haw.
 Albipunctata, Haw.
 v. *Angelicata*, Crewe. (Dark, unicolorous.)
 Expallidata, Gn.
Pernotata, Gn.
 Absynthiata, L.
 Minutata, Hub.
 Knautiata, Gregson.
 Assimilata, Dbl.
 Subciliata, Dbl.
 Tenuiata, Hub.
 Lariciata, Filey.
 Dodoneata, Gn.
 Abbreviata, Steph.
 Exiguata, Hub.
 Sobrinata, Hub.
 Togata, Hub.
 Pumilata, Hub.
 Coronata, Hub.
 Rectangulata, L.
 v. *Nigrosericeata*, Haw. (Black)
 Debiliata, Hub.

COLLIX,

Sparsata, Hub.

LOBOPHORA,

Sexalata, Hub.

Hexapterata, W.V. 1776.

Halterata, Hufn. 1769.

Berce. Doubleday.
 Staudinger.

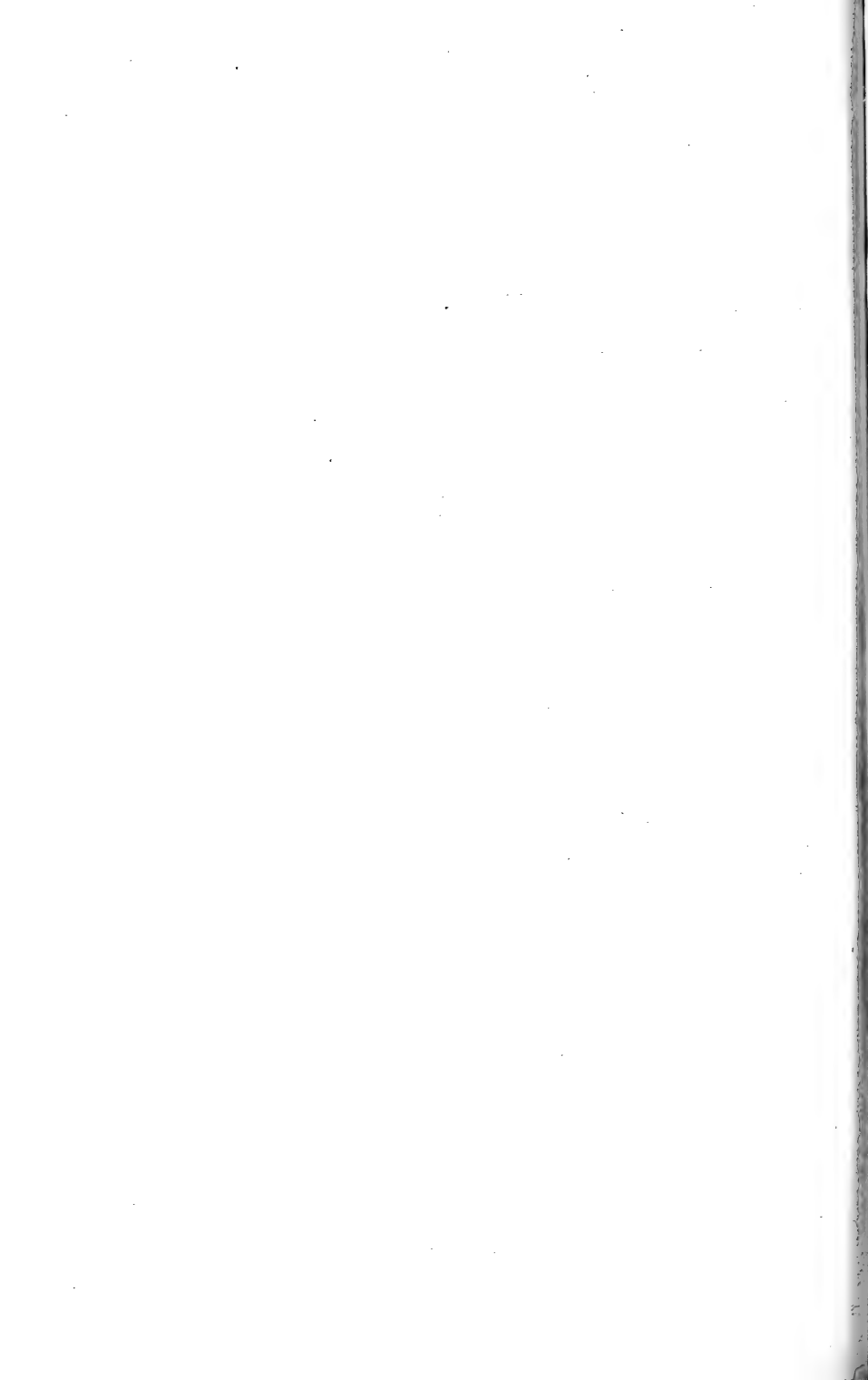
Viretata, Hub.

Lobulata, Hub. 1803.

Carpinata, Bork. 1794.

Berce. Doubleday.
 Staudinger.

Polycommata,



THERA, Steph.

Juniperata, L.

v. *Scotica*, White. (Darker.)

Simulata, Hub. Berce. Doubleday. Staudinger.

Coniferata, Curt. Stainton.

Variata, W.V.

v. *Obeliscata*, Hub. (The type is grey, this var. reddish-brown.)v. *Obliterata*, White. (Ground colour dark, obliterating the markings.)

Firmata, Hub.

YPSIPETES, Steph.

Ruberata, Frey.

Impluviata, W.V. 1776. Berce. Doubleday.

Trifasciata, Bhk. 1794. Staudinger.

Elutata, Albin. 1720. Berce. Doubleday.

Sordidata, Fab. 1794. Staudinger.v. *Fusco-undata*, Don. (Reddish-yellow, with black fascia.)v. *Infuscata*, Std. Cat. (Fuscous black.)

MELANTHIA, Dup.

Rubiginata, W.V. 1776. Berce. Doubleday.

Bicolorata, Hufn. 1767. Staudinger.v. *Plumbata*, Curt. (Ground colour grey.)

Ocellata, L.

Albicillata, L.

MELANIPPE, Dup.

Hastata, L.

v. *Hastulata*, Hub. (Smaller, but with larger black markings.)

Tristata, L.

Procollata, W.V.

Unangulata, Haw.

Sociata, Bork. 1794. Doubleday Sup. Staudinger.

Subtristata, Haw. Doubleday.*Birivata*, Hub. Stainton.

Rivata,

Montanata, W.V.

v. *Shetlandica*, Weir. (The central band broken.)

Galiata, W.V.

Fluctuata, L.

ANTICLEA, Steph.

Sinuata, W.V. 1776.

Cucullata, Hufn. 1767.

Rubidata, W.V.

Badiata, W.V.

Derivata, Albin. 1720.

Nigrofasciaria, Goze. 1779-81.

Berce. Doubleday.
Staudinger.

Berberata, W.V.

COREMIA, Gn.

Munitata, Hub.

Propugnata, W.V. 1776.

Designata, Hufn. 1767.

Berce. Doubleday.
Staudinger.

Ferrugata, L.

v. *Spadicearia*, Bkh. (Band of lines.)

Unidentaria, Haw.

Quadrifasciaria, L.

CAMPTOGRAMMA, Steph.

Bilineata, L.

v. *Testaceolata*, Std. Cat. (Brownish, rather than yellow.)

Fluviata, Hub.

Gemmaria, Hub. (The female has a black spot in a white ring, and was formerly described as a distinct species. Stainton II, 106.)

PHIBALAPTERYX, Steph.

Tersata, W.V.

Lapidata, Hub.

Lignata, Hub. 1799.

Villata, Bork. 1794.

Berce. Doubleday.
Staudinger.

Polygrammata, Bork,

v. *Conjunctaria*, Ld. (Central band less distinct or wanting.)

Vitalbata, W.V.

SCOTOSIA, Steph.

Dubitata, L.

v. *Cinerata*, Steph. (Smaller, paler, and without the reddish tinge of the type.)

Vetulata, W.V.

Rhamnata, W.V.

Certata, Hub.

Undulata, J.

CIDARIA, Tr.

Psittacata, W.V. 1776.

Siterata, Hufn. 1767.

Berce. Doubleday.
Staudinger.

Miata, L.

Picata, Hub.

Corylata, Thunb.

v. *Albo-crenata*, Curt. (Band entirely wanting.)

Sagittata, Fab.

Russata, W.V. 1776.

Berce. Doubleday.

Truncata, Hufn. 1767.

Staudinger.

v. *Centum-notatum*, Fab. (Central portion white.)

v. *Comma-notatum*, Haw. (Central portion orange-red.)

v. *Boreata*, Curt. (Brown, with distinct white lines.)

v. *Perfuscata*, Haw. (Smoky-brown.)

Immanata, Haw.

v. *Thingvallata*, Std. Cat. (White, with base and central fascia black or fuscous.)

v. *Marmorata*, Haw. (More marbled.)

v. *Unicolorata*, Std. Cat. (Nearly unicolorous, white, grey, fuscous or black.)

Suffumata, Hub.

v. *Piceata*, Steph. (The whole wing the colour of the band.)

v. *Porrittii*. (Wing white, except basal patch and central band.)

Reticulata, W.V.

Silaceata, Hub.

v. *Insulata*, Haw. (The type has the band unbroken, the var. has it divided into three portions.)

Prunata, L.

Testata, L.

Populata, L.

v. *Musauaria*, Fr. (Darker, nearly unicolorous.)

Fulvata, Forst.

Pyraliata, Albin, 1720.

Berce. Doubleday.

Dotata, Std. Cat.

South.

Dotata, L. 1758.

Berce. Doubleday.

Associata, Bkh. 1794.

Staudinger. South.

PELURGA, Hub.

Comitata, L.

Eubolidæ, Gn.

EUBOLIA, Dup.

Cervinata, W.V.

Mensuraria, W.V. 1776.

Berce. Doubleday.

Limitata, Scop. 1763.

Staudinger.



- Palumbaria, W.V. 1776. Berce. Doubleday.
Plumbaria, Fab. Staudinger.
 Bipunctaria, W.V.
 v. *Gachtaria*, Frr. (An obscurely marked form.)
 Lineolata, W.V. 1776. Berce. Doubleday.
Virgata, Rott. 1777. Staudinger.

CARSIA, Hub.

- *Paludata, Thunb. (The type is paler and less distinctly marked
 than the form occurring here.)

v. *Imbutata*, Hub.

ANAITIS, Dup.

Plagiata, L.

LITHOSTEGE, Hub.

- Griseata, W.V. Berce. Doubleday Sup. Staudinger.
Nivearia, Doub. Cat. non. W.V. Doubleday. Stainton.

CHESIAS, Tr.

Spartata, Fues.

- Obliquaria, W.V. 1776. Berce. Doubleday.
Rufata, Fab. 1775. Staudinger.

Sionidæ, Gn.

TANAGRA, Dup.

- Chærophyllata, L. 1767. Berce. Doubleday.
Atrata, L. 1758. Staudinger.

OMISSA ET ADDENDA.

Page 8, at bottom.

After *Arctia fuliginosa*, add

- v. *Fervida*, Std. Cat. (F.W. brighter brown. H.W. bright car-
 mine, with only a few spots of black.)

Page 9.

After *Mendica*, L., add

- v. *Rusticata*, Hub. (Male white or cream coloured. Female with
 fewer black spots.)

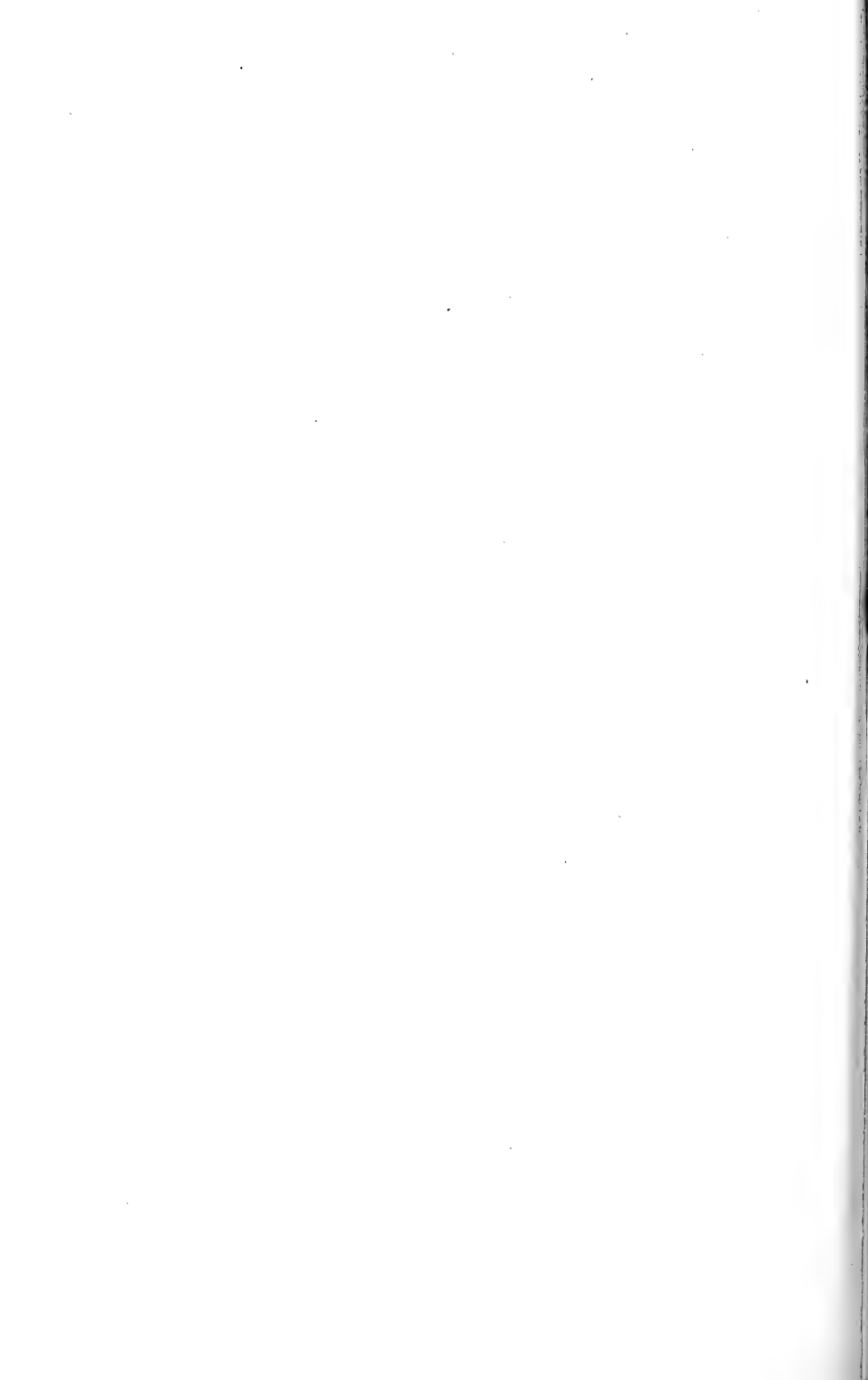
Page 10.

After LIMACODES, Lat., add

Asellus, W.V.

Page 20, at bottom, add

Populeti, Fab.



The YOUNG NATURALIST:

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PAPERS FOR BEGINNERS.

By ROBERT GILLO.

ON COLLECTING LEPIDOPTERA (APPARATUS REQUIRED, &c.)

THE following remarks are intended for the assistance of those young students only, who have recently commenced or are about to commence the collection and study of the Lepidoptera.

Our success in any undertaking depends to a great extent on the manner in which we set about it, more particularly will this be found to be the case, when our object is that of collecting insects, from the study of which we expect to derive a great deal of pleasure. Those who begin without the necessary appliances and materials find difficulties and disappointments almost at the outset, the result being that in many cases the study is abandoned. In this paper it will be my endeavour to point out what these essentials are, and how the necessary materials may be obtained at the least cost.

I have frequently met with those, who having procured a net rushed at once into the country, and caught a number of specimens without previously considering how they were to be set, or what they were afterwards to be kept in. Only last season I met two youths energetically collecting Lepidoptera. They succeeded in catching a number of specimens, some being rather good insects, but they had nothing to put them in except a very small wooden box, which was not lined with cork, and furnished only with a few common pins. Into this box they crammed all they caught, totally spoiling the whole of them. This is by no means an unusual occurrence, and seems to me to be nothing short of ignorant and wanton destruction.

For the collection of Lepidoptera a net is of course indispensable, I shall not describe this or express any opinion as to which form is best: the usual butterfly net known to every schoolboy answering very well.

The next desideratum is a killing bottle, which may be purchased cheaply. These bottles contain cyanide of potassium (a poison) covered with plaster of Paris, and if kept tightly corked will retain their deadly properties for a long time. For my own use, I prefer making a killing bottle by placing a small piece of sponge, moistened with common Benzoline, in the bottom of a wide mouthed bottle, and over it I put a piece of stout card perforated with small holes. This does not act quite so rapidly as the cyanide bottle, but if two benzoline bottles are used alternately no difficulty will be experienced on this score, and it has the advantage of being both simple and inexpensive. The plan of pinching the thorax of a butterfly or moth is at the best a bungling method and deforms and damages the insects.

The collector will also find it necessary to have with him a box in which to pin the specimens after they have been killed. This should be light and strong, made of wood, lined with cork, and so constructed that it will shut securely. The size may be about 7 inches long by 5 wide and $2\frac{1}{2}$ deep, or larger according to the number of insects the collector hopes to obtain on a single excursion. If it is made such a size as to slip conveniently into the pocket of a light overcoat it will be found more convenient. A supply of about three sizes of entomological pins is also required, and, if in addition to these, the collector takes with him a few strong pill boxes in which to place anything it is not desirable to pin in the box, he will be sure to find them very useful.

Many collectors, instead of killing their insects as obtained, prefer to take them home alive, and kill them at their leisure. If eggs of any species are desired, this course is absolutely necessary. For this, chip boxes are required, which may be bought "nested" from any chemist, at from 2/- to 2/6 per gross. "Nested" means that the sizes pack one within the other. In buying these do not get what are called "cut-down boxes," which are too flat, but the ordinary kind. For smaller insects, cardboard "pill" boxes are convenient, as they take up less room in the pocket. Some insects do not rest quietly in these boxes, but most do, and the collector will soon learn which he can safely "box." When captures are taken home in this way, it is well to have a larger receptacle for killing than the ordinary killing bottle, and a good-sized tin box, such as a pound mustard tin, or a larger one if you like, will do very well. At the bottom of this place a few pieces of cyanide of potassium, and either cover them with plaster as named above, or with a piece of cardboard the size of the inside of the box. When you want to use it open slightly the boxes containing your specimens, and place them in the larger box, leaving them there a longer or shorter time, according to the strength of your poison. The advantages of this plan are than you have not

to delay to kill and pin, which is sometimes an important matter when your game is on the wing. The advantages of the killing bottle are that you make sure at once that your specimen does not render itself unfit for preservation.

The above will be sufficient to begin with so far as the apparatus for collecting is concerned, but it is just as important to consider how the specimens are to be set, and in what receptacle they are to be afterwards kept. Some setting boards will be required, and must either be bought or made. As the boards and the various method of setting have been very fully and ably described in Vol. I. of this Journal, which is still in print, I will simply observe that it is folly to catch specimens until you have the boards on which to set them. You will always find friends glad to accept a well-set specimen, but no one will care for a badly set one, unless, indeed, it be a very rare insect, when perhaps it may be kept until a better one can be procured.

If you have neither the time nor the patience to set your specimens perfectly, or at least creditably, it is, in my opinion, a positive sin to collect them.

On the next occasion I hope to deal with boxes and cabinets.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 2nd, 1887.—Dr. D. SHARP, President, in the chair.

The President nominated Mr. Robert M'Lachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887-8.

The Rev. W. J. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford; Mr. C. J. Gahan, M.A. of Brompton, S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows.

Mr. P. Crowley exhibited a new species of *Pieris*—*P. Johnstoni*—from Kilima-njaro; also, for comparison, specimens of *Pieris mesentina* and *P. heltica*, which the new species closely resembled.

Mr. W. White exhibited a number of preserved larvæ of European Lepidoptera in various stages of growth,—including nine examples each of *Saturnia carpini* and *Deilephila euphorbiæ*,—illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his "Studies in the Theory of Descent."

Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna telicanus*, from the neighbourhood of Gallipoli, Turkey: also some specimens of a *Lycæna* from Vigo, believed to be varieties of *Lycæna baton*, but differing from the type in being much larger and darker. He further exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. æstiva* (Staud.)

Mr. Porritt exhibited, on behalf of Mr. N. F. Dobrèe, a series of a remarkable red form of *Teniacampa gracilis*, bred last season from larvæ collected in Hampshire.

Mr. Eland Shaw exhibited specimens of *Pachytylus cinerascens* (Fab.), *Mecostethus grossus* (Linnè) *Gryllus flavipes* (Gmel.), and read a "Note on the Identity *Gryllus* (*Locusta*) *flavipes*, Gmel."

The Secretary read a communication from Prof. Riley, of Washington on the subject of the "Australian Bug" (*Icerya purchasi*.) It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous; but on this point further evidence was asked for.

The Rev. T. A. Marshall communicated "A Monograph of the British Braconidæ," Part 2, being a continuation from Part 1 of the "Transactions" for 1885.

Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*."

Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure of the diminution of the rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals.

Mr. Frederic Merrifield read a paper (by way of an appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton."

Mr. M'Lachlan said he considered the fact that *S. illustraria* was dimorphic, an objection to its selection for the experiments proposed by Mr. Galton, and he suggested that the Common Silkworm Moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes.

Prof. Meldola called Mr. Merrifield's attention to some observations on *Selenia illustraria* by Dr. Knaggs in vol. iii. of the Ent. Mo. Mag., which had some bearing on the projected experiments; and he remarked that

although, for some reasons, the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results.

The discussion was continued by Dr. Sharp, Messrs. Baly, Kirby, White, Klein, Porritt, Dunning, Waterhouse, Bates, Merrifield, Galton and others.—H. Goss, *Hon. Secretary*.

HAGGERSTON ENTOMOLOGICAL SOCIETY.

January 27th, 1887.—In the absence of the President, Mr. Lewcock was elected to fill the office for the evening. Mr. Hanes presented the Society's cabinet with 150 specimens of Lepidoptera in very fine condition. Mr. Cripps exhibited *Harpalus latus*, *Pterosticus vernalis*, *Mezium affine*. Mr. Clark, preserved larvæ including *E. absynthiata*, *E. knautiata*, *C. prunata*, *B. roboraria*, *M. albicilata*, *E. blandina*, *B. castrensis*, &c. Mr. Lusby, a bright blue variety of female *L. alexis*. Mr. Hanes, *H. pennaria* and *T. derasa*.

February 3rd.—Mr. Anderson in the chair. There was a very fair attendance of members. Mr. Hanes exhibited *E. fuscantaria*. Mr. Harper, a very fine specimen of *A. paphia* var. *valezina*, *A. urticae* without spots, and *A. mendica*, an intermediate form between the male and female, and *S. philanthiformis*. A discussion ensued on the variety *rustica* of *A. mendica* exhibited by Mr. Harper, Mr. Anderson read the notice in the "Young Naturalist" by Mrs. Hutchinson, and the specimen exhibited was fully recognised as the one in question. Mr. Pearson introduced the discussion on *P. dispar*, he had not the pleasure of personal experience of this species, and stated that in Newman's "British Moths" the last date given is 1847-8, he mentioned that the var. *Rutilus* is found on the Continent, from May to August, and is the one that was usually regarded as the nearest approach to the British form. Yaxley and Whittlesea Mere appear to be the localities where they were taken, and there is no doubt but that it is now extinct. A few notes taken from books, relating to food-plants and habits, were given. Mr. Harper stated that within the recollection of his late father, the labourers had brought this species up to London to sell; he had seen a large number belonging to Mr. Standish, and pictures made of Lepidoptera, containing rings of *P. dispar*.

It was agreed that a cordial vote of thanks be given to Mr. Robson, for the list of Macro Lepidoptera now finished, and dedicating the same to this Society, it supplying a want that had been long felt.

February 10th. Mr Cook, President, in the chair. The death was recorded of Mr. Burry, one of the oldest members of the Society. Mr. Clark

mentioned having bred *N. hispidaria* on Sunday and Monday previously, 6th and 7th inst. The evening was set apart for the distribution of surplus insects, there were about 1000 specimens, many rare.

February 17th. Mr. Pearson in the chair. Mr. Lusby exhibited a very fine box containing varieties of *L. alexis* females. Mr. Pearson, specimens of *Leucanus cervus*. Mr. Clark, specimens of *Biundularia*. Mr. Gurney mentioned having bred *N. hispidaria*, and Mr. Clark had seen a specimen of *P. pilosaria* taken in Victoria Park.—J. RUSSELL, Secretary.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

January 27th.—R. South, Esq., F.E.S., Vice-President, in the chair. Messrs. F. Barclay and C. Roberts were elected members. Mr. J. Jenner Weir exhibited *Nilasera pirama*, Moore, and *N. amantes*; also a piece of amber containing three specimens of *Chrysomelidæ*, one of *Coccinilidæ*, and a species of *Orthoptera*. Mr. Billups living specimens of *Rhagium bifasciatum*, Fab., from Braemar, and contributed notes. Mr. J. J. Weir communicated a paper "Notes on the comparative rarity of Lepidoptera, *Rhopalocera*, once common in the neighbourhood of Lewes." In the course of the paper Mr. Weir said that *Aporia crataegi* was very abundant at Keymer in the year 1838, the following year he saw but one, and although he visited the locality for 15 years afterwards he never saw the species there again; and it appeared from Mr. Jenner, of Lewes, that the insect was now extinct in the district. He was of opinion that in the earlier decades of the century, a flight of this insect visited Sussex from some part of the Continent, and that the climate had not been favourable to its permanent establishment, and that it had gradually become extinct. The species had almost entirely disappeared from the New Forest, where it was at one time very abundant. *Leucophasia sinapis*, which according to Mr. Jenner, was rare where formerly found, was a case of an indigenous insect becoming extinct in certain parts of Sussex, which from the weakness of its flight was not likely to have flown over from the Continent. *Melitæa artemis (aurinia)* he had never met with in Sussex, although at one time it was extremely abundant. *Vanessa c-album*, which was now extinct in Sussex, was at one time so common in the hop-gardens, that the peasants had a local name for the larva, viz. the "Silver Bug." After referring to several other species in detail, Mr. Weir said, in conclusion, that as to the cause of the progressive rarity of the species mentioned, he could not hazard a conjecture, but he felt tolerably certain that it had not been brought about by the Entomologists, although in some instances man might be the cause, by the cultivation of the soil and the eradication of the food-plant of

the species. At the close of the paper an interesting discussion took place. Mr. Tugwell said that some years ago he had taken *A. cratægi*, at Herne, a village near Herne Bay. Mr. Chaney stated that *A. cratægi* was at one time very abundant near Rochester, and in fact all over the Hundred of Hoo, but disappeared about the year 1871. *Leucophasia sinapis*, used also to be abundant in a wood the other side of Chatham, but after the year 1856 it gradually became scarcer and scarcer, and about 1858 or 1859 disappeared altogether. Mr. Carrington remarked that there was a general scarcity of butterflies all over the country, and this he attributed to the severe winter of 1858 or 1859. Messrs. Tutt, Frohawk, Sheldon, Rendall, and others, continued the discussion.

February 10th.—R. Adkin, Esq., F.E.S., President, in the chair. Messrs. H. Collings and L. F. Hill were elected members. Mr. Stevens exhibited a remarkable variety of *Vanessa atalanta*, and a suffused variety of *V. io*. Mr. R. Adkin, *Spilonata incarnatana*, Hub., bred from larvæ found in shoots of *Rosa rubiginosa*, in the heart of Surrey, 40 miles from the coast. Mr. C. A. Briggs, a large number of *Lycæna corydon*, including dwarfed forms, blue and brown forms of the female, varieties with the spots absent from the underside, or in excess of the usual number and running into streaks. Mr. R. South, species of British and Foreign *Lycenidæ*, and contributed notes, calling particular attention to a variety of *L. corydon* from Asia Minor, which as far as he could remember were similar to the varieties exhibited by Mr. Sabine, at the Society's meeting on 7th October, 1886, who had stated that he had seen *L. adonis (bellargus)* and *L. corydon* in copula. This Mr. South said was quite possible, and he was of opinion that this variety was hybrid between the two species referred to. Mr. Hall remarked that he had had an opportunity of examining Mr. Sabine's varieties, and thought they were very similar to the variety now exhibited. Mr. South added that if this was so it could be safely assumed that Mr. Sabine's specimens were the variety *polona* of *adonis (bellargus)*, and were undoubtedly hybrid between *corydon* and *adonis (bellargus)*. Mr. Tutt observed that he thought the specimen referred to was simply a local form of *corydon*. Mr. E. Joy exhibited lepidoptera from the New Forest. Mr. Kelsall exhibited a living specimen of the Black Rat (*Mus rattus*), and made some observations upon his exhibit. Mr. Cockerill exhibited two species of Mollusca—*Succinea pfeifferi*, Rossm., and *Cochlicopa lubrica*, Mill.—from Canada, and said the two species were also to be found abundantly about London and throughout Europe. Mr. Cooper mentioned that he had just received a specimen of the Peregrine Falcon (*Falco peregrinus*), shot at Brandon in Essex. Mr. J. T. Carrington contributed a paper "Hibernation and Estivation," which was followed by a discussion.—H. W. BARBER, Hon. Sec.

CLYDESDALE NATURALISTS' SOCIETY.

The usual monthly meeting of this society was held on Wednesday evening, 16th February, in the society's rooms, 207, Bath Street—Mr. T. J. Henderson, President, in the chair. The chairman made reference in touching terms to the loss the society had sustained by the death of Mr. James M'Grouther, who was one of the original founders of the society, and was recently elected a vice-president. Mr. M'Grouther was an enthusiastic entomologist; and it was mainly through his personal influence that the society met with so large a measure of success. Mr. Robert Dunlop exhibited some very interesting geological specimens, including entomostraca from the carboniferous formation, and a well preserved specimen of a scorpion (*Glyptoscopus minutisculptus*) from the coal measures of Airdrie. An interesting letter from Mr. B. W. Peach, of the Geological Survey of Scotland, was read in connection with the specimen exhibited, which, along with Mr. Dunlop's comprehensive remarks on the subject, proved very interesting. Mr. Robert Mason, F.L.S., exhibited a beautiful specimen of the delicate and fragile sponge known as "Venus' Flower Basket" (*Euplectella aspergillum*), from the Philippine Islands; and also a number of microscopic slides, showing fossil spicules, regarding which he made some interesting remarks. Mr. Jas. Lumsden, F.Z.S., of Arden, exhibited a specimen of the Water Shrew (*Crossopus fodiens*, Pallus), which was found dead on a footpath, near Cardross, on 26th September, 1886. It had evidently been killed by an owl, or some other bird, as there was a mark on its head which showed that it had not died a natural death. Although not so nearly so common as the common shrew, the water shrew is widely but locally distributed on all parts of Scotland. The late Dr. Scouler, of Glasgow, was the first to add this species to the Scottish fauna, the specimen first taken by him having been captured near Glasgow. The species it is believed, has not before been recorded from any part of the county of Dumbarton. It was intimated that at next meeting Mr. D. M'Lellan, superintendent of parks, Glasgow, would read an important and interesting paper, entitled "Meteorological Notes and Remarks upon the Weather during the year 1886, with its general effects upon vegetation." Several new members having been proposed, a vote of thanks to the various exhibitors brought a most interesting meeting to a close.—JOHN MACKAY, Hon. Sec.

FIRST ANNUAL SUPPER OF THE CLYDESDALE NATURALISTS' SOCIETY.—The first annual supper of the above Society was held on Friday evening, 4th February, in the Royal Restaurant, West Nile Street, Glasgow. Mr. T. J. Henderson, President, in the chair. In the absence of Mr. McGrouther,

Major Bennett discharged the duties of Croupier. A hearty supper was partaken of, mingled not a little with good natured jocular remarks, and perhaps washed down with something that would have made Sir Wilfred Lawson look aghast. The chairman opened the proceedings by proposing in loyal and appropriate terms the toast of the "Queen and Royal Family" after which "God save the Queen" was lustily sung. As no member of the Royal Family had found it convenient to attend to respond, the toast of the "Army, Navy, and Volunteers" was proposed, and Major Bennett replied with a speech breathing defiance to Britain's enemies, not unmingled with the spirit of the song

"We don't want to fight, but by jingo if we do," etc.

The "Clydesdale Naturalists' Society" was next proposed by Mr. John Young, F.G.S., of the Hunterian Museum, who congratulated the members on the success which had attended their society, and the great future which he believed was before it. He also remarked upon the prolific nature of the Clydesdale district in all kinds of specimens. Mr. T. J. Henderson, in reply gave a brief sketch of the history of the society, and the work which it has accomplished. Mr. E. C. Eggleton proposed the toast of the "Kindred Associations," and J. B. Murdock, on behalf of the Geological Society, made a very appropriate speech in reply. "Our Corresponding Members" was the next toast, and Mr. Robert Dunlop, in asking the members to drink their good health, mentioned the valuable services which had been rendered us by our corresponding members in various parts of Britain. Mr. Robert Mason, F.L.S., on behalf of the corresponding members, none of whom were present, made a suitable reply. The toast of "The Ladies" was next proposed by Major Bennett, who seemed to be a warm admirer of the fair sex, judging his humorous and complimentary speech, which contained not a few beautiful metaphors, such as the "Ladies being the sunshine of our lives." Mr. John Mackay, being the youngest members present, replied for the ladies. He admitted, amidst much laughter, that he did not know much about the ladies, and expressed his conviction that it was because of his "extreme youth" that he was asked to reply to this toast, because older folks would be sure to have some grumble to make about the ladies. He believed that, like himself, they had some good qualities, but he was afraid that unlike himself they had some bad ones. Absolute perfection was very rare in this world, so rare that his friends often did not recognise it when they saw the embodiment of it. "The Committee" was proposed, and Mr. G. G. Mackenzie briefly replied. Mr. Robert Mason asked his friends to drink the health of "The Chairman," because they owed him much for which they should be grateful; he had occupied the position of chairman since the formation of the Society, and had contri-

buted very materially to its prosperity. The toast being enthusiastically drunk, Mr. Henderson suitably replied, and before resuming his seat proposed "The Croupier," who has done so much to help the Society in many ways, and Major Bennett acknowledged the honour in a few words. The health of Mr. John Young, F.G.S., was then proposed, and suitably acknowledged. Songs during the evening were contributed by several gentlemen including Messrs. John Young, C. B. Cross, Walker, etc. After spending a most enjoyable evening, the social gathering broke up at a somewhat late hour, by singing "Auld Lang Syne."—JOHN MACKAY, Secretary.

OBITUARY.

JAMES MCGROUTHER.

It is with the sincerest regret that I have to intimate the death of my friend Mr. James McGrouther, which took place on Friday, February 4th, at 61, Grant Street, Glasgow. Mr. McGrouther's name is so familiar to many readers of the "Young Naturalist," both as a contributor to the earlier numbers and as a personal correspondent, that it would not be out of place to give a short sketch of his entomological career.

He was born in Glasgow in 1864, and was therefore only in his 23rd year when he died. He was chiefly educated at private schools, and latterly at the Western Academy, Glasgow. In 1883, Mr. G. A. Henty, the *Standard's* War Correspondent in the Franco-Prussians war, formed the "Union Jack Field Club," for the study of natural history; and, I am sure, many of my readers will remember the good work performed by this club in stimulating so many young men, in all parts of Britain, to take an active interest in the study of natural history. Several branches of the U.J.F.C. were started in Glasgow, the most energetic of which was the Glasgow (Western) branch, of which, I believe, Mr. McGrouther was president, and it was while connected with this society that he first commenced the practical study of entomology. In the course of a year or two these clubs gradually disappeared, not, however, without having produced a number of real conscientious workers in entomology, whose love for the study was not a mere transient whim. In 1883 it occurred to me that, as these entomologists were working mostly by themselves, and had not often the pleasure of meeting a "brother of the net," it would be a wise plan if a society were formed where those individuals could meet once a month and exchange notes, exhibit specimens, and generally help one another in the study. I approached Mr. McGrouther on the subject, but he was somewhat doubtful about its chance of success. The subject was frequently spoken of, until at last in September of that year, the

first meeting of the "Glasgow Practical Naturalists' Society" was held in Kelvingrove Museum, under very encouraging circumstances. The society quickly sprung into energetic life, and prospered beyond all the expectations of its originators. Sometime later the name of the society was changed to the "Clydesdale Naturalists' Society." Mr. McGrouther's entomological pursuits have been so closely connected with the society that it is hardly possible to mention the one without implying the other. He was elected its first secretary, and undoubtedly, much of the success which attended its subsequent history was due to his personal energy and kindly disposition. Entomology was at first the chief subject of study among its members, but in a short time it embraced representatives of all the principal branches of science, including several eminent authorities on various subjects. Mr. McGrouther's health during the last two years was never very good, and latterly his love for the haunts of the local insect rarities had to be subordinated to a careful respect for his health. The delightful afternoons in summer which we spent at Cadder Wilderness, and other shady retreats, became of late less frequent, and latterly his entomological excursions into the country were at rare intervals. Last July he accompanied me on a week's holiday in Argyllshire, where he manifested his old love for the moors and woods, where insect life abound. Our holiday was an exceedingly pleasant one, and seemed to do him some good. Shortly after his return his mother died, and this loss so grieved him that it cannot be said that he ever recovered from it. A short time since it was proposed that the members of the Clydesdale Naturalists' Society should hold their first annual supper, and as one connected so intimately with its origin, Mr. McGrouther was to officiate as Croupier. A few days before the event came off, I received word that owing to an attack of liver complaint, he would be unable to attend. Nothing serious was thought of his illness, and he was believed to be quickly recovering his health. On Friday, however, a singular change took place; he was harrassed by a troublesome cough, and inflammation seemed to have taken hold of his lungs, and he became unconscious. About eleven o'clock at night, on the 8th February, he breathed his last. All that was mortal of him was laid in the grave, beside that of his excellent mother, in the Western Necropolis, Glasgow. Now that he is gone from earth, he will be missed by many, for his kindly disposition made him many friends. To those who knew him intimately, he will be ever a pleasing memory, and one not likely to be ever effaced. Indeed, his absence at our meetings and at our country rambles, will be a painful experience to his entomologist friends. He was a frequent correspondent with many of the readers of the "Young Naturalist" and the news of his sudden death will be a grief to many. Thus quickly are our

dearest friends taken from us. So suddenly, indeed, at times, that we cannot help thinking of the wisdom of the thought, so well expressed by Shelley, in his "Adonais"—

"Great and mean
Meet massed in death, who lends what life must borrow.
As long as skies are blue, and fields are green,
Evening must usher night, night urge the morrow,
Month follow month with woe, and year wake year to sorrow."

JOHN MACKAY.

Glasgow.

THE EDITOR'S CHAT WITH HIS YOUNG FRIENDS.

Ovæ or Ova.

There is no correction so often needed to be made in the manuscript that comes through my hands, as to alter *ovæ* into *ova*. Indeed, the error is so frequent, that my eyes become accustomed to the combination of the letters, and I find myself occasionally passing it as correct. Whether it is wise or not, that words from other languages, imported into our own, shall form their plural as they did in their original, is a matter about which we have no concern. It is the rule and we must conform to it. Young Naturalists are not necessarily Latin scholars, and they seem to think that because *larva* and *pupa* are singular, and *larvæ* and *pupæ* plural, that *ova* and *ovæ* must be correct also. Will they pardon me if I tread on delicate ground, and remind them that the Latin word for egg is *ovum*. Now there is one word in common use with the same termination, *memorandum*, and when the plural is needed no one thinks of writing anything but *memoranda*. Entomologists too, say *desiderata* always. The same mode of forming the plural then applies to *ovum*, and we need hardly say now that *ova* is correct, not *ovæ*.

Imago is another word often made plural by the English rule of adding *es*, and we see *imagoes* frequently written and occasionally printed. But the word is made plural by the Latin rule, not the English. Of course, these remarks are only intended for the ignorant few, not the enlightened many, and the latter class must not be offended and think they apply to them. But to those who did not know before, I say, remember then—

Singular	<i>Ovum.</i>	Plural	<i>Ova.</i>
,,	<i>Larva.</i>	,,	<i>Larvæ.</i>
,,	<i>Pupa.</i>	,,	<i>Pupæ.</i>
,,	<i>Imago.</i>	,,	<i>Imagines.</i>

“Spring-time is coming.”

In the first article in this part, Mr. Gillo strongly urges on beginners the importance of doing a little in the way of getting ready, before commencing to collect. No doubt it is very necessary for intending collectors to be prepared beforehand, and many never get any further than the first attempt, because they find they were not ready, their captures were all spoiled, and they had their trouble for nothing. But are there not many who have got further than a first attempt, who can boast of a respectable number of well-set specimens, who neglect most necessary preparation? Spring is close upon us. Already the early moths are gladdening the eyes of those who look for them. I had the pleasure last week of examining the first captures of our contributor Mr. John Henderson, and even here in the North we must be up and stirring. But are we ready? You and I, I mean. I know I have written all this before—more than once, perhaps—and perhaps it had its effect last year or whenever it was said. But are we all ready now. That net with the large hole in it! You remember how those moths shuffled through it the last time you were at ivy bloom? Is it mended yet? No! I thought not. What a pity it would have been had you gone off to the shallows without remembering it. Of course it would have been unintentional, but that would have made no better of it. Had you made your mind up just at train time, that as the evening was so fine, you would be off for your first collecting, and with little time to spare had got your apparatus together in a hurry, how you would have anathematized your procrastinating habits, and vowed never to be stupid again. Bless you, I know all about it. I have been at it this 30 years, and I don't always practise as I preach even yet. Do you? Only last March I had to stay at home one night because I was not ready, and I will never know what I lost that night. Of course I determined I would never be unprepared in future; but its lucky I have got on this subject, for I don't think I ever fastened the loose ferrule of my most useful net. But it is in my mind now, and I'll have it done to-morrow. Yes, that is it. Have it done to-morrow. Do *you* put off till to-morrow? I do sometimes, and I know the folly of it. I flatter myself, however, that I am not nearly so bad as I once was, and I therefore urge upon my younger readers, now when the season is just about to commence, to get all ready. Get your nets in order, see you have plenty of pins, look to your setting boards that they have no mites about them, examine your collecting boxes, chip and otherwise, and do what you can to get everything in order. Or, if you cannot get all ready, get as much ready as possible, and leave what is of least importance *if you can*.

NOTES ON LEPIDOPTERA.

By B. LOCKYER.

(Continued from page 40.)

A. OCULEA.—July and August. On palings at light and at sugar. Outskirts of woods, gardens, fields of rank herbage, lanes, &c. Used to be abundant about North London and in the New Forest. The larva feed *in* the unopened culms of meadow soft-grass, its presence being betrayed by a small black hole near the tip of the exterior sheath of the culm. It is rather large as compared with the size of the moth, thick-skinned, smooth and shiny, and with those of the genus *Miana*, which it resembles in shape (while differing from them in not being like them, small for the size of the imago), having the lively wriggling habit of a Tortrix larva. Requires a tight fitting cage.

MIANA STRIGILIS.—At sugar, in woods, fields, and gardens. June and July. There is a grass-green variety of the larva, which feeds in March and April exposed by night.

M. FURUNCULA.—On flowers of *Arctium* and *Rumex*, and at sugar. In great abundance. Also on palings, in rank pastures, gardens, and lanes, in August and September. Most extraordinary varieties (one corresponding to the var. *conversaria* of *Boarmia repandata*) may be obtained.

GRAMMESIA TRILINEA.—At sugar in June. No rarity. Bishop's Wood, Southwood, and New Forest. Var. *Bilinea* rare in Bishop's Wood.

ACOSMETIA CALIGINOSA —Flying by day amongst long grass in the broad "rides" of Park Hill enclosure, New Forest. July.

CARADRINA MORPHEUS.—Flying over rank herbage in a field at Camden Town, in June. I never saw it after 1868, when it was not rare.

C. ALSINES.—The larva rare at Highgate (Southwood) in April.

C. CUBICULARIS.—Not very common in the same locality as *C. morpheus*. At light, sugar, and by mothing. The larva on seeds of plantain in the autumn.

RUSINA TENEBROSA.—At sugar in June and July. Females much scarcer than males. Bishop's Wood, Southwood, and Denny Wood, New Forest. No rarity.

AGROTIS VALLIGERA.—Rare on Yarmouth Sandhills, August, 1879.

A. PUTA.—Rare at sugar, Hurst Hill enclosure, New Forest. August.

A. SUFFUSA.—At sugar and light in rank pastures and woods. August and September. Rare, Bishop's Wood, Camden Town, and Darenth Wood, New Forest.

A. SEGETUM.—Not very common in woods, rank pastures, and waste places about North London. June and July.

A. EXCLAMATIONIS.—At sugar, light, and kicked up by day, or by mothing, in woods, fields, waste places, and gardens. Very abundant all about North London; I have counted 70 on one tree.

A. CORTICEA.—Saw this common at sugar in Mr. Bernard Cooper's garden at Higham Hill, Walthamstow, August, 1874.

A. NIGRICANS.—On flowers of *Rumex* and *Arctium* in rank pastures. Not very common. Camden Town, North London. August.

A. PORPHYREA.—Rare, flying over heather, on heaths and in woods (Denny Wood, New Forest.) July.

TRIPHÆNA JANTHINA.—At sugar, light, and on flowers of *Arctium lappa*. July and August. There is a remarkable but by no means pretty variety (?) to be obtained by breeding, much smaller than captured specimens. Not very common. Fields, lanes, gardens, and woods about North London, and at Lyndhurst.

T. INTERJECTA.—At sugar. Rare. Woods in the New Forest. August.

T. SUBSEQUA.—At sugar. New Forest. Generally distributed and common in 1871. July and August. This insect looks much narrower on the sugar than *T. orbona*; it is also rather more variegated in appearance than ordinary *orbona*.

T. ORBONA and PRONUBA.—In addition to light and sugar I have taken these on flowers of *Arctium lappa* in a rank pasture.

T. FIMBRIA.—Abundant at sugar in the New Forest. July and August. The larva also abundant in the woods at Hampstead and Highgate, but between 1870 and 1875 I only heard of the capture of one perfect insect, which I saw taken by Mr. V. B. Lewes, in Bishop's Wood, at sugar.

NOCTUA GLAREOSA.—Saw specimens in the possession of Mr. G. Tate taken at sugar, in Park Ground enclosure, New Forest, in September.

N. PLECTA.—Rare. At rest on sugar and bred. Camden Town, Muswell Hill (Middlesex), and New Forest. May and August.

N. AUGUR.—Two single specimens at sugar, beginning of July. Woods and lanes near, the second specimen in a garden, probably escaped from my breeding cage. The larva common on hawthorn, oak, and sloe (rather gregarious), in April and May, about Highgate. More liable to emerge slightly deformed than any other insect of this genus, except *N. xanthographa*.

N. C-NIGRUM.—Rare according to my experience. At rest on window-cill and at sugar. Camden Town, Bishop's Wood, Park Ground Inclosure, New

Forest, and Southend, Essex. June and August. Woods, waste places, rank pastures, and gardens near. Took one larva which fed on burdock and dock, ceasing from October to February, and full-fed early in May. Taken under a leaf of *Arctium lappa* in September, and then green; but grey (only tinted with green beneath) when full-fed; mottled with ochreous; oblong black spots on sub-dorsal line as in *Xanthographa*, from 5 to 12 segments; and a broad white band, black-edged above, along the spiracular region; the spiracles orange. This is a longer, flatter, and more opaque larva than *Xanthographa*, its head is marked as in that larva, but the darker mottlings on the body follow the pattern in *N. festiva*.

B. TRIANGULUM.—Not rare as a larva, but only one specimen at sugar in Denny Wood, New Forest, in July, 1873. The larva also at Highgate and Hampstead.

N. RHOMBOIDEA (?)—A species first captured by myself as far as I am aware, and of which over 100 specimens were captured at sugar in Hurst Hill Inclosure, New Forest, in August 1874, Mr. G. Tate, Mr. M. J. G. Ross, the Messrs. Parker, and myself. I exhibited and named it *Rhomboidea*, at two Societies in London. If this be correct, "deep slaty grey" would better convey the tint in words than "dark purple," the colour is most unvarying. I believe Mr. Ross still has a series.

N. BRUNNEA.—At sugar, beginning of July, in woods. Highgate, Hampstead, and New Forest. Common.

N. FESTIVA.—At sugar and bramble bloom in June and July. Highgate, Hampstead, and New Forest. Abundant.

(To be continued.)

NOTES AND OBSERVATIONS.

MACROCENTRUS INFIRMUS BRED FROM HYDRÆCIA PETASITES.—The batch of cocoons, which looked like an oblong pellet of felt, which Mr. Pierce found in the stem of burdock, instead of his wished-for pupa of *Hydræcia petasitis*, produced in the autumn 122 males, and the one he so very kindly sent me in August 1885, contained 175 females of *Macrocentrus infirmus*, which emerged the following month. This is very curious that one should produce all males and the other all females, but I think I may say it is the rule with those of the same genus (*Macrocentrus*), that form batches, to produce only one sex, at least it has been my experience when I have bred *linearis*, *colearis*, and *infirmus*.—G. C. BIGNELL, F.E.S., Stonehouse, Plymouth.

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A YEAR'S SPIDER HUNTING.

By H. WALLIS KEW, F.E.S.

EARLY in 1886, having had a promise of assistance from the Rev. O. Pickard Cambridge, I commenced to collect spiders, for the purpose of drawing up a list of the species I obtained as a contribution towards the neglected fauna of the County of Lincoln, and with the view of obtaining a knowledge of this interesting order of animals. A list of the 68 species which were identified during the year, from the neighbourhood of Louth, has appeared at pp. 55—59 of the February issue of the current volume of the "Naturalist," to which the remarks in this paper may be considered as supplemental. The following are among the species taken during 1886, arranged according to the situation or mode of capture:—

UNDER BARK—*Harpactes hombergii*, *Segestria senoculata*, *Clubiona holosericea*, *Amaurobius fenestralis*, *Celotes atropos*, *Epeira umbratica*, *Epiblemum cingulatum*.

The flaking outer bark of sycamores, well known to entomologists as sheltering large numbers of insects, is hardly less productive in spiders, so far at least as the numbers of two species, *Harpactes hombergii* and *Amaurobius fenestralis*, are concerned. At all times of the year, the first named spider is abundant under the bark of some sycamores at the village of Hallington, near Louth; when the place was visited in January last, numerous specimens were seen, which when disturbed (the slender males especially) ran over the bark in an excited manner and appeared to be inconvenienced by the cold atmosphere. Small specimens of *Amaurobius fenestralis* were plentiful, adult examples less so. *Epiblemum cingulatum*, Panz.—one of the "jumping spiders"—(confused together with *E. scenicum*, Clk. by Mr. Blackwall under the name of *Salticus scenicus*) is plentiful in this district under the bark of wooden railings and posts, and in the summer is often to be found with its egg-cocoons.

UNDER STONES AND LOGS OF WOOD.—*Dysdera cambridgii*, *Drassus lapidicolens*, *Cryphaea silvicola*, *Cælotes atropos*, *Walckenaera acuminata*, *Trochosa terricola*. In September, 1886, two specimens of *Cælotes atropos* were found in crevices of wooden railings accompanied by their young. This spider is far from rare here.

RUNNING ON THE GROUND.—*Ocyale mirabilis*, *Pirata piraticus*—near water,—*Trochosa picta*, *Tarentula miniata* (Southport, Lancashire, and Mablethorpe, Lincolnshire, are as yet the only English localities for this spider), *Tarentula pulverulenta*, *Lycosa amentata*, *L. lugubris*, *L. proxima*, *L. nigriceps*. All the spiders enumerated under this head belong to the family Lycosides. They spin no snare, and the females carry their egg-cocoons about with them. A fine female specimen of *Ocyale mirabilis*, bearing its large yellowish cocoon along with it over the grass of some dry hill-side, is a sight likely to impress itself upon the memory.

ABOUT WALLS AND RAILINGS.—*Amaurobius fenestralis*, *A. ferox*, *Tegenaria derhamii*—("common house spider"), *Theridion varians*, *Steatoda bipunctata*, *Meta segmentata*, *Zilla x-notata*, *Epeira umbratica*, *Trochosa ruricola*, *Epiblemum scenicum*—("jumping spider.")

Searching walls with the aid of a lantern at night, as well as being a productive mode of slug-collecting, discovers numerous spiders. The males of *Amaurobius fenestralis* seem to be very fond of prowling over the surface of walls after dark. *Epeira umbratica* is pre-eminently a nocturnal spider, and lies concealed during the whole of the day, when collecting at night with a lantern, however, it is often found in the centre of its toil about walls, and still more frequently between the bars of wooden fences. In April last, when collecting after dark on Hubbard's Hills, a good number of young specimens were found in the centres of their large snares hung between rails, all within a space of about ten yards; and a few days afterwards I took three adult specimens which were concealed beneath the bark of the same fence within about the same distance. *Zilla x-notata* is often very plentiful between the upright bars of iron railings surrounding gardens, in whose company I have found the pretty little *Theridion varians*.

IN HOUSES.—*Drassus blackwallii*, *Amaurobius fenestralis*, *Tegenaria derhamii*, *Theridion denticulatum*, *Steatoda bipunctata*, *Zilla x-notata*, and *Attus pubescens*.

Amaurobius fenestralis is a common house spider here, although in the South of England it appears to be rarely found in buildings (see "Spiders of Dorset," p. 56.) *Theridion denticulatum*, *Steatoda bipunctata*, and *Zilla x-notata* spin their toils in the corners of neglected windows. *Tegenaria der-*

hamii is the common house spider of Europe, and its dingy snares are familiar objects in the corners of disused rooms and out-buildings.

SEARCHING AMONGST FOLIAGE.—A great number of spiders are to be found amongst foliage, but I only include here those spiders whose webs are most likely to attract the attention of ramblers in the country—*Agelena labyrinthica*, *Theridion sisyphium*, various species of the genus *Linyphia*, *Meta segmentata*, *Zilla atrica*, *Epeira diademata*, *E. scalaris*, *E. cornuta*, *E. quadrata*.

My favourite spiders are the tenants of the webs of radiating and spiral lines—those of the Family Epeirides, and especially those of the typical genus *Epeira*, which are among the largest, most handsome, and best known of all our British spiders. The adult females are truly beautiful creatures, and it would be difficult to say which of the above mentioned species is the most handsome—*diademata* with its white cruciform marking on a yellow-brown ground, *scalaris* with its yellow abdomen and rich brown band, or *quadrata* with its four large white spots on a very variable but always extremely beautiful ground colour. *Cornuta* is a beautiful species but is less gaily coloured than the three just mentioned. The familiar garden spider (*Epeira diademata*) is a generally distributed species, and is found in woods and hedge-rows, as well as in gardens. In no situation have I found it more abundantly than in the Louth Cemetery, where in early autumn hardly a shrub is free from its conspicuous webs. *Epeira quadrata* is more plentiful on the coast sand-hills at Mablethorpe, than in any other locality in this district; when I visited the place last October it was literally abundant, the specimens being adult, and of a rich amber colour, with a well developed quadrangle of whitish spots. This species generally constructs its snares amongst the strong grass or about the dewberry bushes, and it is but rarely to be found on the sea buckthorns which are so plentiful on our sea-banks. The nest made by this spider is dome-shaped and open at the bottom, and when the web is placed amongst grass it is very conspicuous.

On these sand-hills also large sheets of web leading downwards towards a funnel-shaped retreat, the work of the Labyrinth spider (*Agelena labyrinthica*), are stretched over the grass and low branches of the sea buckthorns, and must be familiar even to those not interested in natural history. Within the tube connected with these webs is to found a quantity of insect remains, including sometimes the wing-cases of beetles of considerable size.

The toil of *Theridion sisyphium* (*T. nervosum*, in Blackwall's "Spiders of Great Britain and Ireland") is of large size, and is composed of innumerable lines crossing and re-crossing each other in all directions. Furze bushes are the favourite dwelling places of this spider, and five or six, or often a much larger number, not unfrequently take up their abode in one bush,

so as to make its branches look like the framework of one immense web. About these webs and often in their midst, the very beautifully constructed nest is placed, and in it we find the female spider with her green egg-cocoon, or later on surrounded by her young. In the autumn, when the young have left the nest, they swarm upon furze bushes, and when beating they often fall into the net in very large numbers.

The horizontal webs of members of the genus *Linyphia* often cover shrubs and hedge-bank herbage to such an extent that it is impossible that they should escape observation.

Another abundant spider is *Zilla atrica*, which is very nearly allied to *Z. x-notata* mentioned above, the long palpi of the male of *Z. atrica*, however, at once distinguished it from *Z. x-notata*. I have never found *Z. atrica* more abundantly than on a hot day in last September when I was rambling in a wood, known as Raithby Brackens, where much of the ground is covered with furze bushes; these bushes were mantled with the orbicular snares of this *Zilla* (*Epeira calophylla*, of Blackwall), which were rendered the more conspicuous by the fact that a swarm of Aphides had recently passed over the place, immense numbers of which had been left entangled in the webs.

BEATING.—*Drassus lapidicolens*, *Clubiona holosericea*, *Dictyna uncinata*, *Theridion sisyphium*, *Theridion bimaculatum*, *Phyllonethis lineata*, *Neriene rubens*, various species of the genus *Linyphia*, *Ero thoracica*, *Meta segmentata*, *Zilla atrica*, *Epeira cucurbitina* and other members of the genus *Epeira*, *Xysticus cristatus*, *X. audax*, *X. lanio*, *X. ulmi*, *Oxyptila atomaria*, *O. praticola*, *Lycosa nigriceps*.

The best mode for capturing a large *Epeira*, and indeed most of the other spiders mentioned under the head of "Searching amongst Foliage," is to place the beating-net below the web, and then administer a sharp rap with the stick, which brings down the spider and leaves it sprawling in the net.

DRAGGING.—*Linyphia hortensis*, *L. montana*, *Phyllonethis lineata*, *Pachygnatha degeerii*, *Tetragnatha extensa*, *Xysticus cristatus*, *Philodromus aurcolus*, *Tibellus oblongus*.

Tetragnatha extensa if taken up in the fingers, like most other spiders, will bite, or rather endeavour to do so, with great energy, but it is quite unable to make any mark upon the skin. This menacing spirit exhibited by our larger spiders, probably accounts in a great measure, for the general prejudice which is entertained against them. I have not yet quite mastered my innate dislike for spiders, and although, should occasion require it, I have no objection to taking the larger Coleoptera or even a slimy five-inch

long *Limax* with the fingers, I should be very sorry if it were necessary to capture spiders, the stronger kinds especially, by that means.

The best modes of collecting and preserving spiders, are those recommended by Mr. Cambridge. The fact that an extract from the introduction to the "Spiders of Dorset" has been reprinted at pp. 38—41, Vol. VII of this Magazine, renders it unnecessary for me to make any remarks here under this head.

Louth, Lincolnshire.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

In the following paper I propose to give a brief account of those insects that are obnoxious or injurious to our household property, or to articles of commerce, those which inhabit our dwellings, and the various buildings, and vessels which are used in the pursuit of trade and commerce, as well as those feeding on wood and bark.

I begin with the Cockroaches, which most people erroneously call black beetles. They are perfectly distinct from the order COLEOPTERA or Beetles. The cockroaches are distinguished from beetles by the different character of their metamorphosis, by the structure of the wings, and other peculiarities. The head is vertical, and jaws transverse. The mouth consists of a labrum, two mandibles, two maxillæ, and four palpi. The body is ovate and depressed. Their fore-wings (or tegmina) are coriaceous, or resembling leather, veined, when at rest the inner margin of one wing folding over the inner margin of the other, and the portion covered is less deeply coloured than the rest of the wing. The hind-wings are folded longitudinally, except the anterior third which lies flat. The prothorax is large and shield-shaped, often completely concealing the head. The antennæ are very long, setaceous or resembling a bristle, and have from fifty to one hundred and fifty joints: The mandibles are short, strong, and horny, toothed at the tip and on the inner surface. The legs are long and compressed, well formed for running. The abdomen is furnished at the tip with two short, conical, compressed, articulated appendages, which exist in both sexes, besides which there is also in the males a pair of slender inarticulated appendages. These insects belong to the family BLATTIDÆ and to the order ORTHOPTERA. They are very numerous both in species and individuals, but are principally inhabitants of the tropics. About eleven species are on the British list, but very little is

known about many of them, as their obnoxious habits cause them to be regarded with antipathy. All the species cast their skins five or six times before they arrive at perfection when the old covering is thus thrown off they are quite white, but soon assume the darker colour.

Blatta orientalis is the commonest species. The males have short wings and tegmina, not covering more than two-thirds of the abdomen. The females have the tegmina still shorter, and the wings entirely obsolete. These insects are peculiarly interesting from their mode of carrying and depositing their ova, which is enclosed in a horny capsule or case, divided into two compartments, in each of which is a row of separate spaces, each containing an egg. The female may frequently be seen running about with the end of the capsule protruding from the end of the body, and she sometimes carries it a week or a fortnight before she finds a suitable place for its deposition. The capsule is about the size of a coffee berry and slightly resembles one. A friend of mine found a number of these capsules in the crevices near the kitchen fireplace, and concluded the cockroaches had been appropriating the coffee beans. This species is not considered an indigenous insect, but is believed to have been imported from the Levant. They are much too common now in our houses, where they live about the kitchen fireplaces, in restaurants, bakers' ovens, calender works and other places where they can enjoy warmth. They devour almost everything, bread, flour, meat, cheese, and even the contents of natural history collections; nothing comes amiss to them. They are nocturnal in their habits, hiding during the day.

Blatta germanica is also an introduced species. In Manchester where it is found in restaurants it is known as the steam-fly. It is diurnal as well nocturnal, and may be seen running amongst the viands during the day. It abounds too in the Monkey House, at Belle Vue. It also occurs at Preston and in a cotton mill at Oldham. In Liverpool it is abundant, and has been reared from ova by Mr. R. McMillan, who gives a very interesting account of it. It is very much smaller than the preceding species, lighter in colour, and with the wings fully developed in both sexes. The capsule is of an oblong form, rounded at both sides and ends, and with transverse impressions. This species also devours bread, meat, cheese, and all kinds of obtainable substances.

Blatta americana is a large species, which has probably been introduced into this country through our commerce with America, where it is supposed to be indigenous. It is owing to the supply of food they obtain amongst merchandise that they attend the footsteps of commerce all over the world. This abounds in sugar works, india-rubber works, and dye works, in Man-

chester. It is also abundant in most maritime cities and towns, in warehouses, grocery establishments, and similar places. It often swarms in ships, where its ravages are sometimes so great that barrels of rice, corn, or other provisions are completely destroyed by them. Like the others they eject a dark coloured fluid from their mouths of a most disagreeable odour, which is extremely difficult to get rid of, and which attaches itself to whatever they walk over. The tegmina and wings are fully developed in both sexes, but are a little shorter and broader in the female. They are nocturnal in their habits, hiding during the day in crevices. They are fond of heat, and are generally to be found near boilers, bakehouses, fireplaces, &c. They devour bread-crumbs, flour, meat, cheese, woollen-clothes, shoes, and even the blacking on the latter.

Blatta lapponica.—This species is said by Linnæus to swarm in the huts of the Laplanders, and in conjunction with *Silpha lapponica* occasionally to devour the whole stock of dried fish in a single day. There appears to be some doubt about the species, as Curtis states that the English insect known by that name is sometimes abundant in the New Forest on ferns. It is also said to occur on whitethorn at Reading, and on Parley Heath, Dorset.

Acheta domestica.—The common cricket, is distinguished by the great length of its antennæ, the horizontal position of the wings and wing-cases when at rest, and when folded up forming a pair of long and slender filiments, often extending far beyond the extremity of the body. The jaws are strong, with several acute transverse teeth; the maxillæ are slender, with two acute terminal teeth. The abdomen is terminated by two long inarticulate setæ, gradually attenuated to the tip. It is a well known inhabitant of our houses, frequenting rooms on the ground floor, and preferring the warmer places near the fireplace, into the mortar of which they burrow almost close to the fire. There are probably few people who are not acquainted with the chirrup of the cricket, but their habit of flying into our faces and frequently into our food makes them obnoxious. I have often enticed them out of their burrows with bread-crumbs, which they seized and carried off into the recesses of their habitations. They are nocturnal in their habits, fond of moisture, and will eat any household refuse, such as the scumming of pots. They are often drowned in broth, milk, &c.; they are fond of beer, and may be caught in bottles half filled with it and set near their haunts. Although I like to hear their cheerful chirrup, I generally give them notice to quit, by putting Scotch snuff in their burrows, which I find to have the desired effect.

Ciphlorophum domesticum.—A small species of ant, like so many of our domestic insects, an importation. It was almost unknown fifty years ago,

but is now very common in many of our houses in Manchester, and in many maritime cities and towns. Sometimes it occurs in myriads. They attack our sugar, pastry, meat, confectionery, bread, cheese, &c., &c., communicating to all they come in contact with a very disagreeable odour. They creep into the substances they attack (everything eatable,) so that it requires very great care to avoid eating them at our meals. I know of a bakehouse in which they abounded to such an extent that the tenant was compelled to leave it, and also of a confectioner's shop that was given up for a like reason. Ants live in communities in which there are males, females, and neuters, but of this species I have only been able to obtain neuters. I am told that any place infected with these insects, may be cleared by closing the place a few days, and spreading chloride of lime.

Atropos pulsatorius.—This common mite belongs to the order NEUROPTERA. The head is large, the antennæ setaceous, mandibles corneous and strong, mixillary palpi salient, labial palpi indistinct and short, tarsi three jointed, wings wanting. It is dirty white in colour, with the eyes and a row of spots along the abdomen, brown. These insects are very destructive, and are often seen running about in neglected collections of insects, birds, animals, plants and in old books, in fact, on all kinds of material it is possible for them to eat. Sometimes they entirely destroy valuable collections of Natural History specimens. I am sorry to say that the entomological collection of the late Edward Hobson was entirely destroyed after his death, most probably by this insect. Its specific name alludes to the noise it is supposed to produce, similar to the ticking of a watch, and which is said by superstitious people to portend death.

Tinea lapetzella.—This is one of the clothes moths, a small but beautiful species. The female deposits her ova on woollen cloth, in which the larvæ make galleries that conceal them altogether from sight, when at their destructive work. All the clothes-moths are fond of dark places when in the larval state, woollen clothes kept in the light are less subject to their attacks than others.

Tinea pellionella.—The female of this species deposits her ova on woollen cloth, feathers, &c., on which the larva constructs a case of the material on which they feed, which it carries about with it wherever it moves. It is therefore always at home, and has only to put its head out of the case when it wants to feed. As it grows it enlarges this case, which is so ingeniously constructed that it is overlooked.

Tinea biselliella is a beautiful species, and as destructive as it is beautiful. The female deposits her ova on the linings of chairs and sofas, or

carpets, woollen cloths, natural history specimens, &c., in all of which the larva feeds. When full-fed the larva constructs a case in which it changes to a pupa. The above three species are a complete pest in houses and warehouses.

Tinea usticella.—The female frequently deposits its ova on cloth in houses, but oftener in birds' nests that are lined with wool or feathers.

Sphodrus leucophthalmus belongs to the order COLEOPTERA or Beetles, which are distinguished by having two horny or leathery wing-cases, and by the mouth having two transverse jaws. This species is generally found in cellars, damp kitchens, and outhouses. It is obnoxious in consequence of its running and creeping where our food is stored. It is nocturnal in its habits, but is not common. It is found in London and its suburbs, and in several other of our large towns, as Liverpool, Birkenhead, Ashton-under-Lyne, and Manchester.

Pristonychus terricola occurs in cellars and outhouses, and is often very abundant. It may be found in the day-time, under almost everything that is placed in cellars, coming out at night to feed.

Carpophilus hemipterus is found mostly in London warehouses and shops.

Carpophilus mutilatus has been found at the bottom of wheat stacks, at Clifton, near Manchester, and in the sweepings of flour, &c., at Pendleton, and in London.

Trogosita mauritanica is a flat, elongate insect, which has probably been imported. It is very injurious to stored up grain, upon which it feeds, especially when in the larval state; it is consequently common in granaries. The perfect insect is sometimes found in bread, in which it gets previous to baking.

Læmophlæus pusillus is found in the sweepings of flour at Pendleton, also in a granary at Cambridge, and is said to have been found in nuts at Sheffield.

Annomatus 12-striatus is a small yellowish species, about two-thirds of a line in length. It is apparently blind. It occurs in houses in London, Hull, and Hertford; it is also said to occur near the roots of young beets.

Silvanus Surinamensis is often found in sugar and sugar casks, also in bran, tapioca, macaroni, &c., in grocery and confectionery establishments, sometimes in abundance. It is frequently found floating in tea or coffee.

Nausibius dentatus is found in grocers and confectioners shops, and occasionally floating in tea or coffee.

Lathridius nodifer, L. transversus and L. minutus occur frequently in old books, probably owing to the books being musty or greasy.

Lathridius lardarius.—The larva has been found in a dried pig's bladder, the perfect insect has been found in books.

Typhœa fumata is found in books, eating through the leaves, probably owing to the books being musty or greasy.

Mycetæa hirta frequents fungi, and rotten wood, and occasionally does much damage by eating the corks of wine bottles, probably in consequence of the corks becoming mouldy, or in other words, in consequence of the corks being attacked with microscopic fungi.

Dermestes vulpinus. The ravages of the larvæ of these insects are mostly in the skins and carcases of animals, dried horns, books, paper, &c. Mr. Kirby is recorded to have discovered the larva in some specimens of asbestos called amianth, which they had perforated in various directions, undergoing their transformations therein. Mr. Westwood states that the above species was, some years ago, so injurious in the large skin warehouses of London, that a reward of £20,000 was offered for an available remedy, without, however, any being discovered. The same species is recorded to have destroyed an entire cargo of cork, by the immense number of this insect which fed upon it, both in the larval and perfect state, as well as upon the timbers of the ship. It is frequently abundant in the stores at Seedley Print works; also in some of the drysalters' and furriers' warehouses in Manchester.

Dermestes lardarius (the bacon beetle) is abundant in most of the provision shops in Manchester. They feed upon dried meat, bacon, and on the skins of animals. I have found them in a gamekeeper's museum, and my son has frequently found them in old books, where they are very destructive. When the larva is full-fed it bores holes underneath the counter, where it changes to pupa, and in the floor. In some of the Egyptian mummies, a number of dead specimens of several species of *Dermestes* have been found in the inside of the bodies, also a number of larvæ. These insects devour the tendons and integuments of skeletons of animals, which the flesh flies have left unconsumed, also horns.

Attagenus pellio.—The larvæ feed in skins, furs, and in old natural history collections, also on feathers in dove-cots and where poultry are kept, also on the dried integuments of animals, old bones, &c.

Anthrenus scrophulariæ is the carpet bug of the Americans. The larvæ are very destructive to carpets in that country. I have received mutilated specimens from the South of England, where they had fed on carpets.

Anthrenus musæorum is often found in the larval state in natural history collections, eating skins, hairs and feathers. From the minute size of these insects it is difficult to keep them out of boxes of insects. The larvæ seem insensible to the effects of camphor.

Anthrenus.—Various species feed on the dried skins of animals.

Corynetes cœruleus, ruficollis, rufipes, and violaceus, feed in the larval and perfect state on carrion and dead animal matter, dried skins, old bones, &c. They are sometimes found in calico printers' stores, dry-salters, &c. These insects seem to accompany *Dermestes*.

Ptinus sexpunctatus is found in houses in Scotland and Carlisle. When touched it simulates death. All the *Ptinidæ* are destructive, and rather resemble spiders.

Ptinus fur.—The larvæ are very injurious to herbaria, and other collections of natural history; also woollen cloth, wheat, and other grain in granaries. The sexes in this genus vary so much in form that they are often mistaken for other species.

Ptinus latro has been found feeding in collections of insects.

Niptus hololeucas resembles a yellow spider. This species was introduced into this country about fifty years since, through commerce, it is now a very common species, and doing a great amount of damage by eating holes, when in the larval state, into furniture, books, flooring, rolls of paper, bobbins of silk, &c., quite destroying the latter material. They have converted a bottle of dried sage, into a bottle of this species of insect, by feeding on it. It is a beautiful object for the microscope.

Niptus crenatus.—A much smaller species than the preceding, is often found devouring collections of natural history objects, it is also found in cellars in which provisions are stored and in bakehouses.

Mezium affine.—This is a curious looking creature, more like a spider than a beetle. When at rest on the walls of drysalters' warehouses it looks like a drop of blood, its elytra being smooth and shining. I am not certain on what it feeds, but it is probably destructive.

Gibbium scotias resembles the preceding species. It occurs in old houses, and drysalters' warehouses, it is probably destructive. It has been found in the ruins at Pompeii.

Gibbium?—An insect allied to the preceding one has been discovered in a bakehouse, by Dr. John W. Ellis, at Liverpool, the species is undetermined.

Anobium domesticum is one of the well-known death-watch beetles, an appellation given to several of this genus. The larvæ eat their way into chairs, tables, in fact into all kinds of wooden furniture, palings, branches of oak and cedar, rolls of paper, books, flooring, &c., from which they escape on arriving at the perfect state, sometimes in such numbers as to render the furniture and other material in which they have lived completely useless. In one instance these insects were feeding in the wooden portion of a cistern, which was lined with sheet lead, on arriving at maturity they actually bored their way through the lead. I have recently seen very carefully put away, in a large case, which is glazed on four sides, a great number of willow twigs, about half-an-inch in diameter, which once formed a large basket; they were eaten in such a way that it would be impossible for them to hold together much longer, the dust fell out of them whenever I moved them about. Mr. Thomas Kelsall states that the roof of the Theatre Royal, Manchester, was entirely destroyed by these insects, and had to be taken off and replaced, it was so infested that he could easily break up the timber of which it was constructed. These insects are also the cause of alarm to ignorant or superstitious persons, from the noise which they make, which resembles the ticking of a watch, and is the reason of their having the appellation of death-watch. Some people think it a sure sign of death, when the noise is heard. It is thought to be a signal, which is replied to by the other sex; they appear to pair outside of the burrows during the night. The larvæ seem to have the instinct to know when they are near the surface of the wood in which they are feeding, so that the perfect insect has little difficulty in making its escape. It is probable that the wood when it becomes a mere shell, or perforated mass, also becomes more sonorous, when the small but powerful jaws of the perfect insect, when eating its way out, can be more easily heard. Olivier thought the sound was produced by the larva, occasioned by the blows which they made to ascertain the thickness of the wood which remained unbored, before they reached the surface. A large cargo of cane which had been deported from Liverpool to Manchester, was entirely destroyed by these insects. I have a bamboo which is perforated by them. It is necessary that all empty boxes, baskets, and wooden articles which are not actually in use, should be kept in out-buildings, so as to prevent, as far as possible, this insect from getting into the main buildings. It is possible that many of the buildings in this city and the suburbs will have to be partially pulled down before twenty years are over in consequence of the ravages of these insects. Although

these insects are so abundant, there are a great many people that have never seen one. It is nocturnal in its habits, and if searched for amongst infested material before dawn, from June to August, it will often be found abundantly.

Anobium paniceum.—A smaller species than the preceding, is very abundant in furriers skin warehouses, natural history collections if neglected, herbaria, amongst skins of birds, and animals, on which the larvæ feed. In fact they feed upon almost every substance, on caper tea, dried culinary herbs, ginger, cayenne pepper, Turkey rhubarb, cantharides, belladonna, hellebore, even perforating tinfoil, and rendering ship biscuits unfit for use by feeding and breeding in it.

Xestobium tessellatum is found in old furniture and wainscoting, and in old oak trees in Dunham Park. It is much larger than the preceding species, and is one of the death-watch beetles, it occurs more frequently in country houses, where probably it has hastened the dissolution of many an invalid.

Ernobius mollis is sometimes found in pine or deal floors, but oftener in a branches of *Pinus sylvestris*.

Ptilinus pectinicornis is a small and cylindrical species. The male has very beautiful pectinated or comb-like antennæ. I have often found this insect feeding on oak and willow. Mr. Westwood found this species feeding on the bedpost, in myriads, which they completely destroyed in three years.

Lasioderma serricorne.—I have never met with this species, but it has been found feeding on gum-sumach by Mr. Westwood, also captured by Mr. Hope, in his library in London, where it is supposed to have escaped from the bodies of exotic insects.

Rhizopertha pusilla occurs in granaries and corn stores, where it feeds on wheat, from which I have obtained it.

Blaps mortisaga occurs in houses in the north of Scotland, from whence I have received it. It is extremely rare, or perhaps it is oftenest met with by those people who do not study Entomology.

Blaps mucronata with us bears the name of black beetle, which is correct. They are very common in houses, and slow in their movements, carefully lifting one leg at a time, although I have seen one run very quickly. They are nocturnal in their habits, and are sometimes very abundant in kitchens, churchyards, coal pits, and stables. They emit a very disagreeable odour, which is difficult to get rid of. Instances are recorded where the larvæ are said to have been discharged from the human stomach, in one case as many as 2,000 larvæ of this insect were so discharged at various times, as well as one pupa.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 2, 1887.—Dr. D. SHARP, President, in the chair.

The Rev. T. W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, L.R.C.P., of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. M'Dougall, of Blackheath, were elected Fellows.

Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia caja*, one of which was bred from a larva fed on lime-leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in Lepidoptera.

Capt. H. J. Elwes exhibited a large number of Lepidoptera-Heterocera caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th of August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species,—which was believed to be a larger number than had ever before been caught in one night,—including Bombyces of the genera *Zeuzera*, *Stauropus*, *Dasychira*, *Lophopteryx*, &c.; Noctuæ of the genera *Diphthera*, *Graphiphora*, *Gonitis*, *Plusia*, &c.; and Geometræ of the genera *Boarmia*, *Odontoptera*, *Urapteryx*, *Cidaria*, *Acidalia*, *Pseudocoremia*, and *Eupithæcia*. Capt. Elwes stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from sixty to eighty species, and during his stay he had collected between 600 and 700 species.

Capt. Elwes also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, not many miles distant from these hills. In consequence of the unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale.

A discussion ensued on the remarks made by Capt. Elwes, in which Mr. M'Lachlan, Dr. Sharp, Mr. Champion, Mr. Kirby, and others took part.

The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight.

Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platyarsus hirtus*.

Mr. F. Grut said he was requested by Mons. Peringuey, of Cape Town, to announce that the latter was engaged on a monograph of the genus *Hipporhinus*, and that he would be glad to receive specimens and other assistance from British entomologists.

Mr. Gervase F. Mathew communicated a paper entitled "Descriptions of new species of *Rhopalocera* from the Solomon Islands."

Mr. George T. Baker communicated the following papers:—"Description of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus"; and "Description of a new genus of *Rhopalocera* allied to *Thecla*."—H. Goss, Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

February 24th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Messrs. J. E. Kelsall, J. Lea, and E. B. Nevinson were elected members. Mr. Tutt exhibited *Tephrosia crepuscularia*, Hub., from Hungary, and remarked that he was unable to obtain any forms of *T. biundularia* from there, although he had received it from Germany; he further showed continental forms of *Agrotidæ* and specimens of *Acidalia perochraria*, Fisch., and contributed notes. Mr. R. South *Lobophora polycommata*, Hub. (bred). Dr. Rendall *Calocampa solidaginis*, Hub., from Cannock Chase. Mr. Tugwell, English and Scotch forms of *Lycæna Adonis*, (*bellargus*, Rott). Mr. Adkin, *Notodonta zizac*, L., *Dianthæcia capsophila*, Dup., *Aplecta herbida* (*prasina*, Hub.) and *Eupithecia pumilata*, Hub., from County Cork, with specimens from various English localities for comparison.

In the Mollusca Dr. Rendall exhibited British and land and fresh-water shells, and Mr. Cockerell *Succinea putris*, L., sub-sp. *S. parvula*, Drouët, a small shell of the "*putris*" group not previously recorded as British, collected by Mr. J. H. James, at St. Columb, Porth. Cornwall.

Mr. J. J. Weir read a paper "On Melanism," and said he had read and carefully studied Mr. Dobree's paper on this subject, and so far as he knew there was no connection between the tendency to Melanic variation in Lepidoptera, and the high latitude they might have been produced in; but on the contrary he found that so far as the Lepidoptera of Russia in Europe were

concerned, of the 300 species he had received from St. Petersburg, none showed the slightest melanism. He was not, however, disposed to think that this fact destroyed Lord Walsingham's theory as Mr. Dobree had stated, but it modified and confined the phenomenon to the higher latitudes of the British Isles, and to high altitudes. He had, whilst travelling on the continent, noticed the extreme clearness of the atmosphere. In Bohemia, Italy, and Spain, this was the case in the greatest degree, and in the mountains of Switzerland and the Tyrol it was almost as great, but constantly interrupted by dense mists and clouds; it was precisely in these altitudes, that melanism became rather the rule than the exception. This uncertain condition of weather was characteristic of the British Isles, and the result was that our indigenous lepidoptera were, as a rule, darker in colour than the continental, and the tendency to melanism increased northwards until it might be said to culminate in the Shetlands. If he was correct in his views—and he thought the facts brought forward were in accordance with Mr. Dobree's—then it followed that in the British Isles and in the mountains of Europe, it was essential to the imagines of lepidoptera that they should rapidly take advantage of transient gleams of sunshine, and this the darkening of their colouration enabled them to do.

Mr. George Smith of "The Scropticon Company" then gave an exhibition of photo-micrographic slides, being photographs of the enlarged image of the microscopic object.

March 10th, 1887.—The President, in the chair. Messrs. D. J. Rice and H. H. Druce were elected members. Mr. Goldthwaite exhibited male and female specimens of *Nyssia hispidaria*, Hub., bred by him this year. Mr. J. W. Hater, a variety of *Arctia caja*, L., having the red colour replaced by a yellowish or buff colour, and he stated that it had been bred by Mr. Mutch, of Hornsey, who had fed a number of larvæ on lime, and others on the usual food-plants of the species, with the result that all those fed on lime produced yellow varieties, the others being normal. A discussion ensued as to the effect of strange foods in rearing varieties. Mr. R. Adkin, *Hermia* (*Zanclognatha*) *tarsipennalis*, Tr., and remarked that nearly twelve months had elapsed, between the escape of the eggs and the emergence of the imagines. Mr. Billiups exhibited *Tapinoma melanocephalum*, For., taken in the Palm House, Kew Gardens, on a species of palm (*Howea grisebachia*) from Tropical Australia, and he stated that it was the first recorded capture in Europe of this ant, and brought the number of exotic ants found in Kew Gardens, by Messrs. Smith, Saunders and himself up to seven species. Mr. E. Step contributed a paper on "Mosses" which was illustrated by diagrams and the exhibition of microscopical specimens.—H. W. BARBER, Hon. Sec.

CLYDESDALE NATURALISTS' SOCIETY.

The usual monthly meeting of this society was held on Wednesday evening, 16th March, in the society's rooms, 207, Bath Street—Mr. T. J. Henderson, President, in the chair. The following gentleman were proposed as members: Messrs. Nathaniel Dunlop, D. C. Glen, Rev. A. B. Watson, India. Mr. Robert Dunlop exhibited a large specimen of cone-in-cone limestone, and gave a very interesting account of the collapse spherical structure in limestone, shales, and other minerals. He attributed these markings to the action of gas, which forced a passage through the material when in a soft or clayed form, and the passage thus left open, becoming filled with other matter, produced those markings we now find in limestone and other substances. This theory gave rise to some little discussion among the members, which proved very interesting. Mr. Dunlop also showed a slab of slate, bearing a beautiful impression of a large fern (*Neuropteris lochii*), which he had found with other five specimens at Airdrie; this specimen, he believed, was one of the finest of the kind in Britain, and he was certain that the bed from which it had taken would prove one of the most productive in fossil ferns in the country. A shaft was about to be driven through it, and he was looking forward to a rich harvest of specimens. Geologists visiting Airdrie should not forget this splendid collecting field. After some further discussion, Mr. Duncan McLellan, Superintendent of Parks, read a paper on "Meteorological Notes and Remarks upon the Weather during the year 1886, with its general effects upon Vegetation." The paper gave a short description of the weather experienced during each month separately, with the average temperature, and the effects upon fruit and flowers. The first four months were noted, not so much for severe weather, as for an exceptionally low temperature. May was not a genial month, and vegetation was in a very backward state. June was the driest, while September was the wettest month of the whole year. July was the only really summer month of 1886, whereas August was most unpropitious to the agriculturalist. November was mild, but December was so cold that the action of the frost made a rent half-an-inch wide and two inches deep in a Canadian poplar, in Kelvingrove Park; when a thaw set in this split closed up. This interesting paper led to a long and most instructive discussion.—JOHN MACKAY, Hon. Sec.

O B I T U A R Y .

JOHN SANG.

It is with feelings of great regret I record the death of John Sang, one of the oldest entomologists in the North, and one whose knowledge of British

Lepidoptera was most full and complete. For more than forty years he has been a hard working Lepidopterist, giving during the greater part of this time, special attention to the smaller species.

John Sang was brought up a draper, and succeeded to his father's business in the High Row, Darlington, which he followed energetically, (as he did everything he had to do), for about twenty years; then having realized a competency, he retired, and gave nearly all his time to his favourite pursuits. Some five or six years ago, he had the misfortune to lose not only the greater part of his savings, but he was obliged to sell his collection to relieve himself from a liability he had incurred by becoming security for a friend. Thus at one stroke losing not only his independency, but his dearly loved insects, the result of so many years labour, and many of which, rare or now extinct species, it was not possible to replace. To an ordinary man this would have been a fatal blow, but John Sang accepted the inevitable with the greatest equanimity, sought and found work he was well qualified to do, and commenced when he was over fifty years of age to form a new collection. Among his entomological effects was one that attracted particular attention, and that ultimately realized a large sum. This was a copy of Stainton's well known Manual, illustrated by coloured figures by himself. These life-size figures of the whole of the British Tinea, are to-day the most valuable set of figures in existence. His ability to depict minute objects with absolute fidelity becoming known, he was ultimately engaged by Dr. Mason, of Burton-on-Trent, to paint figures of Coleoptera. These figures are perfect marvels of painstaking, conscientious work, not to be surpassed and scarcely to be equalled. Every puncture, even of the most minute species, is absolutely depicted in the drawings. At the time of his death he had figured nearly all the BRACHYLITRA, being then engaged with the *Homaliidae*. Had he been spared but a few weeks longer he would have completed this large and difficult group.

His knowledge of British Lepidoptera has been mentioned. It was indeed most full and complete. Species that had been seldom taken he knew all about; where and when the examples had been met with, and in whose possession they were. His knowledge of the larvæ and their food was equally great. To his acquaintance with the correct food of *Mniophila cineraria* we are indebted to the detection of an attempted swindle. Bred specimens were offered for sale, from larvæ said to have been found on trees in the New Forest. "Nothing of the kind," said he, in his rather abrupt and unhesitating manner, "the larva feeds on wall lichens, not tree lichens at all." This of a species that only once had been recorded as British, and of which most collectors had no knowledge at all. So, too, his intimate acquaintance with the forms of all British species, enabled him to pronounce with certainty

that a supposed new species was only a poor specimen of *N. augur*. Twice the writer has been present when an insect Mr. Sang had never seen before was submitted to him to name. The first was a few years ago, when Mr. Robson showed him an example of *Harpella bracteella*. "Where did you get it?" was his first remark. "Never saw it before," was his second. "You have the *Annual* for 1859?" "Yes." The *Annual* was produced, and the species was found figured on the plate. "Only three others known, two taken at Shotley Bridge, and one in Wales," was the further information, given unhesitatingly. The second case was still more marked, for it was an insect of which he had not seen a British specimen. I had bred a pretty little moth from some fungus gathered to breed beetles from, and as I was passing through Darlington, I took it with me alive, to let him see. The moment he saw it his eager enquiry was—"Where have you got that?" "Bred it." "What from?" "Fungus, don't you know it?" "Never saw it in my life before, but there is only one thing it can possibly be, *Tinea picarella*." And *Tinea picarella* it was, and pleased indeed was he to receive two or three more specimens I was fortunate enough to breed. With knowledge so full as to name at sight, species he had never seen before, it can readily be understood how valued a companion he was on an excursion, or how useful as a correspondent. Yet with all his knowledge he was so modest and unassuming, that he needed to be asked before he drew upon his exhaustless stores. Nor did he hesitate to impart unpublished facts, even to those who were likely enough to pass them off as their own. Mr. Gregson informs me that Mr. Sang was one who won the grand prize offered many years ago by Mr. Stainton, viz.: a complete set of the "Natural History of the Tineina," given to those who first discovered and communicated the transformations of twenty species with which he (Mr. Stainton) was unacquainted. Though this was so great a feat to accomplish, and though I have been on terms of great intimacy with Mr. Sang for several years, I never once heard him refer to it, and was indeed unacquainted with the fact till I learnt it from Mr. Gregson since Sang's death.

Richmond, in Yorkshire, was perhaps his favourite hunting-ground, nor did he hesitate about walking home to Darlington, a distance of 12 miles, after a hard day's collecting. But he collected assiduously wherever he went, and knew the exact place where to look for every species he had ever taken. Castle Eden and Hezledon Denes, and Black Hall Rocks near here, were as familiar to him as to those of us who have better opportunities of exploring them. At home he worked hard, and I have heard him say a year had never passed without his adding at least one new species to the Fauna of Darlington.

I cannot pretend to give a list of the species he has introduced to the British Fauna, or to Science. In the first Volume of the *Entomologists' Annual*, published in 1854, his name appears as the discoverer of *Miana exposita*. In the last volume of the *Entomologists' Monthly Magazine* (1886), he figures as the introducer of *Gelechia tetragonella*, another species new to science, found in the salt marshes near here. He was never anxious to have his name in print, and whatever species he discovered he allowed others to describe and name. *Gelechia Sangiella* was named in his honour by his friend Mr. Stainton; it was another of the species new to science, he discovered and worked out.

Mr. Sang was never married, yet was a thoroughly domestic man, fond of home, and very fond of children, who seemed to know his liking for them intuitively and took liberties with him accordingly. He was also passionately fond of music, especially sacred music. He was one of the founders of the Darlington Choral Society, and it is said, he could sing most of the oratorios without the music.

He passed away in his sleep, between Saturday the 19th and Sunday the 20th March, quite unexpectedly. He had suffered for a long time from an internal complaint, which though troublesome and occasionally painful, was not likely to prove fatal, and he died of heart disease, which he was not suspected to be afflicted with. Quiet and unassuming in life, his death was equally quiet. He could not have borne to be a trouble to those about him. He was interred beside his mother, in Darlington Cemetery, on Tuesday, March 22nd.—JOHN GARDNER, Hartlepool, 26th March.

NOTES ON LEPIDOPTERA.

By B. LOCKYER.

(Continued from page 56.)

N. RUBI.—One specimen at sugar, Bishop's Wood. September.

N. BAJA.—Rare at sugar. August. Highgate, Hampstead, and Lyndhurst. The larva feeds on hornbeam, bramble, bird-cherry, &c; it may be taken (generally just about to change its skin) about the beginning of April to beginning of May, and is then pale pinkish ochreous, with smoky lozenges outlined down the back and oblique smoky lines along the sides; it is very delicate, and subject to the attacks of a small *Microgaster* (?) spinning a bright canary-yellow cocoon outside the larva after its escape. I have never captured a full-fed larva, and like the *Xanthia* it remains rather over a month

in its chamber underground, without becoming a pupa. The pupa is also delicate, and the same colour as *M. oxyacanthæ*.

N. NEGLECTA.—Saw specimens taken in Denny and Whitley Woods, New Forest, by Mr. G. Tate. September. He said it was not uncommon.

N. XANTHOGRAPHÆ.—On palings, at light, sugar, but chiefly by mothing amongst rank herbage. On flowers of dock and burdock in August and September. On one occasion I had my net full, and moths settling all over it, and on my clothes, apparently attracted by drops of sugar accidentally dropped on them. Everywhere, excepting Whitby and North Devon where I did not sugar; the only species I could attract in Monmouthshire.

T. RUBRICOSSA.—At willow bloom. Bishop's Wood and New Forest. April.

T. INSTABILIS.—At sugar. Willow bloom and at rest on a house wall. March to May. Very rare. Camden Town, Bishop's Wood and Pondhead Inclosure, New Forest.

T. GRACILIS.—Rare at willow bloom. Bishop's Wood and Denny Wood, New Forest. 2 specimens only. March and April.

T. MINIOSA.—Not common at willow bloom. Denny Wood, New Forest. March and April. The larva common every season in June.

T. MUNDA.—Not common. Pond-head and Hurst Hill Inclosures, New Forest. March.

ORTHOSSIA YPSILON.—The larva very abundant under the bark of willow trees on the Heath at Hampstead.

O. LOTA.—At sugar. Bishop's Wood. September. also New Forest (G. Tate.)

O. MACILENTA.—Ditto.

ANCHOCELIS RUFINA.—At sugar. New Forest. Teste G. Tate.

A. PISTACINA.—At sugar and on lamps. September. Open heaths (Vale of heath, Hampstead) and woods (Bishop's Wood and Highgate Woods.) Common.

A. LUNOSA.—Ditto. Very common.

A. LITURA.—Ditto. Rare.

DASYCAMPA RUBIGINEA.—At willow bloom. New Forest. Rare. April. G. Tate.

OPORINA CROCEAGO.—At willow bloom. Denny Wood. New Forest. Rare. March and April.

XANTHIA CERAGO AND SILAGO.—At sugar. New Forest. September. G. Tate.

X. AURAGO.—Ditto. Rare. Denny Wood.

X. GILVAGO.—Ditto.

X. FERRUGINEA.—At light and at sugar. Gardens. Camden Town. Rare. September.

DICYCLA Oo.—Abundant at sugar. July, 1871. Hollands Wood. New Forest.

COSMIA DIFFINIS.—The larva rare in the lanes about Highgate and Hampstead, in June.

C. AFFINIS.—The larva common in the same localities at the same time. Also saw the imago at sugar in the New Forest, both at Minstead, and in Park Ground Inclosure. August, 1871.

EREMOBIA OCHROLEUCA.—On flowers of thistle. Waste ground, near Hadleigh Castle, Essex. August. At rest by day.

HECATERA SERENA.—At rest on fences and trunks of trees near waste places (about five feet from the ground.) May be also taken fluttering among the sow thistle at dusk. It flies *low* and frequently settles back downwards, and never with erect wings like a *Plusia*; but like that insect it is lively and does not settle for long. July and August. Kensal Green (Middlesex.) Alexandra Park estate, near Wood Green; and near Denny Wood, New Forest. Not very common. G. Tate.

EPUNDA NIGRA.—Reported as being rare at sugar, in Denny Wood, New Forest, in September. G. Tate.

E. VIMINALIS.—Said to have been taken at sugar and as a larva in Bishop's Wood, Hampstead, and near Shirley Heath, Surrey.

MISELIA OXYACANTHÆ.—September. Common at sugar. Woods and lanes. The larva common in almost every hedgerow about North London by night, in April and May. There is an extraordinary variety of this larva (common in the New Forest, but not near London so far as I am aware) which is evidently a case of protective mimicry or else a distinct species; being pale greenish-white, like the lichens which there clothe its food-plants, blotched unevenly with a rather transparent dead leaf green tint. The usual markings remain in outline. This larva is another example of the class that take some time to make up their minds whether they intend to become pupæ or not, and is best reared in a cage with plenty of earth and left to itself after burying, except for an occasional "damper." Hampstead, Highgate, Wood Green, &c., and in the New Forest. The variety *Capucina* used to occur in Bishop's Wood, Hampstead.

AGRIOPIS APRILINA.—The larva rare at Lyndhurst in June.

EUPLESIA LUCIPARA.—Rare at sugar. Woods and lanes near Bishop's Wood, Highgate Woods and New Forest. July.

APLECTA HERBIDA.—Common at Sugar. Pond-head and Park Ground Inclosures, New Forest. 1874 and 1875. June and beginning of July.

(To be continued.)

BOOKS RECEIVED.

“The Larvæ of the British Butterflies and Moths. By (the late) Wm. BUCKLER, edited by H. T. STANTON, F.R.S.

Vol. II.—The Spinges or Hawk-moths, and part of the Bombyces.”

BEING THE RAY SOCIETY VOLUME FOR 1886.

The circumstances leading to the publication by the Ray Society of the figures, &c., of the larvæ of our British Lepidoptera, by the late Wm. Buckler, was fully detailed in our remarks in the first volume (See Y.N. Vol. VII. p. 44.) They may therefore be very briefly alluded to here. Mr. Buckler for many years had been carefully figuring the larvæ of British Macro-Lepidoptera, and on his sudden and unexpected death, the whole of his drawings and note books were purchased by the Ray Society. It was found that of many species, carefully figured long ago, no description had been published, nor could any be discovered in the note books. The Rev. John Hellens, who had been closely allied with Mr. Buckler in his work, came to the rescue, and aided by numerous correspondents, made a most successful effort to fill the blanks, succeeding so well that in the last volume only four species of which figures had been taken, were left undescribed.

The second volume was intended to include the larvæ of the Hawk-moths only, but the fulfilment has been better than the promise, and it actually includes figures of the larvæ of twenty-seven species of Bombyces, making it possible to complete the Bombyces in the third volume. The completeness of the series is really astonishing, and only those who had seen Mr. Buckler's lists of desiderata, could have expected to find so many species figured. The preface says that figures of four species are wanting, these being *Naclia ancilla*, *Charocampa nerii*, *Trochilium vespiforme* and *Allantiforme*. We certainly do not include *Naclia ancilla* among British species, and *Charocampa nerii* is only a rare visitor, and is actually placed among the reputed species in our recent catalogue. Figures (from Continental larvæ) are given of several species, whose claims for retention on the British lists are

more or less doubtful, such as *Sphinx pinastri*, *Notodonta tritophus*, and *Gluphisia crenata*. While the figures are so nearly complete, descriptions of the larvæ from the pen of Mr. Buckler, are fewer in proportion. This want, however, Mr. Hellens has most ably supplemented, giving descriptions or additional notes, in the case of no less than 45 out of the 63 species included in the volume. We think this is really a wonderful amount of work to have accomplished. There are only seven remaining without any larval description, viz., *Acherontia atropos*, *Chærocampa celerio*, *Sesia bombyli-formis*, *Trochilium scoliceforme*, *culiciforme*, *formicæforme*, and *philanthi-forme*. We see no reason why these descriptions should not be given in an appendix to a future volume if opportunity afforded. With Mr. Hellens it is evidently a labour of love, and we should be glad to find he was able to render the work absolutely complete.

With regard to the plates themselves, they are quite up to the standard of the plates of butterfly larvæ. As we examine them in detail, we are charmed with the exquisite fidelity of some of those with whose appearance we are familiar. Yet when anything unusual attracts our notice, we can but regret that the letterpress gives us no particulars of these forms. For instance, fig. 3b on plate xxx, differs greatly in colour from any larva of *Humuli* we ever saw, and it has scarcely a trace of the horny plate on the second segment. Not doubting for a moment that it is a strictly faithful representation of the larva, we would have liked to know more about it. So too, fig. 1 on plate xxxv., is very different from any of the brown forms of the larva of *Dictæa* we ever saw. It has a spotted white band between the segments, and several of the spiracles are enclosed in a large oblong black blotch; nor is there the usual yellow spiracular line. We repeat that we do not doubt the accurate fidelity of the representation, but a word or two about the peculiarities would have been interesting. Mr. Hellens speaks of the great similarity in the larvæ of the genus *Hepialus*, but adds "if they could be compared together in life, no doubt good points of distinction could be found." We would refer also to the three commoner burnets, *Trifolii*, *Lonicæræ*, and *Filipendulæ*. Not only are the larvæ very much alike, but they all vary to a considerable extent. *Lonicæræ* only is described by Mr. Buckler, so that no comparison of them is made. We are pleased to see figures of *Exulans* and *Nubigena*, and to find they at anyrate are distinguishable enough as larvæ.

The next volume, to contain the remainder of the Bombyces, will not be issued till 1888. We regret we have to wait so long for it, but all the members of the Ray Society are not so much interested in Lepidoptera and their larvæ as we are.

The YOUNG NATURALIST:

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VOL. 8.

LYCÆNA AGESTIS, W.V.

The Brown Argus.

L. ARTAXERXES, Fab.
The Scotch White-spot.

L. SALMACIS, Steph.
The Durham Argus.

By JOHN E. ROBSON.

A Paper read at the Haggerston Entomological Society, and published by request.

NO British butterfly has given rise to more discussion, and difference of opinion, nor has any had a more curious and complicated history than *Lycæna agestis*. It has been split first into two, and then into three species; then they were reduced into two again, and finally all were united in one. Two different descriptions of the larva have been given; twice at least the larva of a beetle has been mistaken for it, and to finish with it has had as many aliases as a pickpocket, and it is not quite settled which is its proper name and which are aliases. Even the food-plant has lent its aid to complicate the matter, and the difficulties on this point are not yet cleared up.

Agestis appears to have been first noticed by Petiver, in 1717, but Lewin in his "Insects of Great Britain," is generally considered the first to introduce the species to the British Lists. I need hardly describe it, but it has the wings very dark golden brown above, with a black discoidal spot, and a row of orange lunules at the hind margin. The underside is greyish brown, with a number of white spots with black centres, and a row of orange lunules as in the upperside. None of the spots are nearer the base of the wing than that at the disc. The spots themselves have been described appropriately enough as black in a white ring. You will see when I speak of the next form why I prefer to call them white.

Artaxerxes was first described and named by Fabricius, in 1793, and is also introduced to the British Fauna in Lewin's work named above. Its difference

from *Agestis* is now well known; the discoidal spot is white instead of black, the marginal lunules are wanting or nearly so, and the white spots of the underside have no black centres. So rare was this butterfly when first discovered—it does not occur on the Continent—that Fabricius described it without seeing a specimen, and we are told the custom obtained of pinning a coloured drawing of it into the drawer, as an actual specimen was unobtainable. At this time, so far as I know, the larva was not known either here or on the Continent.

Salmacis was described (from specimens taken at Castle Eden Dene, Durham), by the late C. J. Stephens, in the third volume of his "Illustrations." In appearance it is intermediate between the two others, and the place of capture being also intermediate between the Scotch and English localities, the idea very naturally arose that they might all be forms of one species, and the discovery of the larva now became of great importance.

I do not know by whom the larva was first described. Zeller in the year 1840, recorded that "the eggs are laid on the underside of the leaves of *Erodium cicutarium*, often several together but scattered." He described the larva as "pubescent and greenish with darker dorsal line and rosy lateral margins." At this time he did not succeed in rearing the imago. In Westwood and Humphreys "British Butterflies," issued in 1840-41, the larva was described as being "green, with a pale augulated row of dorsal spots and a central brownish line." The food was again given as Heron's Bill, *Erodium cicutarium*. This description of the larva, it will be observed, does not agree with that by Professor Zeller, and in fact is not correct; when controversy arose on the subject, Professor Westwood admitted that he had copied it, but had forgotten his authority. It was almost certainly from a Continental source. By this time *Artaxerxes* had been found in many localities in Scotland, and rather freely at Arthur's Seat near Edinburgh, where Mr. Logan subsequently found the larva feeding on the common Sun Cistus (*Helianthemum vulgare*.) This discovery considerably affected the growing opinion that *Agestis* and *Artaxerxes* were but one species, but no further progress was made then towards the elucidation of the matter. In Stainton's "Manual" (Vol. 1. 1857), the two were given as good species, Westwood's erroneous description of the larva of *Agestis* being quoted, and the food given as *Erodium cicutarium*, and Logan's manuscript description of the larva of *Artaxerxes* with the food *Helianthemum vulgare*.

In 1858, Mr. H. J. Harding, in the "Zoologist" claimed to have discovered the larva of *Agestis* on Heron's Bill about eight years before, and in the "Entomologists Weekly Intelligencer" for the same year, he offered to supply any applicant who would send box and return postage, with larvæ.

These larvæ, however, or others sent cut by Mr. Harding, did not produce *Agestis*, but a small weevil (*Hypera jasciculata*, a blunder that we will find repeated at a later date by Professor Zeller. I find no proof that Mr. Harding ever bred the butterfly from these *Erodium* eating larvæ, but surely he must have done so. In this year appeared a most valuable contribution to the controversy, perhaps the most important of all. It was published in the "Transactions of the Tyneside Field Club," and was from the pen of the late George Wailes of Newcastle-on-Tyne, and was introduced into his "Catalogue of the Lepidoptera of Durham and Northumberland," of which I regret to say only one part ever appeared. In this paper Mr. Wailes traced the butterfly from its Northern to its Southern localities, showed that it occurred in many places where *Erodium* did not grow, but that no form of it was found at any place where *Helianthemum* was not found also. He also ventured to prophesy that when the larva was accurately known "the *Helianthemum* will as surely prove to be its food, as its presence indicates the place of flight." Mr. Harding, however, would not yield his point. Mr. Logan showed him a coloured drawing of the larva of *Artaxerxes*, which he did not recognize as being the same as those he found on *Erodium*. On July 3rd, 1859, he writes to the "Intelligencer" in rather a sarcastic vein, "those who expect to take the larva of *Agestis* on the *Helianthemum* had better look out, as the larvæ are half-fed on the Sea Cranes-bill." I call special attention to the date of this communication, for it is clear if the larva were half-fed on the 3rd July they could not be *Agestis*, as we will see bye and bye.

In 1867, Professor Zeller published a Natural History of *Lycæna medon* (*Agestis*), in the Entomologists' Monthly Magazine. It is an article of great interest, and we learn from it that in 1861, Wilde in his work "Die Pflanzen and Raupen Deutschlands," knew nothing of the larvæ of *Agestis*, and that in 1865, Kirby included it among species of which "les chenilles ne sont connues," in a paper communicated to the "Annales de la Societe Entomologique de France." Since 1840, he (Zeller) had made several attempts to find the larva, but was not successful till 1866, when he saw a female ovipositing. He found the egg on the underside of a small leaf of *Erodium*, and by subsequent visits to the locality got together about 50 larvæ, excluding some that proved to be the larvæ of the weevil that misled Mr. Harding. The egg was deposited on 22nd August, and the larvæ were found from the 5th to 11th September. After hybernation they commenced feeding in February, and by the beginning of April were full-fed. I am particular about the dates, as the question of whether Mr. Harding's larvæ were *Agestis* or not, can, I think, be settled by a careful examination of the dates. Professor Zeller, at the conclusion of his paper, argues against the opinion (for

it was nothing more than an opinion in 1867), that *Artaxerxes* and *Agestis* were but forms of the same species. "It appears," he says, "now to be generally accepted that *Lycæna artaxerxes* is only a variety of *L. medon*. The former in the larva state feeds on *Helianthemum vulgare*. Although it appears to me extremely improbable that the larva of *L. medon* should habituate itself to this food, and although I even doubt whether it could be fed with species of *Geranium*, yet I will endeavour to make some experiments on this head.....I do not recognize in my four English *Salmacis* any transition to my ten specimens of *Artaxerxes*, in all of which the black transverse streak in the white discoidal spot of the anterior wings is entirely wanting."

In 1868, the late William Buckler figured and described the larva of *Artaxerxes*, from specimens found at Edinburgh. The descriptions of *Agestis* given by Professor Zeller and that of *Artaxerxes* by Mr. Buckler might well apply to the same larva. I find no further record on the subject till 1879, when I made a systematic search at Black Hall Rocks near here, and found five larvæ feeding upon *Helianthemum*. These were forwarded at once to Mr. Buckler, who in expressing his pleasure at their discovery, informed me he could detect no difference between those I sent, and his figures of *Artaxerxes*. The following month he successfully reared three butterflies, and singular to say, these three, while most resembling *Salmacis* on the underside, had on the upperside the characteristics of the three different forms, one being *Agestis*, the second *Salmacis*, and the third *Artaxerxes*. This result made Mr. Buckler more anxious still to obtain larvæ from a Southern locality, and in the September following, Mr. Jeffrey sent him eggs deposited by a typical *Agestis* in Kent. These eggs were deposited on *Helianthemum*, on which the larva fed. The butterflies were produced the following year, and thus was Mr. Wailes' prophecy fulfilled twenty years after it was made. I have now traced the butterfly from the earliest notice of it, down to the time when Mr. Buckler bred every form of it from larvæ, from the localities of their named varieties, all the larva feeding on *Helianthemum*.

But what about the *Erodium*? Professor Zeller had proved just as conclusively that the species fed on this plant, as the British collectors had proved that it fed on *Helianthemum*. The question now arises, will British larvæ eat *Erodium*, or will Continental larvæ eat *Helianthemum*? Both these points are yet unsettled, and I will briefly note what has been done or recorded on the subject. First there is Professor Westwood's statement that the larvæ fed on *Erodium*. This was published in 1840, the year in which Professor Zeller first found them. It may be that Westwood's forgotten authority for his statement was Zeller himself, though Westwood's description of the larva is not correct. It may even be that the larva of *Hypera fascicu-*

lata was accidentally described instead of the *Lycæna*. This, however, is only conjecture. Next we have Mr. Harding's reported discovery of the larva on Herons-bill. It is to be regretted that Mr. Harding does not give the scientific names of his plants. He calls it Herons-bill at first, giving the proper name *Erodium cicutarium*, in the "Zoologist," but in his last communication on the subjects he calls it "Sea Cranes-Bill." *Erodium* is generally called Herons or Storks-Bill, and various species of Geranium are called Cranes-Bill. In many places *Geranium sanguineum* grows in the same places as *Helianthemum vulgare*. In this part of the country we call *G. sanguineum* the Bloody Geranium, but growing as it often does, on sea-side sand banks, it is a very likely plant to be called the Sea Cranes-Bill. On this plant I once found a larva of *Agestis* myself, but I do not believe it was feeding upon it, but wandering about seeking a place for pupation. Larvæ sent out by Mr. Harding undoubtedly produced *Hypera fasciculata*, and I have searched in vain for any record that he bred *Agestis* himself, or that any one else ever did so from his larvæ. I cannot but think he must have done so himself, and again venture a conjecture to explain the difficulty. My suggestion is that Mr. Harding among the *Curculio* larvæ did get one or more full-fed larvæ of *Agestis*, that had wandered from their food seeking a place to pupate; that these producing the insect led to the assumption that all were *Agestis*. But, thirdly, we have a statement by the late Edwd. Newman that Mr. Young, of Edinburgh had eggs of *Artaxerxes*, the larvæ from which "preferred the leaves of the Scarlet Geranium to those of the Sun Cistus." Again we are in doubt as to the plant meant by "the Scarlet Geranium." If the young larvæ preferred a geranium to the *Helianthemum*, it would seem to be a natural food, but the record greatly wants confirmation. It is certainly singular we have so many of these loose statements about a larva that in this country has only been found to feed on *Helianthemum*. But the most singular fact remains to be told. Professor Zeller, having found the larva did feed on *Erodium* in Germany, desired to breed it on *Helianthemum*. The late H. Doubleday sent him larvæ feeding on the plant. There was abundant proof from partially eaten leaves and frass that the larvæ during their journey had been eating the *Helianthemum* enclosed with them. On their arrival at Meseritz, Professor Zeller supplied them with fresh food. This they refused to eat, and actually died of starvation, rather than touch *Helianthemum* grown on a German soil. I have always regretted he did not try them with *Erodium*, for it seems to me a most inexplicable thing that these larvæ would not touch the German-grown *Helianthemum*.

After this long account, I must condense my remarks as much as possible. *Agestis* is double-brooded in England generally. In this northern district the

second brood is occasionally wanting. In Scotland, I believe, there is never more than one, and the form *Artaxerxes* is always produced, though the white spot varies much in size. Here (in Durham) we get all the forms, but it is only in the first brood that *Artaxerxes* is produced. It would appear therefore that only the larvæ that pass the winter can produce this form. We have imagined we got it with larger white spots when we had a severe winter, but I cannot say we made notes that would enable me to state this as a fact. Besides the ordinary varieties other forms occasionally occur. It is not unfrequent with a black disc spot in a white ring, and when the white spot is large in the fore-wings, there is often a trace of a white circle to the discoidal spot on the hind-wings. The late John Sang took one here with a distinct white spot on the posterior as well as the anterior wings. The orange lunules are sometimes large and distinct, sometimes wanting, with every possible intermediate form. On the underside the spots vary greatly. I have one without any but the discoidal spot. They also occasionally run into streaks, as they do in others of the genus. I have taken one of the variety *astiva*, which has the underside browner than usual.

Agestis, so far as I have seen, flies about the sides of banks rather than on level ground, and though the food-plant grows on dry places on the bank sides, the butterfly dearly loves a bit of damp or swampy ground. Wherever a little streamlet trickles down the hill, grown up with rushes and long grass, there we will find *Agestis* sporting in the sun or settling on the rush stems. It is a pugnacious little fellow, and will brook no intruder in its own domain, driving off not only such species as *Alexis* and *Pamphilus*, but even larger species should they come near. When so engaged, it attacks fiercely, and then returns to its resting place. This *Vanessa*-like habit does not obtain at other times. It is on the wing as soon as the dew is off the grass, and continues to fly till between four and five in the afternoon, after which it may be picked off the stems, and is easily distinguished from others of the genus by the underside of the wings being much browner.

The larva feeds on the underside of the leaves, and may be found by tapping the plant gently, and then searching for it on the surface of the soil. We get at the same time and place the beautiful larva of *Procris geryon*, which feeds on the same plant.

It is no wonder that this insect has had a variety of names. Beside the named forms, the type has been called *Alexis*, *Agestis*, *Medon*, *Astrarche*, and *Idas*. Which of these has precedence is yet an undecided point. At present it would seem that Scopoli's name *Alexis* given in 1763, has the prior claim. Staudinger calls it *Astrarche*, Bergstrasser, 1779; Newman prefers *Medon*, Esper, 1777; Stainton uses *Agestis*, W.V., 1776, which was also

adopted by Stephens. Further back Haworth called it *Idas*, Lewin, by which name it was introduced to the British fauna in 1795. To settle the various claims is very difficult, but unless the insect be really the *Alexis* of Scopoli, I see no reason for altering the name we are so well used to. Esper did not give the name *Medon* himself but took it from Hufnagle, thus carrying that name back to 1766. Staudinger however, doubts whether Hufnagle's insect was really this species, but there is no doubt as to it being the *Medon* of Esper, and that gives *Medon* precedence over the name he adopts *Astrarche*. *Agestis* was given to it in 1776, by the authors of the "Vienna Catalogue," but in the catalogue only, and this name has been followed by Hubner, Ochseneimer, Godart, Freyer, and Gerrhard, as well as British authors. *Medon* has been used by Esper and Borkhausen, but no writer except Bergstrassen himself uses the name *Astrarche*, which it is now proposed to substitute for that by which it is generally known.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 6. 1887.—Dr. DAVID SHARP, M.B., F.Z.S., President, in the chair. Mr. Francis Galton, M.A., F.R.S., of 42, Rutland Gate, S.W.; Mr. John Henry Leech, B.A., F.L.S., of 10, Hyde Park Terrace, W.; and Mr. George S. Parkinson, of Percy Cross, Fulham, S.W., were elected Fellows.

Mr. Samuel Stevens exhibited specimens of *Arctia mendica*, collected in the county of Cork, in Ireland, by Mr. M'Dowall, of Manchester. The peculiarity of the Cork form of the species is that the majority of the males are as white as the female of the English form; and although smoky-coloured specimens occur, intermediate between the Irish and English forms, the typical black or English form appears to be unknown in Cork.

Mr. M'Lachlan exhibited a zinc box used by anglers for the purpose of keeping living flies in, which he thought might be adapted to practical entomological use in the field.

Mr. George T. Porritt exhibited a large number of specimens of *Hybernia progemmaria*, bred from moths collected at Huddersfield, last spring. All the females and a large proportion of the males were of the dark variety *fuscata*, which formerly was almost unknown in Yorkshire, but which now seemed likely to replace the paler and original type.

Mr. Jenner Weir and Lord Walsingham, both remarked that the number of melanic forms appeared to be on the increase in the North, and suggested explanations of the probable causes of such increase.

Mr. Gervase F. Mathew, R.N., exhibited several new species of Rhopalocera taken by him in the Solomon Islands during the visits to those Islands of H.M.S. 'Espiegle' in 1882 and 1883. Amongst the specimens exhibited were species of *Euplœa*, *Mycalesis*, *Messarus*, *Rhinopalpa*, *Cyrestis*, *Diadema*, *Parthenos*, *Lampides*, *Sithon*, *Pieris*, *Papilio*, &c.

Mr. E. B. Poulton exhibited a large and hairy lepidopterous larva—apparently of a *Bombyx*—brought from Celebes, by Dr. Hickson, and made remarks on the urticating properties of the hairs of the species, which were said by the natives to produce symptoms similar to those of erysipelas if the larva was handled.

Lord Walsingham, Mr. M'Lachlan, Dr. F. A. Dixey, Mr. Jenner Weir, Dr. Sharp, Mr. Slater, and Mr. Poulton took part in a discussion as to whether urtication was due to the mechanical action of the hairs in the skin, or to the presence of formic acid, or some other irritant poison, in some glands at the base of the hairs. There appeared to be no doubt that in some species the irritation caused by handling them was merely due to the mechanical action of the hairs.

Mr. P. Crowley exhibited a collection of Lepidoptera recently received from West Africa, including specimens of *Papilio Hachii*, and several new or undescribed species of *Mylothris*, *Diadema*, *Harma*, *Rhomaleosoma*, &c.

Mr. H. Goss reported the capture by Mr. G. D. Tait, at Oporto, in September last, of a specimen of *Anosia plexippus*, and remarked that, although some twenty specimens had been caught in the South of England, only two specimens had been previously recorded from the Continent of Europe.

Lord Walsingham read a paper entitled "A Revision of the Genera *Acrolophus* (Poey) and *Anaphora* (Clem.); and he exhibited about twenty new species of these and allied genera. Mr. Stainton made some remarks on the genus *Anaphora*, and said he was glad Lord Walsingham was working at it and its allies. The paper was further discussed by Mr. M'Lachlan, Mr. Champion, and Dr. Sharp.

Mr. Poulton read "Notes in 1886 on Lepidopterous Larvæ, &c." In the discussion which ensued, Lord Walsingham referred at some length to instances of protective resemblance in larvæ, and alluded to the existence in certain species, especially of the genus *Melitæa*, of prothoracic glands. Further instances of protective resemblance were cited by Mr. Jenner Weir.

Dr. F. A. Dixey remarked on the extraordinary powers of contraction which appeared to be possessed by the retractor muscle of the flagellum in *D. vinula*, and enquired whether any corresponding peculiarities of minute structure had been observed in it. The discussion was continued by Mr. Gervase Mathew, Mr. W. White, Dr. Sharp, Mr. Porritt, and others.—H. Goss, *Hon. Sec.*

HAGGERSTON ENTOMOLOGICAL SOCIETY.

February 24th, 1887.—Mr. T. HUCKETT, Vice-President, in the chair. There was a very good attendance of members. Several members made donations to the Society's Library and Cabinet. Mr. Gurney exhibited living specimens of *N. hispidaria* females. Mr. J. A. Clark announced that he had bred eight *N. hispidaria*, during the week.

March 3rd. Mr. Gurney in the chair. Mr. Hanes exhibited two specimens of *P. unguicula*, bred this year. Mr. J. A. Clark opened the discussion on the life history and habits of *P. phleas*, illustrating his description by a very long and variable series of this species, he stated that he was indebted to Mr. Pearson for specimens of the female, which laid a few ova about the first week in August, they are laid in the joints of the leaves, singly or in pairs, and are of a basket shape. When the larvæ emerge, they differ from Buckler's description, they scarcely move, and feed on cuticle of the leaves of dock. After shedding the first coat they are yellow-green, after they have grown, they feed on the under-side of the leaf and after moulting are green, some being spotted and others with pink lines down the sides; this he considered was a very pretty larva, and in one or two cases they had shed their last coat before hybernation. The imago occurred nearly everywhere, he had even taken it in his own garden. Mr. Anderson thought that the members ought to be very much obliged to Mr. Clark for his description of this species, and concluded his remarks by saying that he thought the low scrubby plants were the best to obtain the larvæ from. Mr. Pearson said that the flight of *P. Phleas* was very erratic, he had taken some dusky forms at Finchley; last season he had worked the neighbourhood of Gravesend, and failed to see a single specimen. Several members then recorded localities where this species was in unusual abundance last season. Mr. Golthwaite, of Walthamstow, was proposed as a member.

March 10th. Mr. Cooke in the chair. There was a large attendance of members. Mr. Hanes exhibited a long and variable series of *H. leucophearia*. Mr. Pearson, a series of *P. phleas* and *L. agestis*. Mr. Cooke a very large and fine specimen of *C. viduaria*, and a specimen of *N. subrosea*. Mr. Hockett announced that he had just bred a specimen of *H. rupicaprararia*. Mr. Anderson on behalf of Mr. J. E. Robson (Hartlepool), read a very instructive and interesting paper on *Lycæna agestis*. Mr. Pearson said that the paper they had just heard read, was so very exhaustive that members could scarcely have anything further to add. He had taken this species at Box Hill, but found them rather difficult to obtain, and proposed that a cordial vote of thanks be given to Mr. Robson, for his able paper, which was seconded by

Mr. Hockett, and carried unanimously. Mr. Anderson thought that the members did not give that attention they should to the larvæ of these common butterflies, and hoped that during the coming season gentleman would try to obtain these, so as to get more information regarding the habits of the common species; several members spoke about the various names given to *L. agestis*, and thought it would be a pity to substitute any other name for this species than the one that is now so familiar. Mr. Harper stated that he had taken a specimen of *L. artaxerxes*, at Croydon, and another member had also taken a specimen, but he had not heard of any of the members having bred the species.

March 17th. Mr. Pearson in the chair. Mr. Lusby exhibited varieties of *L. corydon* and *L. alexis*, also specimens of *H. defoliaria*, *H. leucophearia*, *H. progemmaria*, and *A. æscularia*, taken two weeks previously. Mr. Gurney, a living larvæ of *C. ligniperda*. Mr. Clark a very fine series of *P. zetterstedtii*. Mr. Hanes announced that he had seen the wild strawberry in bloom a few days previously. Mr. Golthwaite brought on a very interesting discussion in reference to his having bred *N. hispidaria*, it appeared that some of the male specimens came out in the afternoon, and after having been in the breeding cage some considerable time, and showing no appearance of development, he placed them in a chip box, on looking at them the next morning, they were in the same condition, but he was very much surprised to find that on the evening of the second day after they had emerged, they were only just drying their wings. Mr. Pearson thought that the particulars furnished by Mr. Golthwaite, quite upset our ideas as to the development of lepidoptera. Mr. J. A. Clark said that he had on one occasion a specimen of *Hispidaria* develop in the same way, and went to state that in his opinion he should never have bred this species if he had dug the pupæ up, as they had all gone down in about eight inches of earth, and all in a bunch in the south-west corner of the cage.

March 24th. Mr. Hockett in the chair. Mr. Hanes exhibited species of North American lepidoptera. Mr. Gurney a long series of bred *N. hispidaria*. Mr. Pearson, various species of *Noctua* larva. Mr. J. A. Cooper announced that he had bred four or five specimens of *A. pictaria*. Mr. H. Blake was proposed a member of the society. Proposed by Mr. Pearson and seconded by Mr. Harper that the Secretary communicate with Mr. Robson, stating that the Society would feel obliged if he would kindly print the paper on *L. agestis*, in the *Young Naturalist*, this was carried unanimously.

April 7th, 1887. Mr. Hockett in the chair. Mr. Blake was duly elected a member. Mr. Hanes exhibited specimens of *D. coryli*, bred this year. Mr.

Pearson, living specimens of *C. vaccinii* and *T. stabilis*. Mr. Anderson, a series of *N. hispidaria*, and a living specimen of *H. abruptaria*. Mr. Harper, a fine series of *A. gemina*. Mr. Hanes announced having taken *C. flavicornis*, *B. parthenias*, and *T. instabilis*, on April 2nd.

April 14th. Mr. Anderson in the chair. Mr. Hanes exhibited a fine series of *C. flavicornis*, and a living specimen of *C. elpenor*. Mr. Lewcock, specimens of *T. lævigata*. Mr. J. A. Clark, bred specimens of *A. derivata*, bred same day. Mr. Lewcock, in company with another member paid a visit to Oxshott, but only found a few *G. typhæus* and *T. lævigata*. Mr. Pearson stated that in company with other members he paid a visit to Tilgate Forest and found *C. flavicornis* and *B. parthenias*, he had also paid a visit to the shallows in Epping Forest, in company with Mr. Anderson, and found the usual species such as *T. munda*, *T. cruda*, *T. stabilis*, *T. instabilis*, and *L. multistrigaria*. Mr. Anderson had paid a visit to Woking, and procured *B. parthenias*, *C. flavicornis*, and *C. psittacata*. The Secretary was also authorized to send to the *Young Naturalist*, a short notice of times of meetings, and the business to be transacted.—J. RUSSELL, Hon. Sec.

VARIATION IN TÆNIOCAMPA GOTHICA.

By C. S. GREGSON.

In the spring of 1885, my good friends, Mr. E. R. Curzon and Mr. G. Rose, sent me ova deposited by *T. gothica* var. *Gothicina*, which they had obtained from Perthshire, Scotland. From these eggs I bred a great number of *T. gothica*, all of them being beautiful ruddy large specimens, not the slightest approach to var. *Gothicina*, from which they were bred appeared amongst them. This, of course, cleared the way for further observation on variation, and gave me another opportunity to test the question—Do fugitive species throw back to the grandmother or grandparents? From these large ruddy specimens I obtained ova in the spring of 1886, and this present month (April, 1887), I have bred 101 magnificent specimens of perfect moths from the larva I fed up. Five are var. *Gothicina*, as defined in Robson and Gardners new list, that is, “without the black mark between the stigmata”; one-half of the balance are dark greyish large, but ordinary forms of *Gothica*, whilst the remainder are all of the beautiful ruddy colour, of all the var. *Gothicina* which I possess or ever saw, but have the dark space between the stigmata well pronounced, in my cabinet the variation of *T. gothica* is pretty well illustrated by over thirty specimens, the four first specimens are cinereous

light grey, the following seven are ruddy, like those described above, the next seven vars. from very dark well marked specimens, to almost *Gothicina* form, followed by seven vars. *Gothicina*, some of these have no indication of stigmata or of the usual "Hebrew character," the row being finished by seven specimens all varying from each other, one being quite as dark as the darkest form of *T. instabilis* or *T. opima* I ever saw, yet still the Hebrew character is well pronounced in all of them. In the seven *Gothicina* var. named above no two are alike, and one only approaches the form of the five recently bred, it will thus be seen how difficult it is to say what is *Gothicina*, except we adopt the canon laid down in Robson's new list "without the black marking between the stigmata," but the fact that five per cent of the bred specimens have thrown back to the grandmother, and that one half of the balance being dark well pronounced grey drabs, seems to point to drab grandfather, of course is not proved, but in the first case I think we may fairly say it has been shown that fugitive species have thrown back to the grandmother.

Liverpool, April 22nd, 1887.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

(Continued from page 69.)

Blaps similis. This species is broader, with shorter legs, and more distinctly punctured, it occurs in houses and bakehouses, in the South of England.

Blaps sulcata is a very large species, one of which I obtained at Ashton-under-Lyne; it was found in Egyptian cotton, in which it had probably been imported from Egypt, it was living when I received it. According to Fabricius the women in Egypt eat this species, which is cooked in butter in order to make them grow fat, it is very common in that country.

Tribolium ferrugineum is often found in bran and flour, on which the larva feeds. It has also been found in profusion in cotton goods, doing great damage, probably in consequence of the goods being heavily sized with flour.

Tribolium confusum is often found in bran and flour, in bakehouses and provender stores.

Gnathocerus cornutus is common in bakehouses, cornmills and granaries, the larva feeds on flour, meal, &c.

Hypophloeus depressus is found in cornmills, bakehouses, &c., in London and Liverpool.

Alphitobius diaperinus occurs in flour warehouses.

Alphitobius piceus occurs in bakehouses and granaries, where the larva feed on corn and flour.

Tenebrio obscurus. The larva is one of the meal worms, which is said to feed on sound flour; they occur in bakehouses and flour warehouses, in London, Paisley, Carlisle, and Manchester.

Tenebrio molitor. The larva is the common meal worm, which are sold and bred by bird fanciers. It frequents bakehouses, flour warehouses, corn mills, granaries, devouring flour, meal, and bran. It is also destructive to books, my son brought me a larva which he found eating galleries quite through them. They also destroy ship biscuit, by feeding and breeding in them. Insectivorous birds are fond of the larva.

Heteromera. I have found larva of a beetle of the Family Tenebrionidæ, feeding in liquorice roots, from which I have reared the perfect insects. At present the name of the species is not known.

Calandra granaria the corn weevil), is the most destructive of the British Curculionidæ, or the beetles which have a rostrum on the beak. It attacks stored-up grains of wheat and barley; the female deposits an egg in each grain, the interior of which is entirely consumed by the larva, sometimes the whole of the corn. In some of our corn stores is a complete living mass of these insects, thousands of sacks having in consequence to be thrown away. I don't think it is wise to store grain too long, as it is almost certain to be attacked with weevils. This species also feeds on biscuits. Tar is said to prevent weevils from entering or remaining in granaries.

Calandra oryzae (the rice weevil), is a very destructive insect, the larva feeds in rice, maize, wheat, and biscuits. It is common in grocery establishments, corn stores and mills, &c. Its habits are similar to the preceding species. It is very common in ship biscuits. I have been informed that sailors very often steep their biscuits in hot coffee to kill the weevils.

Xyleborus saxeseni is a small beetle which infest the oak in the South of England. This species has recently been found feeding in the staves of beer barrels en route to India; on arriving at their destination a great quantity of the beer had escaped, in consequence of the barrels being bored by these insects.

Bruchus pisi (the pea weevil). The perfect insects are found on the plants during the period of flowering. The larva feed in the interior of the

peas, in which they undergo their transformation, when it makes its escape by gnawing a hole in the pea, the larva having previously eaten its way almost to the surface; the beetles remain in the peas until the following season. This species is rare in Britain as a native. It is imported in peas in large numbers into this country. It is sometimes so abundant in some parts of North America as to totally destroy the crops of peas.

Bruchus pectinicornis feeds in beans, in granaries, corn stores, &c. This species I obtained in Manchester about thirty years ago, from Mr. T. Kelsall, feeding on horse beans.

Bruchus rufimanus occur in beans. I have seen the perfect insects flying in abundance in a bean field at Castle Mill, and settling on the flowers, the larva feed on the interior of the beans, in which they pass their transformations. Egypt beans are frequently infested. If beans are put into water the infested ones will float. A friend of mine gave me a few beans, some of which he was eating. I split a few with a knife, when, to his astonishment, I found a few beetles in them. The beetles which feed in them are quite concealed in the interior, and my friend declined to eat any more.

Bruchus lentis. The larva feed and undergo their transformation in the interior of the lentils.

Hypothenemus eruditus is a very small insect. It was discovered by Mr. Westwood, feeding in profusion in the cover of a book (whence the name) over fifty years since. It was found a few years ago, in the cracks of the bark of trees at Hawaii, an Island in South Pacific, by the Rev. Thomas Blackburn. This insect is only two-fifths of a line in length, in consequence of it only having been found in the cover of a book, and that so long ago, it has been erased from the British list.

Acanthia lectularia, the bed-bug belongs to the order Hemiptera, or half-wings. It is apterous or destitute of wings, it has very slight rudiments of wings, or hemilytra. It has been asserted that this species sometimes acquires wings. It has a kind of rostrum, from which three rigid, pointed setæ, can be protruded, which when united form a sucker, resembling a sting; it is adapted for extracting fluid. It is nocturnal in its habits, only coming out of concealment at night, when it uses its sucker for extracting blood from mankind. It emits a disagreeable odour, similar to many other species which live on plants. It is often asserted that this species did not exist in England, previous to the great fire of London in 1666; and that it was imported in timber into London from America. This insect is mentioned by Dioscorides, who was contemporaneous with Nero, A.D. 54—68.

Reduvius personatus, (the wheel-bug) is common in outhouses, the larva and pupa conceal themselves under dust, which they carry about on their backs, the odour of this insect is very disagreeable.

Musca vomitaria. The blue-bottle or blow-fly belongs to the order of Diptera, or two-winged flies. Its proboscis is retractile, which it can protrude at pleasure, at the tip there are two large oval suckers or lips. The mouth is adapted for extracting and transmitting fluid, it makes a loud humming noise when flying, by which it betrays itself as it enters our dwellings. The female deposits her ova on meat, carrion, and in such species of *Arum* as emits a cadaverous odour. All the species of this genus are scavengers. Nature has specially adapted them for the purpose of removing all putrid matter from the surface of the earth. The larva feed in meat, carrion, &c. It is the well known maggot or bait of the angler.

Musca domestica. The common house-fly is one of nature's scavengers, the larva feed in decaying animal and vegetable matter. Since our cesspools in Manchester has been emptied, and the putrid matter removed once a week, these insects are not so abundant as they were previously, when it remained for months; that allowed them time to pass their transformations and make their way into the houses, where they are very troublesome. I have some suspicion that they are the means of conveying the germs of disease. I accidentally knocked the skin off one of my knuckles, which, as usual, I took no notice of, shortly afterwards I fell asleep and was awoken by a fly which had settled on the wound, and had probably conveyed the virus of disease from putrid matter, it was many months before it healed.

Piophilæ casei (the cheese fly). The larva feed in the cheese. Whether to look on this insect as destructive or beneficial is a matter of opinion, however, as some people consider it to be the richness of the cheese which produce maggots, they are welcome to my share. Farmers generally exclude this insect as far as possible from the cheese room, the cheese factors objecting to buy living cheese, except at a very low rate, and when the cheese arrives in the warehouse, they endeavour to persuade their customers it is the richness of it which has brought it to life. This insect deposits its ova in cheese, where the larva feed.

Piophilæ atrata (?), the bacon fly. The female deposits her ova in bacon, hams, &c. Their larva feed in the interior, and when full-fed drop out and assume the pupa state, in the earth, or in the crevices of the floor, where they undergo their transformation.

PUBLICATIONS RECEIVED.

Abstract of Proceedings of the South London Entomological and Natural History Society, for the year 1886, together with the President's Address.

This Society again presents us with a lengthy and well got up report, showing considerable progress. That of last year was of 50 pages, this extends to 83. The 55 members of last report have increased to 101, and the cash in hand has grown to £12 18s. 5d. The greater part of this volume is occupied with a reprint of the abstract of proceedings, which has already appeared in the various entomological magazines. The address of R. Adkin, Esq., the President, is an interesting resume, not only of the Society's work, but of what has been done generally during the year, additions to the British Fauna, new works in Natural History, notices of distinguished Naturalists who have died during the year, &c., &c. Five excursions were again held, the Annual Exhibition appears to have been still more successful than the previous one. Mr. Adkin regrets that more papers have not been read at the meetings, only three having been submitted. We would suggest to the Society, whether it would not be better to print the more valuable papers that are read, rather than the account of the meetings, which have already appeared in the Magazines. Possibly this course might induce more of the members to prepare papers. It sometimes entails considerable labour to write a suitable paper, and if it is only read once before a very limited audience, the result scarcely seems to repay the author.

A plate accompanies the pamphlet, containing figures of four vars. of Lepidoptera, seven Ichneumons, two of the larva of *Smaragdaria*, and one of the pupa of *Exulans*.

The "Transactions" is sold to non-members for 1/6 and can be had from the Hon. Sec., Mr. Barker, to whom we believe much of the success of the Society is due.

 NOTES AND OBSERVATIONS.

TENIOCAMPA OPIMA THREE YEARS IN PUPA.—The only live moth I have seen this year was a very pretty specimen of *Teniocampa opima*, which came out in an old cage where I had reared that species *three years* ago! It has a very distinct band across the wings.—FRANCES I. BATTERSBY, Cromlyn, Rathowen, Ireland.

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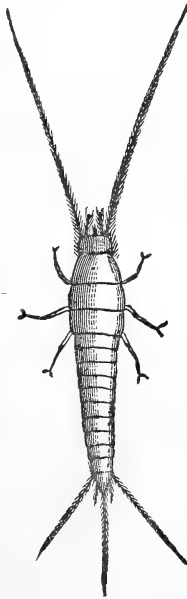
LEPISMA SACCHARINA.

Linn.

BY G. C. BIGNELL, F.E.S.

FISH-MOTH. SILVER-FISH. SILVER-TAIL, &c.

A FEW words of warning may not be out of place relative to this destructive little creature. In the December number of *The Canadian Entomologist*, Dr. Hagen has a long chatty paper; in it he has brought together many records of its destructive habits. The earliest notice mentioned by him is R. Hooke's "Micrographia," London, 1665, printed at the expense of the Royal Society, in which it is called a book-worm, from its habit of eating holes through leaves and covers



Magnified 8 times.

of books. Numerous records of its destroying silk garments, tapestry, and muslin curtains, in addition to books and their bindings, plainly show how necessary it is to be on the watch for this destructive little creature. I can speak from sad experience of its destructive habits among the books in my office (which fortunately, is away from my house), for whenever the books are allowed to rest undisturbed for some months there these little creatures will be found, and on removing the books traces

of their destruction will be very quickly seen. There is no doubt but that *L. saccharina* will destroy anything that has been starched, particularly so when these things are permitted to accumulate in some damp cupboard or box; labels in museums, mounted photographs and engravings, paper

on walls, are all attacked by this little creature. Fortunately, there is only one species known in England, this is said to have been imported from America, where Dr. Hagen says they have "half-a-dozen species." I trust that none of the other five species will ever be found in England, and that their loyalty to the land of the free will be a sufficient excuse for their remaining at home. *L. saccharina* is of a silvery grey colour, and is about one-third of an inch in length. The eyes are in two clusters of twelve in each, and at the sides of the head, very near the thorax. It would be a wonder if we had not got *Saccharina* seeing that it is such a cosmopolitan, for its destructiveness has been recorded not only from the chief cities of Europe, but also from India, Australia, and Jamaica.

We have, however, two very closely allied species, these we may consider as friends, seeing they feed on decaying vegetable matter—one inland and the other on the sea-shore. The former (*Machilis polyoda*), is very common in the woods and old lanes around Plymouth. I should like to know if it occurs plentifully in other counties; it is mottled-brown, and is commonly known by the name of "Spring-tail." The other is *Machilis maritima*, this species may be often seen running over the rocks close to high-water mark, in colour it is very much like the other, but with an addition of a slight tinge of olive-green; this species always carries its antennæ pointing forward, while *polyoda*, which is always running about in woods among the fallen leaves, &c. is, perforce, obliged to carry them over its back.

The scales of the three species are often used as test objects for high power of the microscope.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

(Continued from page 95.)

Pulex irritans, the common flea, is considered to be a wingless and aberrant form of *dipteron*. The female deposits about a dozen white and mixed eggs in a cluster, the larvæ have no feet and resemble little worms; they are very lively, rolling themselves into a circle or spirally, and crawl with a serpentine motion; they are said to feed in neglected beds, and in the crevices of bedroom floors, under carpets, &c. They are full-fed in about a fortnight, when they enclose themselves in a small silk cocoon, and in about twelve or fourteen days change to the perfect insect. If any person is

anxious to verify any of my remarks about *Pulex irritans*, I will direct him to what was an excellent locality, in a beautiful part of the country about a dozen miles from Manchester, from whence, although I was collecting insects, I was compelled to retreat after one night in a chaff bed. I can sympathize with Curran, on making his complaint in the morning to the woman of the house. "By heavens! madam," said he, "they were in such numbers, and seized upon my carcase with such ferocity, that if they had been unanimous, and pulled all one way, they must have pulled me out of bed entirely."

WOOD AND BARK-FEEDING INSECTS.

I will endeavour to point out the species of insects which feed on wood and bark, some of which are very destructive. The species to which I allude are mostly British. I will first deal with the Coleoptera or beetles.

Nemosoma elongata is a very elongated species. It feeds under the bark of old elm rails, where the bark is quite firm. Mr. Joseph Sidebotham met with this insect at Burton-on-Trent, and kindly supplied me with specimens.

Lucanus cervus (the stag beetle) is well known in the South of England. The larvæ feed on the solid wood of oak and willow, where they are very destructive; the perfect insect is on the wing towards evening. These insects are found in the day on the trunks of trees. The females seldom fly. The mandibles of the males are very largely developed; the head is very large, and the prothorax is short in proportion, which is generally the case in all animals with very large heads; they have short necks. These insects live but a short time in the perfect state: the larvæ are said to live from four to six years. The body of the larva is curved, so that it is compelled to lay on its side; when full-fed it forms a cocoon of chips and dust which it has knawed, in which it changes to pupa. The larva is said to be the *Cossus* of the Romans, which was eaten as a delicacy. I kept some of these insects alive for several weeks, which I received from the South of England, I forgot them a short time, and when I looked at them they had dismembered each other. The jaws were formerly used in medicine, under the name of the "Horns of Scarabæi," and according to Pliny, they were formerly suspended round the necks of children as amulets.

Dorcus parallelopipidus is a smaller species than the preceding, and the mandibles are not so fully developed. The larva feeds in decayed trees, especially ash, in the South of England.

Sinodendron cylindricum is one of the Lucanidæ. The male when fully developed has a stout horn on its head. Generally it feeds in decayed

ash, birch, alder, and maple, I also found one in poplar. The larva is curved and occurs frequently near Manchester and Llangollen. It is stated that Linnæus never saw this insect, although he believed such an insect existed.

The family of *LYMEXYLONIDÆ* is composed of some of the most remarkable Coleopterous insects discovered. The mandibles are short, thick, and obtusely bidentate; the body is linear, and of a moderately soft consistence; the antennæ are short; and the maxillary palpi of the males are furnished with very remarkable appendages, of which the use is unknown.

Of one species of this group, *Lymexylon navale*, a single specimen was captured by Mr. J. H. Griesbach, in Windsor Forest, on an oak tree in July, 1829, and in consequence of no more occurring for nearly fifty years, it was erased from the British list, as it was supposed to be an introduced specimen from the Continent of Europe. Although it is a very great pleasure to every student of nature to discover new species, I am in one way sorry to have to record it as a British insect. A few years since I found this dreadful pest in Dunham Park, at rest on the root end of a recently felled oak, within a few inches of the centre, which was cracked. It was a female, with the apical abdominal segments protruded and inserted into one of the cracks of the tree, thus serving the purpose of an ovipositor—it was probably depositing ova. It very much resembles a brown dipterous insect, for which I was very near mistaking it. However, I was too impatient or too eager to seize the prize, or perhaps I might have secured the ova. In the course of a few weeks I captured four other females within a few inches of where I found the first. The fifth specimen I gave to my valued friend Mr. Joseph Sidebotham.

During the next season, I found an oak tree which had been cut down, perforated with insects which I thought were probably *Lymexylon*. I communicated my opinion to Mr. J. Sidebotham, and we made arrangements to attack the tree with tomahawks. After cutting into the tree transversely about ten or twelve inches, we were rewarded by the discovery of a few of both sexes of the perfect insect and a few larvæ. As the season advanced, Mr. Sidebotham forwarded me a note stating that he had caught one with his hat, whilst it was flying. I have since taken this species freely, and worked out its history. The larva is very long and slender, with the first segment after the head dilated, and the terminal segment produced in a lobe, it is about an inch or one inch and a quarter in length. They bore holes from about one-twentieth to one-tenth of an inch in diameter, transversely into large oak trees in Dunham Park; and it is very probable that some of those giant oaks have had their existence terminated by this species. The perfect

insects may be seen on the wing on hot, sunny days, towering above the giant oaks, I should think about 100 feet high, perhaps higher than the beautiful Purple Emperor butterfly soars. Generally it is necessary to affix a net on the end of a long bamboo, and patiently wait until they descend to lower regions, to capture this insect. The pointed abdomen of this insect is a very suitable instrument for depositing its ova into cracks or crevices. This insect is very common in oak forests in the North of Europe. It is occasionally so abundant in the dockyards of France and Sweden, as to cause much damage. Linnæus, at the suggestion of the King of Sweden, having investigated and ascertained the real cause of the damage, suggested that the timber should be sunk under water at the time the perfect insect made its appearance, whereby it was secured against its attacks.

Hylecætus dermestoides is a species of Lymexylonidæ. This species was discovered in Sherwood Forest, by Mr. T. Desvignes, flying round one of the old birch trees, on which they alighted, and then ran quickly up and down the bark. This species is found in the larval state in birch trees, which it perforates similar to the preceding species. It also occurs at Rannoch.

Hedobia imperialis is one of the Anobiidæ. The larvæ feed in the wood of old whitethorn hedges, where the perfect insect may be obtained.

Dryophilus anobioides is found under the bark of broom, in spring, in the South of England.

Priobium castaneum much resembles the Death Watch, it is one of that group. The larva feeds in whitethorn in old hedges, near Manchester and Llangollen.

Anobium fulvicorne is also one of the Death Watch genus. The larva feeds in Ash at Llangollen.

Ptilinus pectinicornis. The larva feeds in oak and willow at Dunham.

Ochina hederæ. The larva feeds beneath the bark of the ivy, where it makes numerous galleries. Although it is scarcely possible for it to destroy the ivy, it certainly puts a check on the growth of old ivy, by cutting off the supply of sap. In Dunham Park there is an ivy infested with this species, which clings very tenaciously to life, although the old cedar on which it grows is dead and decayed long ago.

Bostrichus capucinus. The larva of this species feeds in decayed wood. I have often listened to the interesting accounts of the capture of this species in Broughton, by Mr. Thomas Hewitt, who was a well-known Salford Coleopterist. It is about 50 years since its occurrence in that locality, in a log of wood. It is also recorded as occurring in Norfolk, Derby-

shire, Nottinghamshire, and about twenty years since it turned up on a felled oak near London, thus showing how well this insect can conceal itself from observation.

Lictus canaliculatus makes burrows in the solid wood of recently felled oaks; it also attacks fresh oak palings, and oaks which have been damaged by lightning, or where the branches are rent off with wind.

Phlæotrya Stephensi. The larva feeds beneath the bark of old oaks in Dunham Park, and Stretford in a timber yard.

Hylobius abietis is very injurious to pine trees, especially the young trees. In Dunham Park some very large trees have been destroyed by the larva. It also feeds in larch, the larvæ are very common under the bark of diseased trees, probably they are the cause of the disease by cutting off the supply of sap. Recently felled trees or stumps, which are left standing, are soon infested with this insect. They may be found abundantly in heaps of pine twigs, or under chips, left by the wood-cutter. This species has often fallen on my neck when collecting in pine woods.

(To be continued.)

NOTES ON LEPIDOPTERA.

By B. LOCKYER.

(Concluded from page 79.)

A. NEBULOSA.—At sugar, and on trunks and palings. June and July. Hampstead, Highgate, and West Wickham Woods, and New Forest. Rather common; the larva commoner than the moth (end of April and beginning of May.)

HADENA PROTEA.—At sugar and on lamps. Woods and open heaths. Hampstead Heath, Bishop's Wood, Highgate Woods and New Forest. No rarity.

H. DENTINA.—Once at rest on "Bishop's Palings," between Shirley and Addington; end of May.

H. CHENOPODII.—At sugar, light, on palings, by mothing, and on flowers of thistle. May to July. Waste places, rank pastures, and gardens all about London, and at Southend, Essex. Common. The larva especially abundant about Tufnel Park, London, when the brickfields were overgrown with *Atriplex* and *Chenopodium*. From July to beginning of October.

H. ATRIPLEXIS.—Once at sugar. Bishop's Wood, Hampstead. June.

H. OLERACEA.—The same remarks apply as those under *H. Chenopodium*; but it may also be captured in woods at sugar (Southwood, Highgate) and Park Ground Inclosure, Lyndhurst.

H. PISI.—The larva abundant on Hampstead Heath, in the Autumn; and rare on the banks of the Wye, near Chepstow.

H. THALASSINA.—Not common. June and July. At sugar. Southwood, Highgate, and Denny Woods, New Forest.

H. CONTIGUA.—At sugar. Not very common. Denny Wood and Furzy Lawn Inclosure, New Forest.

H. GENISTÆ.—Scarce at rest. (The Ballards), West Wickham, on trees and palings. May.

XYLOCAMPA LITHORHIZA.—At rest on trunks of trees and palings at some height from the ground. March and April. Laues, fir and oak plantations about Shirley, West Wickham, and Surrey, (common) and rare in the New Forest.

CALOCAMPA EXOLETA.—A few at sugar, March, 1875. New Forest. At ivy, Hampton Court. September.

XYLINA RHIZOLITHA.—At rest on trunks and at sugar. Autumn and Spring. Common. Hurst Hill Inclosure, Lyndhurst.

CUCULLIA CHAMOMILLA.—At rest on Bishop's Paling, near Shirley, just under the projecting ledge at the top. May.

C. UMBRATICA.—Once taken at rest near Highgate; also at Lyndhurst near the station on palings. July.

HELIOTHIS DIPSACEA.—Flying swiftly over heaths by day. New Forest. July.

ANARTA MYRTILLI.—At rest and flying at dusk over heath, Shirley, Surrey, and in the New Forest; also on the Moors at Whitby. Not very common.

ERASTRIA FUSCULA.—Beaten out of bramble by day. Park Hill Inclosure, Lyndhurst.

BREPHOS PARTHENIAS.—Male on the wing, female at rest on twigs among birch. West Wickham Wood, Surrey. March.

PLUSIA CHRYSITIS.—Once at light. Sevenoaks, Kent. August.

GONOPTERA LIBATRIX.—At sugar, light, and at rest about outhouses. Highgate (rare), Sevenoaks, Kent, and about Lyndhurst. August and September.

AMPHIPYRA PYRAMIDEA.—At sugar. Very abundant in the New Forest. One of the few insects that will come to sugar on a beech tree. July and August. Once took the larva at Highbeech, Epping.

A. TRAGOPOGONIS.—At sugar. Tufnell Park, Middlesex, and New Forest. Not rare. August.

MANIA TYPICA.—At sugar, light, and hovering over thistle, &c. in the evening. June and July. All about North London, especially waste places, gardens, and rank pastures, near Camden Town. Commoner as a larva than as a perfect insect; may be easily taken in some numbers in dead leaves of *Pyrus japonica* and other creepers, about March.

M. MAURA.—Scarce at sugar. New Forest. July and August.

CATOCALA NUPTA.—At sugar and at rest on fences about North London, especially on Hampstead Heath; rare in the Highgate and Hampstead Woods and at Darenth Wood, Kent. August and September.

C. PROMISSA.—At sugar. New Forest. End of July to middle of August.

C. SPONSA.—At sugar. New Forest. August and September.

EUCLIDIA MI.—Not very common. Flying by day. Kensal Green, Middlesex. The Germans, Addington, Surrey, Park Hill, and Stubby Copse Inclosures, New Forest. May.

E. GLYPHICA.—Not common on the wing by day. Park Hill and Stubby Copse Inclosures, New Forest. May.

PHYTOMETRA ÆNEA.—Kicked up by day. Not rare. Woods, &c. in the New Forest. May.

ADDITIONS.

ASPILATES STRIGILLARIA.—Common as a larva in April, on the heaths at Shirley and in the New Forest.

CLEORA LICHENARIA.—At rest on trunks of oak, near Minstead, New Forest. The larva in the New Forest and at Shirley, Surrey, and on the Bishop's fence in the early morning. August.

EUPITHECIA NANATA.—Common. Shirley Heath and in the New Forest. Disturbed by day. April.

AGROTIS SAUCIA.—At sugar and ivy bloom. Rare. Near Lyndhurst and at Hampton Court, Surrey. September. (B. Lockyer.)

EPHYRA PENDULARIA.—Once on the Bishop's Fence, Shirley. May.

E. OMICRONARIA.—Once near West Wickham, also in the New Forest. May.

TEPHROSIA CREPUSCULARIA ANE BIUNDULARIA.—At rest on palings and trees. Shirley, West Wickham, and Lyndhurst. Not rare. March to May.

A FORTNIGHT'S COLLECTING IN THE
NEW FOREST.

By F. E. PRESCOTT DECIE, B.A.

ON June 5th, 1886, we drove over from Bournemouth, by Christchurch and Holmsley, to the village of Lyndhurst, which is situated in the very heart of the New Forest, and is therefore admirably adapted to form the base of operations for an entomological campaign. The drive from Bournemouth is calculated to give a new comer an excellent idea of the variety of scenery, which forms the most striking feature of the Forest. At one time the road runs over heathery moor or ferny upland; at another it plunges into a thick wood of beech, fir, or oak, only to emerge once more in an open glade, or a stretch of well-wooded park-like fields. The road itself is, unfortunately, by no means a good one, ruts and holes are at times unpleasantly numerous, and the joltings thereby produced are not at all conducive to a proper appreciation of the beauties of the surrounding country.

We arrived at Lyndhurst on a Saturday afternoon, without having secured lodgings beforehand, and knowing nothing of the place, had, consequently, some little difficulty in finding rooms. In the end, however, we found capital quarters, and a most obliging landlady.

We did not go out again that day, but in the course of the evening five *E. vulgata* and *E. castigata* came to light.

The following day being Sunday, our researches were confined to a short walk in the afternoon, taken with a view to gaining some idea of what we might expect to capture during our stay. We started along the Southampton road, and after crossing the upper part of the Beaulieu River, turned to the left across a strip of heather, which lies to the north of the road. Beyond this strip we found numerous pine, beech, and birch trees, and we walked on now under their shade, and now in the sunny glades (where a few *G. rhamni* were flying), until we reached a gate leading into Buckett's Lawn Enclosure.

For the benefit of those readers of the *Young Naturalist*, who are unacquainted with the New Forest, it may be mentioned that "enclosures" are young plantations, out of which it is thought necessary to keep the cattle and ponies, and which are therefore fenced. This particular enclosure consists of firs some fifteen or twenty feet high, a stream runs through the middle of it, and it is traversed by two or three rides.

We had expected to find Lepidoptera in greater profusion than we had ever seen them before, but were nevertheless astonished at the numbers, which were flying everywhere, more especially in the centre ride. *A. euphrosyne*

was there, and *G. rhamnii*, *C. pamphilus*, *H. tages*, *S. malvæ*, *P. phlæas*, and *P. atomaria*, while one specimen of *L. argiolus* was also seen. Here, too, we were delighted to see for the first time the lovely little *P. ænea*, flitting about the leaves and flowers of its food-plant, *Polygala vulgaris*, which was growing plentifully along the edges of the ride. These pretty little moths, like some butterflies, fly only when the sun is shining, and if it should pass behind a cloud for a moment only, not one of them is to be seen.

Passing out at the further end of the enclosure, we returned home round its western side. Here we saw but few insects, and the only thing that attracted our attention was a colony of digging bees. "Solitary" bees I had almost said, and this would have been to a certain extent true, for though there were many scores of them digging in a space a few feet square, each was excavating an entirely separate hole. We saw very few Diptera all the afternoon, though the sun certainly seemed warm enough to have brought them out. Birds too, did not appear to be at all plentiful, either in the enclosure or among the larger trees. Indeed the small number of birds in the forest was one of its most noticeable feature, and we could not help thinking that had they only been as numerous as in West Worcestershire, the ranks of the Lepidoptera would soon have been thinned.

In the evening one *E. vulgata*, one *P. punctulata*, and two *A. lubricipeda* were taken trying to immolate themselves in the candles.

Monday, the 7th, was a lovely day, and not too hot for walking, though the sun shone continuously, except between one and two o'clock. We started off soon after breakfast, provided with nets, an old umbrella for beating purposes, a portfolio for carrying plants, and a plentiful supply of chip-boxes, hoping to do a good day's work. We walked first over Lyndhurst Hill, and the crossing Hightand Water, and keeping along the road which passes between Holidayshill and Holmshill enclosures, went past Bolderwood grounds and farm to Bolderwood Green. This is a spot well worth a visit, for the view which may be obtained from it is one of the finest in the Forest, including many miles of heather and wood.

On our way we passed over some heathy ground, where *F. atomaria* was flying in abundance. By beating fir trees near Hightand Water, we obtained five imagines of *F. piniaria*, besides several larvæ of *T. piniperda*. Single specimens of the following were also taken in the course of the day:—*A. mendica*, *V. maculata*, *E. trilinearia*, *C. temerata*, *L. pectinataria*, and *T. lactearia*. Diptera were somewhat scarce, but specimens of *Syrphus bifasciatus* and *Hippobosca equina* were captured, and a number of *Hilara maura* and *interstincta* with a few *Cyrtoma nigra* were taken flying over a small pond in the heather. *Hippobosca equina*, the celebrated New Forest fly, is very fond

of running about over horses, holding on to their hairs with its crooked claws. The forest ponies seem to take little or no notice of it, but it is said to drive horses unaccustomed to its presence perfectly frantic.

In a hole in the high bank of a stream we found a Marsh Tit's nest containing young birds. Such a position is, we believe, a somewhat unusual one for a Marsh-tit's nest, but there was no doubt as to the species, for we had an excellent opportunity of observing the parent birds.

From Bolderwood Green we drove home by Mark Ash and the Christchurch road, visiting the Knightwood oak on the way. This oak is generally considered one of the finest in the forest, its girth at 5ft. from the ground being 19ft. 4ins. In spite, however, of its great girth and of its wide spreading branches, it cannot be said to be a good type of tree, for it was evidently pollarded in its early days and the main trunk is consequently quite short. On the whole we were more struck by the magnificent beech trees growing in Mark Ash, than with the Knightwood oak itself.

In the evening, we went sugaring among the big trees on the near side of Buckett's Lawn Enclosure. While we were waiting for darkness to come on we noticed *E. palumbaria* flying in some numbers. We also heard numerous nightjars and saw one or two woodcocks. At sugar *T. batis* and *G. libatrix* were most plentiful. Single specimens of *A. lubricipeda* and *E. trilinearia*, and two of *G. trilinea* were captured; while amid great excitement a fine *C. elpenor* was successfully netted.

The next day (the 8th.) was fine and warm, with a cool and gentle breeze, and we spent nearly the whole of it in Buckett's Lawn Enclosure. Here *F. atomaria* and *E. palumbaria* were flying in great profusion, and there were also a few *G. rhamnii* and *L. argiolus*. From the fir trees we beat some nice specimens of *F. piniaria* and two larvæ of *T. piniperda*, and by dint of great exertions we succeeded in capturing about a dozen imagines of *A. euphrosyne* and one *A. selene*. We took a capital series of *P. ænea* in the centre ride, and also netted a few specimens of *S. malvæ*, *V. maculata*, *T. lactearia*, *C. reclusa*, and *T. eatersaria*. Diptera were more numerous than they had been the day before, and we took *Dioctria atricapilla*, *Leptis scolopacea*, *Morellia hortorum*, *Musca corvina*, *Empis tessellata*, and *Syrphus bifasciatus*, as well as a good many other species, which we have not yet named. We found a dead adder in one of the rides, and also a live one, which wriggled off into the bushes on our approach. We afterwards discovered that there were great numbers of these reptiles in the forest, in fact more than was altogether pleasant. We also found in the afternoon two colonies of very large black ants, both of which were apparently engaged in making nests, for they were collecting and arranging heaps of dead leaves and fir spines. So energetically

were they labouring that the rustling of the leaves was distinctly audibly fully twenty yards from where they were at work.

In the evening we went sugaring, taking the same round that we had gone the previous evening, but met with only a small measure of success. After all this was not much to be wondered at, for the sky was clear and there was a half-moon; the air, moreover, was rather chilly. Our bad luck among the moths, however, in no way damped our spirits, for it was a lovely evening to be out in the forest, and the birds rewarded us for all our trouble. The hooting of the brown owls, and the weird cries of the screech owls were occasionally audible, while on all sides was heard the "burring" of the nightjars, at one moment sounding close at hand, the next far away in the distance. At frequent intervals, too, a woodcock would pass overhead, his long bill distinctly visible against the sky, uttering now and again his peculiar creaking note.

What strange birds the nightjars are! Their flight when hawking for moths has very little resemblance to that of any British bird: they flit unsteadily hither and thither, with wings turned upwards at quite an acute angle, and with a motion not unlike that of a Japanese paper bird-kite. The white spot underneath their wings, too, makes them appear in the dusk as though they had a round hole right through each wing. Their note, again, is like the corncrakes', almost impossible to localize; and, finally, they lay their eggs without making any pretence at a nest whatever. This curious habit may possibly be paralleled among the sea-birds, but among all the birds whose eggs we have found, there has been no single species (if we except those which utilize nests made by other birds) that has not made some attempt, however imperfect, to prepare a place for its eggs.

June 9th we spent in going over the Ordnance Survey Office, Southampton, and this day was consequently lost from a natural history point of view.

The morning after (the 10th) was warm, but overcast and drizzly, and by no means promising. However, it cleared somewhat later on, and we walked over Matley Heath, across the upper part of Matley Bay, and up to the top of the hill on the other side. It was still early in the afternoon when we reached the top of the bank, but a very heavy black cloud in the north seemed to promise a severe thunderstorm, and we made for home at once, having netted, besides a lovely pale yellow variety of *F. atomaria*, only a few common insects. We had taken several larvæ, but none of them were recognized except one *B. parthenias*, beaten from birch; one *C. elinguarina*, found upon bramble; and one *T. piniperda*, beaten from spruce fir.

The only really noteworthy incident of the day was the finding of two night-jars' nests, among the young firs in the enclosure which lies between

the Beaulieu road and Matley Bog. I use the word "nests" for want of a better, but, as before remarked, the night-jars make no real nest at all. They merely deposit their eggs on some beaten down piece of dry fern, among the young fir trees. There were two eggs in the first instance, one of which we took. The bird sat very close, and when disturbed only fluttered off a short distance into the fern, returning with great boldness as soon as we had got a few yards from her nest. In the second case there was only one egg, and consequently the bird was not sitting.

In Matley Bog we noticed the Bog Bean (*Menyanthes trifoliata*), and the Alder Buckthorn (*Rhamnus frangula*), growing very plentifully.

In the evening we sugared some of the large trees along the Beaulieu River to the south of the Southampton Road, but met with wretched luck, securing only five specimens, and those common ones. We met another entomologist who also complained bitterly of the evening.

The 11th was a detestable day, chill and drizzly, with a strong and by no means warm south wind. In spite of the wet we went for a walk past Wilverly House, through Gritnom Wood, and into Hurst Hill enclosure, but we might just as well have stayed at home, for we made no captures worth mentioning all day. We found a wren's nest with a quantity of eggs, in Gritnom Wood, and saw several green woodpeckers in the same place.

The morning of the 12th, though an improvement on the day before, was by no means so favourable as it might have been, for the sky was cloudy and a strong south-west wind was blowing. About 12 o'clock we started along the Beaulieu Road, intending to explore Denny Bog. On arriving at Matley Passage, we turned off to the right, and beat a few larvæ (unknown to us) from the willows which grew by the little stream. Then crossing the road we went down the stream for 60 or 70 yards, taking a number of Diptera and one *J. marginata* among the rushes. We also took from the stream specimens of *Ranunculus peltatus* and *Apium inundatum* for preservation. A number of green plover were flying about the edge of the Bog. A short distance further on, whilst making our way up a steep bank thickly covered with heather, we noticed several *A. myrtilli* darting about in the bright sunshine, and we were soon engaged in trying to net some of these lovely little moths. In this, however, partly owing to their rapid, jerky flight, and small size, and partly to the roughness of the ground and the length of the heather, we were quite unsuccessful, and the sun being obscured after a few minutes the moths at once vanished, and we, feeling somewhat disgusted at our want of skill, sat down and endeavoured to console ourselves with sandwiches.

On resuming our walk we turned off to the right of the road through a sand-pit (in which we took two *P. megæra*), and soon found ourselves in a

region of large trees and fern, with here and there a wide opening or a green cart track. Here *C. pamphilus* was very numerous, while the ubiquitous *F. atomaria* was occasionally seen drifting before the wind, presumably blown away from the heather in which it everywhere swarms. Here, too, we took one *C. exanthemaria* and one *Morellia hortorum*, and found a larva of *A. prodromaria* on the trunk of an oak.

Leaving the fern and the trees we then crossed a piece of heathery ground, and presently came upon the outskirts of Denny Bog. This bog we afterwards found to be of considerable extent, but on the present occasion we saw only a small outlying portion of it. As we neared the spot two herons and nine wild ducks rose in front of us. In the marshy ground we found growing *Orchis latifolia*; the bog myrtle (*Myrica gale*), and large quantities of a common cotton grass (*Eriophorum angustifolium*.) While we were engaged in getting some specimens of *Orchis latifolia* for drying, we were joined by two botanists, who were extremely kind in giving us information about the plants of the neighbourhood, and who, moreover, presented us with a piece of the rare *Ludwigia palustris*, taken from a small pond a few miles away. We walked back to Lyndhurst with them, and a heavy storm of rain coming on just as we reached home, we did nothing more that afternoon, though it was still early.

We sugared in the evening in Bucket's Lawn enclosure, but with little success; two *M. abjecta*, one *G. trilinea*, and one *R. tenebrosa*, being the only insects which we kept. The night was not favourable, for the air though still was damp and chilly, and there was a bright moon. We took two *M. subtristata* and two *S. pectinataria* flying at dusk, and saw the usual number of woodcocks and nightjars.

(To be continued.)

NOTE ON EUPITHECIÆ.

By C. S. GREGSON.

Irriguata.

Last season a friend entrusted to my care two pupa of this species, and I watched them like a cat would a mouse. They were kept out of doors exposed fully to all sorts of weather, being covered with snow for two weeks. No change in the colour of the pupa took place until the middle of April; on the 16th May they were quite dark, and on the 17th the first appeared, and two days afterwards the second emerged. I arrived at the conclusion that the reason *E. irriguata* is so scarce in collections is that it is over and

only stragglers remaining before the cheap-trip collectors go to the New Forest for a week or two. That somebody knows all about it and nurses it I have little doubt, but if the practical collectors around London will go down to the New Forest as soon as they get this notice, and beat for it, search tree (oak) trunks, and moth for it at dusk, I feel sure it will be no longer scarce in our cabinets. Most specimens taken will be females, possibly such as come out too late to find males, but it is quite possible some will have found late males and will deposit fertile eggs, if so, perhaps they will record the fact in the *Young Naturalist*.

Venosata var. Fumosæ and var. Bandanæ.

I am now breeding this magnificent variety freely. I say "magnificent variety," because, though when I bred it before, I did not breed so many or such distinctly marked specimens. Now I am breeding series of it every day, some like my var. *Fumosæ*—dark, dun, uni-coloured specimens—whilst many others are so distinctly striated and banded, that few people would suspect them of being only varieties of a light reticulate (type) species. I can only describe them as size $\frac{7}{8}$ of an inch; colour dark rich mouse-coloured dun, having two white striæ edged with black, and a dark line in the centre of each white stria, inside these striæ the colour is much darker and forms a wide irregular brown dun coloured band, very like some of the genus *Emmlesia* have. As this variety is so pronounced, the name *fumosæ* hardly does it justice, I therefore propose to call it *V. bandanæ*.

OBITUARY.

THE REV. JOHN HELLINS.

We very much regret to have to announce the death of the Rev. J. Hellins, which took place at his residence, The Close, Exeter, on the 9th May. On Saturday he was taken ill with an affection of the throat, which, unfortunately, terminated fatally on the Monday morning following. He was so highly respected and esteemed in the City of Exeter, that the sad event was made known during the day by the tolling of the Cathedral bell.

The very able and painstaking manner in which he carried out his investigations as an entomologist will be long remembered by his numerous circle of friends, in proof of which we have only to look on the two last volumes of the Ray Society's publications, he having taken upon himself to complete the histories, as far as possible, that were omitted by his co-worker the late Mr. Buckler.

He was educated at All Saint's College, Oxford, taking his degree of B.A. in 1851 and M.A. in 1857. In 1852 he was ordained Deacon, and in 1854 Priest, by the Bishop of Exeter. For over 20 years he was Chaplain to the Devon County Prison, from which he retired about 7 years since in consequence of ill health. For the past few years, feeling himself restored in health, he has taken several honorary duties, such as Chaplain to the West of England Deaf and Dumb Institution, Boys' Reformatory, &c.

His loss will be severely felt, not only by the entomological world, but to many poor people in the city. As a friend of many years standing, the writer feels it very much, for during the summer months he was almost a daily correspondent.—G.E.B.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 4th, 1887.—Dr. D. SHARP, F.Z.S., President in the chair.

The Rev. C. Ellis-Stevens, B.D., of Brooklyn, New York, U.S.A.; Mr. Frederic Merrifield, of 24, Vernon Terrace, Brighton; Mr. Henry Rowland Brown, B.A., of Oxhey Grove, Stanmore; and Mr. Coryndon Matthews, of Ivybridge, Devon, were elected Fellows.

Mr. Wm. Warren exhibited specimens of *Stigmonota pallifrontana*, *S. internana*, *Asthenia pygmaea*, and *A. abiegana* (*subsequana*, Haw.)

Mr. Stainton remarked that the two last-named species, *Asthenia pygmaea* and *A. abiegana*, both had white underwings, and were in other respects very similar. It was formerly thought that Haworth's *subsequana* was identical with the species previously figured by Hübner as *pygmaea*; but now that the two allied species were critically examined it appeared that the species described by Haworth as *subsequana* was not Hübner's *pygmaea*, but another species known as the *abiegana* of Duponchel, dating only from 1842, so that Haworth's name *subsequana* had priority by thirty years.

Mr. F. Pascoe exhibited a specimen of *Diarneis Taylora*, (Wath.), taken out of the stem of an orchid—*Saccolabium caeleste*—growing in an orchid-house at Croydon, and received from Moulmein, in Burmah.

Mr. M'Lachlan exhibited nearly 200 specimens of Neuroptera, in beautiful condition, collected by Mr. E. Meyrick in various parts of Australia and Tasmania, comprising about seventy species. There were between forty and fifty species of Trichoptera, including moth-like forms from Western Australia, allied to *Plectrotarsus*, Kol.; and other species belonging to a group re-

presented by *Hydropsyche Edwardsii* (M'Lach.) Among the Planipennia the most remarkable insect was a new species of the singular genus *Psychopsis* (Newm.), from Mount Kosciusko, where it was common. Of Pseudo-Neuroptera, there was a species of *Embiidæ* from Western Australia, and certain curious *Psocidæ* and *Pertidæ*. The Trichoptera appeared to be exclusively confined to *Sericostomatidæ*, *Leptoceridæ*, and *Hydropsychidæ*. Mr. Meyrick made some remarks on the localities in which he had collected the species.

Mr. M. Jacoby exhibited three new species of *Xenarthra*, collected by Mr. G. Lewis in Ceylon; also a species of *Loxoprosopus* from Brazil.

Mr. C. O. Waterhouse exhibited a living example of an Ichneumon—*Ophion macrurum*—bred from a larva of *Callosomia promethea*, a North American species of *Saturnidæ*. He also exhibited a number of wings of Lepidoptera denuded of the scales, in order to show the neuration for study, and explained the method he had adopted for removing the scales. The wings were first dipped in spirit and then placed in *eau de javelle* (potassium hyperchlorite.) Mr. Waterhouse said he had substituted peroxide of hydrogen for *eau de javelle*, but the action was much less rapid, although the results were satisfactory.

Mr. Poulton observed that, although the pigment had disappeared, he thought the scales were not removed, but were merely rendered transparent; and he remarked that the discovery of some chemical for softening chitine had long been wanted to prepare specimens for the microscope. The discussion was continued by Mr. M'Lachlan and Dr. Sharp.

Mr. Slater read a note, extracted from the "Medical Press," on the subject of the poison used by certain tribes of African Bushmen in the preparation of their arrows. It was stated that a poison was prepared by them from the entrails of a caterpillar which they called "N'gwa."

The Rev. W. W. Fowler read a note received from Mr. J. Gardner, of Hartlepool, in which it was stated that *Dytiscus marginalis* possessed the power of making a loud buzzing noise like that of the humble bee.

Dr. Sharp said he was familiar with the humming of *Dytiscus marginalis* previous to flight, and thought it might perhaps be connected with an inflation of the body for the purpose of diminishing the specific gravity of the insect; he had noticed also that it was occasionally accompanied by the discharge of fluid from the body.

Mr. Wm. White read a paper "On the occurrence of anomalous spots on Lepidopterous larvæ." A discussion ensued, in which Mr. Poulton, and others took part.

Mr. Waterhouse read "Descriptions of new genera and species of *Buprestidæ*."—H. Goss, *Hon. Sec.* .

HAGGERSTON ENTOMOLOGICAL SOCIETY.

April 21st.—Mr. Huckitt, Vice-president, in the chair. There was a large attendance of members, and a large number of exhibits, amongst which may be mentioned several bottles containing specimens of snakes from Basutoland, by Mr. Huckitt; Mr. Russell, a very fine series of *E. elpenor*, bred; Mr. Hanes, a long series of *B. parthenias*; Mr. Anderson, very fine specimens of *Abruptaria* and *O. pudibunda*, bred; Mr. J. A. Clark, a large number of bottles containing specimens of pond life, some being of great interest. Several members mentioned having seen *B. hirtaria* for the first time this season. Mr. Barker brought up a notice in reference to the enclosure of Box Hill, which stated that visitors to that place were to keep on the front of the hill, and not trespass in the wood at the rear.

April 28th.—Dr. Sequira, M.D. in the chair. Mr. Hanes exhibited captured specimens of *G. libatrix*, *T. batis*, and *C. corylata*; Mr. Pearson, *C. flavicornis*, *T. munda*, *B. parthenias*, *E. dodoneata*, &c.; Mr. J. Clark, a species of *Tipula*, bred from larvæ dredged from ponds (bred that day.) Mr. E. R. Sequira was proposed a member. Several members had paid visits to Epping Forest, but only found a few species such as *T. cruda*, *gothica*, &c.

May 5th.—Mr. Huckitt, Vice-president, in the chair. Mr. Anderson exhibited a long series of bred *H. abruptaria*; Mr. Hanes, fine series of *C. elpenor*; Mr. Pearson, series of *F. piniaria*; Mr. J. A. Clark, specimens of *X. lithoriza* bred that day. Several members had paid visits to West Wickham and had taken *T. piniperda*, *E. nanata*, and *F. atomaria*; on the Shirley Hills had taken larvæ of *S. belgiaria*, *A. agathina*, and *A. porphyrea*; and at Highgate Woods, the usual species of *Noctua* larvæ.

May 12th.—Mr. Huckitt in the chair. Mr. Lusby exhibited two specimens of *L. argiolus*, taken a few days previously, and said that this year they were rather scarce; Mr. Hanes, ova of *G. rhamni* on twigs of *Frangula*, also various species of *Noctua* larvæ; Mr. Anderson, larvæ of *Pamphilus*, taken in Epping Forest; Mr. J. A. Clark, fine series of *A. derivata*, bred.

May 12th.—Mr. Huckitt, Vice-president, in the chair. Dr. Sequira, M.D., exhibited a quantity of living specimens of *Sulphurella*, taken that day; Mr. Harper, a log of ebony which was perforated by an insect, the species being undetermined; Mr. Hanes, *X. lithoriza*, *T. piniperda*, *A. derivata*, and *E. nanata*; Mr. J. A. Clark, various specimens of pond life; Mr. Sauson, *A. prodromaria*, *T. instabilis*, *P. pilosaria*, and *A. derivata*. Mr. Clark announced that he had just bred a few specimens of *E. Curzonii*. Mr. A. Sauson was proposed as a member of the Society. Mr. Harper brought up the adjourned discussion on the habits of *L. ægera*. This was a species that he had never bred, but, according to Stainton, it had a brown larva, with a white stripe down

the back, which fed on vetch, is full-fed the end of May, and appears on the wing the middle of July; is always found in open spaces, it flies like the ordinary common species, and retires to rest earlier than others of the genus, resting on rushes and heather; he had formerly found them in Epping Forest, St. George's Hill, Weybridge, and abundantly in the New Forest, but considered that they had quite disappeared from Epping Forest, the nearest place to take them now being Weybridge. Mr. Hockett said that he had no doubt but that this species was extinct in Epping Forest, and said that he took them in marshy places. Mr. Harper stated that where he took them on St. George's Hill there was no marshy ground. Mr. Pearson had taken several about five or six years ago, but had only observed one specimen in the Forest since. Mr. J. A. Clark had also taken it in Epping Forest, also at Box Hill.—J. RUSSELL, Secretary.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

March 24th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Mr. J. A. Cooper exhibited a variety of *Cidaria immanata*, Haw., from North Devon. Mr. Cooper showed a specimen of an ichneumon bred from a pupa of *Sesia sphegiformis*, Fab. Mr. T. R. Billups exhibited *Stilpnus deplanatus*, Gr., bred from a larva case of a species of *Psyche*, found on a fence in his garden at Peckham, also *Apanteles tetricus*, Renh, bred from the Common Thrift (*Armeria maritima*, Auct.), found in the Warren, Folkstone; he stated that this rare species of Braconidæ had hitherto only been recorded from Devonshire.

April 14th, 1887.—The President in the chair. Mr. J. A. Cooper exhibited *Amphidasys prodromaria*, W.V. (*stataria*, Hufn.) Mr. C. A. Briggs, a large number of *Lycæna adonis*, W.V. (*bellargus*, Rott.), including many forms both of the male and the female, dwarfed forms and some remarkable forms of the underside; also another box containing a pale yellow form of *L. ægon*, W.V., and varieties of the underside of *L. alexis* (*icarus*, Rott.), and *agestis*, W.V. (*astrarche*, Bgstr.) Mr. Goldthwaite, living larvæ of *Pericallia syringaria*, L. Mr. R. Adkin, pupa case of *Eupæcilia umbiguella*, Hub., from the New Forest. Mr. T. R. Billups, fine specimens of the following Coleoptera: *Megalosoma typhon*, from Chili; *Xylotrupes gideon*, from the West Indies; *X. dichitonus*, from the Phillipine Isles; *Golofa centaurea*, from West Africa; *G. hastatus* from Mexico, and *G. alacus*, from Columbia; also three examples of the rare *Lamellicorn* (*Phœneus imperator*, Fab.), from Chili, and contributed some interesting remarks on his exhibit. The Secretary read a letter from Mr. W. F. de V. Kane, referring

of the capture by a friend of a sound-producing lepidopteron in the Gerakhpur Woods, India. Mr. T. D. Cockerall contributed a paper on "Variation," which was illustrated by a number of specimens of British Mollusca.—H. W. BARKER, Hon. Sec.

CLYDESDALE NATURALISTS' SOCIETY.

The usual monthly meeting of this society was held on Wednesday evening, 20th April, at 207, Bath Street, Mr. T. J. Henderson, President, in the chair. The following gentlemen were admitted as members:—(Honorary member) Mr. Nathaniel Dunlop, 76, Great Clyde Street; (corresponding member) Rev. A. B. Watson, Kurrachee, India; (ordinary members) Messrs. John Young, F.G.S., Hunterian Museum, University; Chris. Meadows and Robt. Meadows, 256, West George Street; and D. C. Glen, F.G.S., 14, Annfield Terrace. Mr. Robert Mason, F.L.S., exhibited a fine collection of plants from Norway, and for comparison showed specimens of the same species found in Scotland and other countries. He made some very interesting observations bearing on the similarity of the flora of Scotland and Norway, which is looked upon as an argument in favour of the theory that the two countries were at one time part of one Continent. Among other noteworthy specimens he showed *Cornus suecica*, *Trientalis europæa*, *Linnæa borealis*, *Andromeda polifolia*, and a great many others. Mr. J. M. Campbell exhibited legumes, or seed-pods of the sword bean, of a very large size, from Burmah; also living specimens of the garter snake (*T. ordinatus*), from Canada, regarding which he made some explanatory remarks. He also showed a very curious series of nests, ten in all, of the spotted fly-catcher, *Muscicapa grisola*, Linn, from Kirkcudbrightshire. The nests had been all built by one pair of birds, on a small shelf at the back of a rustic seat or arbour at Callyhouse, each nest being in itself complete, and all connected to each other, covering the complete length of the shelf. Five eggs were laid, one in No. 5 nest, one in No. 6, and three in No. 1, all of which were put together in one nest, and in due time safely hatched. The incident is considered by ornithologists to be a remarkable one, and they can offer no decisive explanation of the phenomenon, no similar instance of the kind being on record. This nest is now in Kelvingrove Museum. Mr. C. B. Cross and Mr. A. A. Dalglish exhibited interesting boxes of lepidoptera, containing, among others, several species of local lepidoptera taken during the present month. Mr. Robt. J. Bennett read a highly interesting paper on "The A B C of Bee-keeping as a hobby or for profit." In illustration of the subject the essayist showed large coloured diagrams, and several of the more interesting articles connected with bee-keeping. The paper will be published in the *Young Naturalist* next month.—JOHN MACKAY, Hon. Sec.

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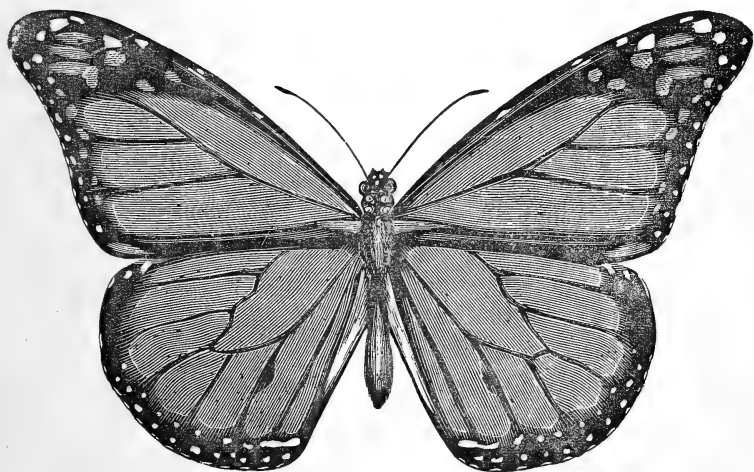
JULY, 1887.

VOL. 8.

ANOSIA PLEXIPPUS.

(*Danais Archippus.*)

BY JOHN E. ROBSON.



WHILST we have been deploring the fact that our British butterflies were decreasing in number of species, two new ones have unexpectedly been added to our list. *Lycæna argiades* has occurred in Dorsetshire, under circumstances rendering it probable that it is an old inhabitant, hitherto overlooked in consequence of its close resemblance, when on the wing, to the Common Blue, *Lycæna alexis*. This, however, cannot yet be decided, as the very few specimens hitherto taken may only have been "blown over," like the examples of *Lycæna bœtica* that have occurred.

The large and handsome species represented above, is an undoubted immigrant, and as the time is approaching when collectors should be on the look

out to see if it has succeeded in establishing itself on our shores, I have thought it well to give the above figure, and a few random remarks on the subject. The woodcut gives a very fair idea of the insect, the black portions of the figure being black, the shaded portions rich fulvous, and the few spots round the margin white. It is best known as *Danaïs archippus*, and is a native of the American Continent, where it is generally distributed and common. It is well known for possessing strong migratory proclivities, and has already accomplished the colonization of various lands far distant from its native home. In America it may be found from the Hudson Bay territory to the Amazon. It has spread from there, apparently within the last 20 or 25 years, across the entire Pacific Ocean, colonizing the various islands, and even reaching New Zealand, Australia, and the islands of the Malay Archipelago. An insect with such extraordinary powers of flight as this indicates will only be stayed in its career by one thing, food. Its natural food is one or other of the different species of *Asclepias*. The seed of one of these, *A. curvassavica*, is said to be "eminently fitted for wide dispersal, being very minute, and enveloped in a great quantity of light cottony down, and it is quite possible that they may have, in the first instance, been carried unobserved to the Sandwich Islands through the medium of commerce. Thus the first great gap of 2,350 miles in extent (measured from the nearest point of the American Continent), may have been bridged over by the plant." But it may also be that the larva will feed on other than *Asclepias*.

I often have butterflies and other insects brought me by seafaring friends, some of whom take the trouble to mark the latitude and longitude where the specimens were taken, or the distance from the nearest land. In the course of the last ten years several examples of this handsome butterfly have been so brought me, one being marked "600 miles from Cape Race, the nearest land." This specimen is in good condition, being only slightly rubbed in one place, probably by the fingers of the captor, unused to handling such fragile creatures. Mr. Mathew has often seen it "more than 200 miles from land. During a cruise between New Caledonia and the Solomon Islands, they were to be seen every day often in numbers." The ocean between the American Continent and our own shores is constantly traversed by vessels on which specimens could not only rest, but be helped with a free passage to their journey's end. Butterflies also are able to alight on the surface of the ocean and rise again (see *Young Naturalist*, Vol. II. page 29, and the Supplement—Dale's *British Butterflies*—to the current Volume, page 17). This much at any rate is certain, that the butterfly does cross the ocean. Nor need it be wondered at that any insect so strong and powerful on the wing can do so, for much feebler species have accomplished wonderfully

long journeys. I have in my collection two specimens of *Danais chrysippus*, a smaller and much less powerful insect, taken 300 miles at sea, but it has been seen 700 miles from land. This species has also occurred in Britain, and the larva was once found. A vast swarm of a still smaller and feebler butterfly (*Terias lisa*) has been known to fly 650 miles, from the American coast to Bermuda; and in the E.M.M. for June, 1885 (Vol. XXII, page 12), Mr. McLachlan records the occurrence of a swarm of *Deiopeia pulchella*, in the Atlantic, in Lat. $0^{\circ} 47' N.$, Lon. $32^{\circ} 50' W.$ This is 960 miles S.W. of the Southernmost of the Cape Verde Islands, whence they had probably flown, or been blown. *Pulchella* is not known as a South American species, and Mr. McLachlan suggests that it could not well cross the remaining 440 miles as they would then get caught in the S.E. trade winds and driven back. I have *pulchella* from the Mediterranean, marked "160 miles from land." *Pterippus* is an insect of very different powers of flight, and must be a very hardy species, if it can thrive where snow is on the ground for eight months of the year, as well as in the tropical regions of South America. It has been known to live fifteen months in the perfect state.

The first specimen that occurred in this country was taken at Neath, on 6th September, 1876, and is recorded in the E.M.M. for the following month (Vol. XIII, page 107), by Mr. John T. D. Llewellyn. A second was taken the same year at Hayward's Heath, Sussex. About the same time, but the actual date is not known, another was captured at Poole, by a coastguardsman. The following year one was taken in La Vendée, the first Continental example. Four years afterwards (1881), a fourth British specimen was taken at Snodland, Kent. No more are recorded for another four years, but in 1885, quite a dozen were captured in various places on the South coast. Last season it again appeared in the South of England. A second Continental specimen was taken at Gibraltar, on 24th October, 1886, was recorded in the E.M.M. (Vol. XXIII, page 162), and a third, taken at Oporto, was reported at the Entomological Society's meeting, on 6th April of this year (see Y.N., page 88). When enterprising human travellers accomplish any feat that had not been done before, they are speedily followed by a host of imitators, who find it easy to do after they have been shown the road. It would almost seem as if this insect were gifted with the power of enabling it to communicate its success to those left behind, and thus encourage them to try and try again. It is, at any rate, looking as if—though we have lost *Acis* and *Arion*, *Dispar*, and *Cratægi*—we are going to have this handsome species naturalized among us, perhaps its brother *Chrysippus* also. I may say with Dow Junior, "So mote it be."

Hartlepool.

A FORTNIGHT'S COLLECTING IN THE NEW FOREST.

By F. E. PRESCOTT DECIE, B.A.

(Continued from page 110.)

The following day (the 13th) was fine and sunny, but it was warm, as there was a strongish north-west wind blowing. In the afternoon we drove over to Stoney Cross to see Rufus' Stone. We went by way of the Kennels, Manor Park, and Robin's Bush Farm, and returned by Castle Malwood and Winstead. We saw two whinchats in the whins, on the bank above Rufus' Stone. Insects were very scarce indeed, and a few Diptera and Micro-lepidoptera were all we took. I ought not to forget to mention the rhododendrons, which grow in profusion in the Manor Park, and are really magnificent, reaching, as they do, a height of twenty feet or more, without being in the least straggly. The common sort only were properly in flower at this time, but there were some darker varieties, the blossoms on which were nearly over.

In the evening, two *A. lubricipeda* and two *E. vulgata* came in at the window to light.

The fact that we had been informed, on what we considered trustworthy authority, that *B. roboraria* might be taken at this season, at four o'clock in the morning, flying among the large oak trees on the outskirts of Little Holmshill Enclosure, led to our making a start on the 14th, at the unpleasantly early hour of 3.30 a.m. The morning was fine and bright, but it was very chilly before the sun rose. On starting, we made straight for our destination along the Beaulieu Road, and while on our way we were quite surprised at the number of rabbits, which were running in all directions over the heather. That there were rabbits about we were well aware, but we had no idea there were so many. Whether *B. roboraria* does or does not ever fly in or about Little Holmshill Enclosure at four o'clock in the morning, we are never likely to know, but certain it is, that on this particular morning, we did not fall in with the species. However, we had a delightful walk, and our labours were not altogether in vain, for we found several kinds of larvæ which were new to us, and which presumably were night-feeding species, which had not yet concealed themselves from the dangers of the day. The only larvæ we knew were one *A. pyramidea*, taken on bramble, and one *T. cruda*, on oak. Several species of Diptera, too, were represented among our captures, but the only ones named up to the present are *Melanstoma scalaris*, *Hylemyia strigosa*, and *Aricia pallida*. Birds, as has been before remarked, are scarce in the Forest as a rule, but on this occasion we saw a good many,

amongst others a large number of yellowhammers, several starlings and jays, and two whinchats. We also found a green woodpecker's nest, and heard several turtle doves and a grasshopper warbler.

We have seen it stated that the last-mentioned little bird sings while hovering over the bush or clump of grass in which its nest is placed. Perhaps it may do so sometimes (though the story is certainly on the face of it improbable), but there is no doubt that it never does when we are about. On this particular occasion we listened attentively and watched most carefully, but the little songster appeared to be merely creeping about in the bushes in its usual fashion. I have reserved till last the most important occurrence of the morning, which was that we saw a squirrel, the first we had observed since we came to Lyndhurst. Alas! that the keepers should leave us so few.

A cold drizzle came on soon after we had returned to the house (about 7.15), which continued until half-past four in the afternoon, so that we did little else during the day. We did get out for a short time in the evening, but all we found was a larva of *L. aureola*, on the trunk of a beech near the Kennels, which is, I believe, known as "Pretty Beech."

On the 15th we visited Beaulieu Abbey, driving there by way of Matley Passage, Tantany Woods, and Pennerley Gate, and returning by Hatchet Gate, Lady Cross Lodge, and Brockenhurst. Close to Matley Passage we saw a whinchat, and found a meadow pipit's nest (with eggs) in a bank. We spent an hour or more in the afternoon in the neighbourhood of Hatchet Pond, which is a pretty little "loch" with clear water and a shingly bottom, lying amongst the heather of Stockley Moor. Here we found a set of birds entirely different to those we had hitherto been accustomed to see in the Forest, crows, green plovers, and common gulls being numerous. There were also a few ringed dotterel, and we were fortunate enough to find the nest of a pair of these pretty birds. The nest was placed about thirty yards from the edge of the pond, on a piece of very bare ground, on which the heather had lately been burned and had only just begun to sprout again. It was composed of white pebbles (which were plentiful all round), the size of the pebbles gradually diminishing towards its centre. There was, however, in the middle of the nest, one rather large pebble which prevented the eggs being arranged symmetrically plover fashion, as it appeared was intended. By the edge of the pond we found *Ranunculus flammula* growing, and amongst the heather *Drosera intermedia* and *rotundifolia*, and *Galium saxatile*. These last two plants seem to grow plentifully on all the moors and heaths in the Forest. In other respects the day was uneventful, for a strong, cold, north-west wind prevented any insects from being on the wing, and we had no time for larva beating.

We went sugaring in the evening in Rushpole Wood, but it turned very cold indeed, and we took nothing, except single specimens of *E. lucipara*, *M. abjecta*, *T. batis*, and *A. urticae*. We also took, flying at dusk, one specimen of each of the following species: *C. taminata*, *A. subsericata*, *C. immanata*, and *T. lactearia*. Woodcocks were flying about as usual, but we did not hear many nightjars.

The following day (the 16th) was cloudy, with a strong west wind blowing, but there were occasional gleams of bright sunshine, and while they lasted it was nice and warm in sheltered places. On this day we purposed to thoroughly work a portion of the oak wood, which lies to the east of the upper part of Matley Bog, and which is some two miles, or rather more, from Lyndhurst. Accordingly we made a start immediately after lunch, so as to get in a good afternoon's work, and finish up the day by sugaring.

While crossing Matley Bog we took two specimens of *L. icarus*, and one of *L. marginata*; we also boxed four *Simpis tessellata*, at rest amongst the rushes.

On entering the oak wood we found that during the gleams of sunshine a good number of insects were on the wing. *Volucella pelluceus* was flying plentifully in the open glades, and the flowers of some bushes of *Rhamnus frangula* proved attractive to other species of Diptera. The following, in addition to those already mentioned, were taken in the course of the afternoon: *Melanostoma scalaris*, *Chrysops caccutiens*, *Statophaga stercoraria*, *Baccha elongata*, and *Sciomyza albo-costata*. Lepidoptera were not represented by many species, but *F. piniaria* was common in the neighbourhood of fir trees, and *T. lactearia* was everywhere plentiful. *P. ageria*, too, an insect with which we had but a slight previous acquaintance, was fairly numerous, and we took several specimens. Capturing them was, however, by no means easy, in spite of the fact that their flight was not at all swift; and the number of strokes which were required before a specimen was netted, was sometimes quite laughable. The cause of these many misses would seem to be that the speckled black and white of the wings of this species fades off at a short distance into an almost invisible grey. In addition to the species already named, we took one *L. rubricollis*, at rest on a twig in a bush; one *E. trilinearia*, on the trunk of a beech tree, and one *M. ocellata* and one *E. advenaria* on the wing.

During the intervals when the sun was obscured, we applied ourselves to larva beating, and got a quantity of larvæ from oak and beech. None of them, however, were identified except *T. cruda* (several), *C. ridens* (three), and *E. abbreviata* (one), all of which were taken on oak. During the afternoon a large family of long-tailed tits passed us, making their way through the wood.

When the sun got low we sat down to partake of our evening meal, but, as it appeared to be also the midges' dinner hour, it was not long before we got up again. At dusk there were but few moths about, but we netted single specimens of *L. pectinataria*, *A. subsericata*, *M. subtristata*, *C. corylata*, and *C. exanthemaria*; and we took one larva of *C. glabraria*, on some lichen on the trunk of a oak. We heard a grasshopper warbler, and saw several woodcocks.

At sugar we met with greater success than usual, taking six exquisite *T. batis* and one *M. abjecta*. It is a thousand pities that *Batis* fades so terribly after death. To my mind when its colours are still fresh, it is the most beautiful of all the British moths. On this evening we went home rather earlier than usual, having some distance to walk back to Lyndhurst. Here it may be remarked, that when sugaring, our first round (which we go as soon as it becomes dark), is almost invariably, at all places and at all seasons, the most productive; and this is the case even when the trees are re-sugared several times.

On the 17th there was a cold north-west wind blowing, but the sun was bright and warm, and in sheltered spots insects were fairly numerous. About 11 a.m., we started across the White Moor, which lies north-east of Lyndhurst, and here we found *F. atomaria*, as usual, flying in great numbers over the heather. After crossing Matley Passage (where the grasshopper warbler was singing again), and topping the bank opposite, we turned off to the right through the sand-pit, and made our way among the old trees which stand outside the enclosure, until we found ourselves close to Denny Lodge. Among the old trees we heard and saw numerous ring and turtle doves, and also several green woodpeckers. These birds are fairly plentiful in the Forest, but there are hardly as many as one might expect in such a place. Here, too, we found one specimen of *S. fagi*, one or two *E. trilinearia*, one *B. consortaria*, and one *D. orion*, on tree trunks; the two former species on those of beech, and three latter on those of oak. In addition to the above, specimens of *Y. impluviata*, *L. rubricollis*, *L. pectinataria*, and *P. aenea*, were taken with the net. On and around one tree, the bark of which appeared to be getting rotten, was a perfect swarm of *Aricia pallida*; *Eupis tessellata* (one), *Dioctria baumhauen* (one), and *Dryomyza flaveola* (2) were also captured. In a sunny sheltered glade, immediately above Denny Lodge, a fine *M. fuciformis* was flying over some flowers of *Pedicularis sylvatica*, but though approached with the utmost caution it was off like an arrow, before a net could be got within striking distance, and we saw it no more.

We now turned to our left, and descending a wooded slope came to the edge of Denny Bog. Then keeping the Bog on our right, we made a complete circuit of it. When close to Woodfidley Passage, which is beside the

London and South-western Railway, we flushed a full snipe from the edge of the swampy ground. This was the only one of these birds we saw in the Forest.

As we were not much acquainted with marshes, none of us had originally intended to venture far from firm ground, but when we had got rather more than half-way round we noticed some cattle well out in the middle of the bog, browsing on the leaves of *Menyanthes trifoliata*, and not sinking in more than a foot or so. This seemed to show that the bog was not a deep one, and I was accordingly told off to make my way to a clump of bushes in the centre, to see if I could find any wild ducks' or water rails' nests. I found that there was no difficulty in getting to the bushes, the mud being nowhere more than knee-deep, but the search for nests proved quite unsuccessful. There was a water-rail about, and from its excitement it was evident that it had either a nest or young somewhere very close at hand, but what between mud, rushes, bushes, and water (of which there was plenty among the bushes), getting about was no easy matter. Some moor hens were seen; and two herons and five wild ducks rose and winged their way towards the Beaulieu River.

Having walked completely round the bog, we went home almost exactly the same way we had come, seeing nothing of interest however. On our return we found that one of the party having been out for a short time in another direction had taken a nice specimen of *B. repandata*; and had also discovered, on the trunk of a small oak, just outside Lyndhurst, what we consider to have been one of our greatest prizes, viz., two fine larvæ of *C. promissa*. I went out again at dusk, but was quite unsuccessful, the evening being very cold.

The following morning (the 18th) was bitterly cold, cloudy, and with a north wind. We did not go out before lunch, but in the afternoon we did a good deal of larva beating among the trees and bushes on the west of the Brockenhurst road. We got a good many larvæ on this occasion, but the only ones we seem to have known were *E. abbreviata* (several) and *T. cruda* (one), both of which species were beaten from oak. The only insects taken on the wing during the afternoon were two or three *C. temerata* and one *E. trilinearia*, whilst one *H. hectus* was boxed at rest on the leaf of an oak. About five o'clock the wind began to lull, and there was a rise in the temperature, which was immediately followed by the appearance of an unpleasantly large number of midges among the bracken.

In the evening we sugared in Whitley wood, and on going our rounds found that moths were coming a good deal more plentifully than usual. *G. trilinea* was tolerably numerous, and several were taken; one *E. lucipara*,

three *R. tenebrosa*, and two *N. festiva* were also boxed. While sugaring we saw several woodcocks. Soon after entering the enclosure we found a spot where there was a regular colony of mice. They were running about in dozens among the dead leaves, squeaking loudly, and appeared to take very little notice of our presence. There were scarcely any moths flying at dusk, and *S. pectinataria* (two) and *C. temerata* (one or two) were the only species netted. On our way home we saw several glowworms amongst the bracken.

The next day the (19th) we were due to leave Lyndhurst for Bournemouth, but being determined to make the most of our time, we broke our journey twice between Lyndhurst Road and Bournemouth East.

We stopped first at Holmsley, at which station we arrived at 11.45, the morning being bright and sunny, and, for the first time since we had been in the Forest, really hot. We went at once into Holmsley Enclosure, which lies about a couple of hundred yards from the station. Here were dragon-flies in extraordinary numbers and great variety of colour, size, and form. Some had large dark wings; others thick, short bodies, banded with black and yellow; and wings, which for the size of the insects seemed enormously powerful. "Demoiselles," too, were here in swarms, and also the ordinary black and green, or black and blue species, with possibly many more, if many more there be. *A. euphrosyne* and *R. rhamnii* were flying plentifully in the sunshine, the firs were full of *F. piniaria*, there were a few *M. montanata* about, and *L. icarus* (one), *M. subtristata* (one), and *E. advenaria* (one) were taken. Diptera, too, were plentiful, and several species (amongst others *Hippobosca equina*) were captured. There were hardly as many *Syrphidæ* on the wing as one might have expected, but several *Volucella bombylans* were seen, and a nice *Tabanus*, this last, however, succeeded in evading capture. A few larvæ of *O. potatoaria* were noticed, and various nice species obtained by beating oak and other trees. While we were in the enclosure we flushed two pair of woodcocks. We could find neither nest or young where the first pair rose, but close to the spot where the second pair got up there were several nearly full-fledged young ones running about. On our way back to the station we passed a small piece of marshy ground, in which *Potentilla comarum* was growing, as were also the common *Menyanthes trifoliata* and *Orchis latifolia*.

We left Holmsley at 2.26, and at 2.40 arrived at Ringwood Junction, where we made the second break in our journey. Ringwood is outside the Forest boundary, and from what we saw of the country round, it appeared to be quite civilized, but I believe we were unlucky in the road that we chose. Trees were scarce, the road itself straight, hot and dusty, the hedges small and perched on the top of high banks, and moreover, as if the evils already

enumerated were not enough, there was a horrible species of fly, in general appearance not unlike a large midge, which amused itself by getting into our eyes, mouths, and noses, and completely spoiling our tempers. At last, after a walk, the only redeeming feature of which was the number of skylarks singing overhead, we found a favourite hedge, one, that is, which had not been cut for years, and which had a good growth of herbage at its foot. Here we took numerous Diptera, the following being included among the captures: *Lucilia cæsar* (four), *Scatophaga stercoraria* (one), *Bibio pomonæ* (one), *Dioctria Baumhaueri* (one), *Sepsis cynipsea* (two), *Myodina vibrans* (three), *Syrirta pipiens* (three), and *Anthomyia pluvialis* (one). Here also we took numerous larvæ of *B. neustria* on elm, &c., and a few *L. auriflua* and two *A. grossulariata* on hawthorn. Several *D. cæruleocephala* and *B. quercus* were also seen upon hawthorn. We had not been at work long before we heard thunder growling in the distance, and saw a heavy storm approaching from the north-west. We accordingly packed up our traps, and made for the station, which we fortunately reached just before there came on a terrific thunderstorm, which continued till we got into the train at 5.3, and accompanied us most of the way to Bournemouth. This storm was a very destructive one, the Priory at Christchurch being struck and a good deal damaged, and a boat with three coastguardsmen lost in a squall. We also heard that a signalman had been killed by lightning, just outside Ringwood station, while our train was in the act of starting.

So ended our fortnight in the New Forest. Seldom have we spent so pleasant a time, in spite of the fact that the weather was, during nearly the whole of our stay, eminently unpropitious, and we can only hope that it may not be long before we pay Lyndhurst another visit.

Bockleton Court, Tenbury.

PAPERS FOR BEGINNERS.

By ROBERT GILLO.

(Continued from page 43.)

BOXES AND CABINETS.

It is evident that a collector of objects, such as insects, must provide himself with some suitable receptacles in which to place and arrange his specimens, and it is necessary to get these receptacles before any number of specimens are collected. Insects being of a delicate and fragile nature, are soon injured or destroyed by dust or other causes if not placed in close fitting boxes or

drawers, and stored in a dry place. There are various ways of constructing boxes and cabinets for holding insects, some of which I will proceed to describe, and endeavour to point out some of the advantages or otherwise, which in my opinion, attend the use of each particular plan.

There is a method which may be seen in most of the shops of naturalists and birdstuffers, I mean that of placing the insects in a shallow box with a glass top, so that they may be displayed to the view. This plan often commends itself to young collectors, as it affords a means of showing off their captures, and so carries out the ideas with which they started. But there are several very grave objections to the show-case system; the real end of making a collection ought to be to preserve the specimens in the most perfect manner, so as to have them for reference—practical use being the object, not ornament. The show-case method is highly unscientific, as all insects, particularly butterflies and moths, soon lose their colour when exposed to the light, and no one who has any wish to preserve his specimens will adopt it; for who would like to see his collection, no matter how beautiful and showy it may have been when first arranged, soon reduced to a lot of faded and worthless specimens, and no longer “a thing of beauty and a joy for ever.” Of course, if any one wishes to arrange butterflies and moths for the purpose of decoration, some plan of this kind must be adopted. I have seen some very beautiful examples of this kind of drawing-room decoration, notably one in particular in which the insects were arranged on black velvet; but to all these beautiful and interesting ornamental collections there is the drawback, which I have previously pointed out, that the beauty of the colours will soon be destroyed by the bleaching action of the light. The plan, however, has a legitimate use. For educational purposes, for exhibition in schools and popular museums, perhaps it is the best arrangement for showing insects and other objects of natural history, particularly if the cases have covers of American cloth or other suitable material to protect the specimens from light, and so attached to them as to be easily removed during examination, or on occasions when they are likely to be inspected by a number of people, or during class hours; but these cases should be fitted up in such a manner as to show clearly and in an interesting manner some facts connected with the insects, as *e.g.* their life-history, and not to be filled merely with rows of specimens. Something of this kind should I think be placed in every school in the kingdom. Those for board schools should be simple, and contain only a few examples of the best known species, showing the metamorphosis of each insect, as the Common White and the Tortoiseshell butterflies, Tiger Moth, &c., each specimen should, of course, be very plainly and descriptively labelled. Those for high schools or colleges may be proportionately advanced, and show

the principal outlines of classification into orders, families, &c. I feel sure that the exhibition of such cases as those I have described would be attended with the best practical results, as by these means the insects, and some important facts connected with them, would be brought under the notice of an immense number of individuals in the most attractive and agreeable manner.

But to return to the requirements of a young collector, evidently the plan we have been considering will not suit his purpose, therefore, some other form of cabinet or box must be chosen. Whilst he is considering how he shall get a cabinet, and is trying to induce his friends to purchase one for him, it not unfrequently happens that some one who is not an entomologist, and therefore knows nothing of the requirements of the science, and only too often looks upon it as a mere childish hobby, and likely to lead to the spending of more money than is warranted by such a pursuit, suggests that some boxes or drawers already in the collector's possession, or that some friend will perhaps give him, will do very well. These and all other makeshifts will in every case be found to be quite unsuited for the purpose. In the first place it is absolutely necessary that whether boxes or drawers are used, they must be dust-tight and practically air-tight when closed, and in the second place they should be lined with cork, so that the pins may stick in easily, and be held firmly in position. If this is not attended to, many specimens will get damaged, either owing to the collapsing of the pin when the collector is trying to stick it in firmly, or by one specimen getting loose and breaking the antennæ or otherwise damaging other specimens near it. Again, if the boxes or drawers are not very close-fitting, the specimens will be sure to be destroyed by mites, for it is useless to put camphor or naphthaline into the box as a preservative unless the box is sufficiently air-tight to keep in the fumes. If you wish to rid a chamber of insect pests by fumigating with sulphur, you take care to stop up every chink and crevice; for the same reason bruised laurel leaves will have no effect on any insect unless enclosed in a securely corked or stoppered bottle. I mention this because I remember once meeting with a young entomologist who had collected a great many species of lepidoptera, and I chanced to ask him if he used laurel leaves for killing moths, when he replied that he had tried it and found it not to answer; and no wonder, for on enquiry I found that he had placed the leaves with the moths in a cardboard box; of course, no poisonous vapour would have acted efficiently under the circumstances. I have heard persons say that they did not think camphor any protection against mites, and have always found on investigation, that the cause of failure was not in the inefficiency of the camphor as a preservative, but because the case in which the insects were kept was not sufficiently close fitting. It may be thought that the carrying out

of the conditions here laid down would entail the purchasing of an expensive cabinet quite beyond the amount that most young collectors can afford, no doubt this would be true with regard to cabinets, for it cannot be denied that if they are good they are very expensive, and if they are not of the very best make they are undesirable and dear at any price.

Fortunately there are other and more economical plans of storing insects, but before describing these it will be well to state clearly what is meant by a good full-sized cabinet, and what such a cabinet would cost.

The usual number of drawers in a cabinet for lepidoptera is 30, size of each drawer $17\frac{1}{2}$ inches by $15\frac{1}{2}$ with camphor cells either in front or at the sides, each drawer lined with good cork, and neatly papered, and covered with accurately fitting glazed frames constructed to lift off and made of mahogany or other hard wood, and the whole enclosed in a case with two folding panelled doors, French-polished and generally finished off in the best style. Such a cabinet as this would cost about £18 which is at the rate of 12/- per drawer. One consisting of half the number of drawers would perhaps do for a collection of the macro-lepidoptera, provided it is not intended to make it an exclusive one, by this I mean a collection consisting of about four or six specimens of each species, and no attempts made to illustrate varieties, which is now so very usual with collectors. Cheap cabinets are decidedly to be avoided, for they are generally made of soft wood and with inferior workmanship, so as to keep the price of the articles down, although they may have highly polished and very beautiful doors so as to look very attractive on the outside, but internally are "cheap and nasty." Even with the very best made cabinets it is nearly impossible to get drawers perfectly dust-tight; several plans have been tried to attain this end, some have been made with the glazed frames to slide off instead of lift out, and I remember once seeing a cabinet in which the glass was fixed to the tops of the drawers and the insects were got at by removing the bottoms, I do not know that there is any special advantage in either of these plans. My own idea of a perfect cabinet is as follows: drawers made of galvanized iron lined with thick cork attached with marine glue, and the tops of plate glass. The rebate for the glass having a thick stripe of vulcanized indiarubber for it to rest upon and kept down in close contact with some pressure, an arrangement of strong springs would probably be best for this purpose, such a cabinet would, I think, be the proper receptacle for valuable or type collections, and for such as those in our national museums; insects placed in it would be as nearly everlasting as it is possible to render them.

After many years experience and inspecting many collections I am in favour of boxes in preference to cabinets. The form which appears to be best is

the ordinary one, like a draught and backgammon board about 15 inches by 10½ is the most convenient size. This may of course be a matter of opinion, but large boxes are in my opinion very objectionable. These boxes must, of course, be well made, not merely nailed together, and so constructed as to shut closely with a rebate that dust may not enter; they must be lined with good cork, I mention this, for as it is a costly item I have noticed that most of the boxes sold by dealers have been lined with a very indifferent quality of cork and not neatly papered. The temptation to use inferior cork is no doubt great, as the cork is covered with paper so as not to be visible. Many attempts have been made to find some cheap substitute for cork. Thick flannel has been tried, but it only answers fairly well and is not to be compared with cork for a moment. Good fine felt such as is used for covering the hammers in a pianoforte is a fairly substitute, but the price comes up to that of cork, so I am afraid that for the present, at least, the only material suitable for our purpose is the best selected cork. There is, however, a substance advertised called "Turf-plates," a German production, which is rather more than half the price of cork, but as I have had no experience with it I cannot say anything as to its efficiency. It is also important that the paste used for attaching the paper to the cork should be poisoned, and for this purpose I think nothing is so effectual as a little powdered corrosive sublimate, carbolic acid prevents paste from smelling and becoming mouldy, and is therefore a good thing to add as an antiseptic, but I do not think it is so reliable as the sublimate. The greatest care is necessary in using corrosive sublimate (bichloridæ of mercury), as it is a very strong poison.

These boxes should be distinctly labelled and numbered on the outside, and arranged on shelves in the same position as books. The advantages to be derived from using them in preference to cabinets are many, and I will mention some of them. First, they cost only from one-third to one-half the price of cabinet drawers. Secondly, they are more portable and far more practically useful, there being no glass tops to remove every time it is wished to examine any particular insect. Thirdly, their number can be added to as the collection grows, in fact you can begin with a single box, and extend the series without limit; again if you find you have not sufficient room for any particular family, you can introduce another box without rearranging the whole collection. It will be seen at once that you cannot do this with a cabinet, as you are limited at the outset, hence the reason for having one with a large number of drawers, for should you not have room enough by only one drawer you cannot add it, the only way is to have another cabinet. To overcome this difficulty Canon Tristram, the Eastern traveller, who has most extensive collections, has his cabinets made of one uniform size, and the

cases without any plinth or projecting mouldings at the sides, so that they can be placed one on the other or by the side of each other, without loss of room ; or should you find that you have not room for a particular group, which is sure to be the case as the collection proceeds, unless all the drawers are exactly alike, and consequently interchangeable, you must rearrange the whole collection, and this with a thirty-drawer cabinet is a very long and tiresome job. An entomologist whom I happen to know, and who has a very large collection of beetles, both British and Foreign, and to whom cost is not a consideration, has abandoned the use of cabinets in favour of boxes such as I have described, and for the very reasons I have been trying to explain.

With a view to assisting his young friends, the Editor has taken the trouble to obtain some boxes, which he will be pleased to send at 4/6 each to any one who may communicate with him. I have seen a sample of these boxes, and I think they are in every way well suited for the purpose and thoroughly reliable.

Possibly some, notwithstanding all I have said will still choose a cabinet ; and I suspect this will be so because it is a more imposing and showy looking piece of furniture, which may be placed in the drawing-room, whereas boxes on shelves would hardly be considered fit to be located in such an apartment. For the assistance of these collectors there is a club, I believe, already in existence, by joining which they may obtain a really good cabinet, by the weekly payment of a small sum. The plan of working this club is, I understand, as follows :—The club will consist of any number of members, the payments to be 2/6 per week for 120 weeks. As soon as the subscriptions paid amount to a total of £15, a cabinet of this value is to be purchased ; a ballot will then be taken and the cabinet sent to the winner immediately, but although it is placed in his possession it does not become his property, but is to be vested in trustees, who will have legal power to re-obtain possession of it if the weekly subscriptions are not punctually and regularly paid, until the whole of the 120 subscriptions are paid, when it will become the property of the subscriber absolutely. Such are the outlines of the rules and methods of working this club, but if any one should be desirous of joining it, or of obtaining further information, he had better at once communicate with the Editor.

In conclusion I should like to impress on young collectors the importance of well weighing the various reasons I have advanced in favour of boxes, as I feel sure if they do so they will decide to use boxes, and they cannot in the first instance do better than get one from the Editor which will do to begin with, and then they may continue adding box after box as they succeed in collecting the insects, until an interesting and valuable collection is the result,

It is of course necessary to keep each box stocked with some preservation to destroy mites, and nothing is more effective than a particle of naphthaline, about the size of a hazel nut, wrapped in a piece of muslin and securely pinned in the corner of the box. If this is attended to, the insects will be preserved for years, and should the collector, from pressure of business or other causes, be obliged to put aside his entomological pursuits for a time, when he returns to it he will find his previous captures in good condition, so that he will again be induced to take up his favourite study with pleasure and enthusiasm.

(To be continued.)

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 1, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the chair.

Mr. Philip Crowley exhibited the following specimens of Diurni, from the Kareen Hills, Burmah:—*Papilio Zaleucus*, *P. Adamsoni*, *Papilio* ? sp. (male and female), and *Nymphalis Nicholii*.

Mr. T. R. Billups exhibited several specimens of an ant found at Kew, frequenting a species of palm from Tropical Australia, and which had been determined as *Tapinoma melanocephalum*; also living specimens of *Carabus auratus*, from the Borough Market, and of a species of *Blaps* from Northern Africa.

Mr. Waterhouse exhibited a specimen of a Brazilian Locust, *Conocephalus* ? sp., which he had for some time preserved alive, and which had only died that same morning. He called attention to the change of colour which he had observed in the eyes of this insect; in a bright light they were dirty white or horn-coloured, with a black dot in the middle; but at night, or if the insects were confined in a dark box, they became altogether black; shortly after death, also, the eyes became black. Mr. M'Lachlan observed that he had noticed a darker spot in the centre of the eye in certain Ephemera, and in other Neuroptera. The discussion was continued by Dr. Sharp and others, but no one seemed to be able to account for the alteration in question.

Lord Walsingham exhibited specimens of *Cateremna terebrella*, Lk., a species lately taken in Britain, which he had caught in Norfolk, and bred from fir-cones gathered in the same locality.

Mr. Meyrick read two papers, "On Pyralidina from Australia and the South Pacific" and "Descriptions of some exotic Micro-Lepidoptera." In these papers about sixty new species were described. A discussion ensued,

in which Dr. Sharp, Mr. Stainton, Mr. M'Lachlan, and others took part. Mr. Meyrick stated that, as far as the Pyralidina were concerned, Australia could not be regarded as a separate region, for a large number were not endemic, but appeared to have been introduced from the Malay Archipelago. The method of this immigration seemed doubtful. Mr. Meyrick was of opinion that the insects flew very long distances, and effected a settlement through their food-plants being widely distributed and common. He instanced the undoubted immigration of certain Australian species into New Zealand, a distance of 1200 miles. Mr. Stainton adduced the instance of *Margarodes unionalis*, which is a South-European insect, feeding on the olive, yet is occasionally found in Britain.

Mr. Meyrick also made some observations on the distribution of the insect fauna in the various regions of Australia; he said that it appeared to be more or less different in certain defined portions of the continent, which might be roughly regarded as oases in the midst of desert districts: all his observations, however, had tended to upset Mr. Wallace's theory that Eastern and Western Australia were originally separated, as the gradations in the insect fauna from east to west were quite gradual; in Western Australia the Tineina were the only group well represented by peculiar endemic forms.

Mr. Pascoe read a paper "On the genus *Byrsops*," a genus of Curculionidæ.

The President announced that Lord Walsingham's collection of Lepidoptera and larvæ, recently presented to the nation, would be exhibited in the Hall at the Natural History Museum, South Kensington, until the end of June.—W. W. FOWLER, Hon. Sec.

HAGGERSTON ENTOMOLOGICAL SOCIETY.

May 26th.—Mr. Hockett, Vice-President, in the chair. Mr. Pearson exhibited *S. radiella* and *L. argiolus*; Mr. Hanes, a very fine series of *C. verbasci*; Mr. Russell, a long and variable series of *L. alexis*; Mr. Sampson, a specimen of large green grasshopper; Mr. May, larvæ of *B. quercus* and *C. caja*; Mr. Lusby, *A. betularia*, *S. carpini*, and others; Mr. Clark, a very fine series of *A. mendica*. Some of the members had visited the New Forest and Croydon, and found species very scarce. Mr. Russell opened the discussion on the life history of *L. alexis*, with a description of the larva and both sexes of the imago. This species seems to be generally distributed on the Continent, where it is called by the name of *Icarus*, and also occurs plentifully in Northern and Western Asia. The flight is not very rapid. Some specimens rather larger than the ordinary type have been taken at Finchley and Box Hill. Messrs. Hockett and Clark had each taken a hermophindite of this species. Mr. Pearson

stated that specimens taken at Epping Forest seemed to be brighter than those taken elsewhere. Mr. Hanes said that he had observed the female ovipositing on *Lotus corniculatus* at Box Hill, but had not succeeded in rearing them.

June 2nd.—This being the yearly meeting, the evening was taken up with the Secretary's report, balance sheet, and election of officers. The report stated that the Society had considerably increased the number of its members during the last six months. The discussions on the life-history of eight species had been of unusual interest. There had also been additions made to the library and cabinet by the members. A list was then read of the principal exhibitions that had been made. The Treasurer read the balance sheet, which shewed a good balance in favour of the Society. All the retiring officers were re-elected, with the addition of Mr. Anderson and Mr. Russell acting as Joint Secretaries. After a long discussion on the report and balance sheet, the meeting terminated with a votes of thanks for past services.

June 9th.—Mr. Pearson exhibited larvæ of *T. munda*; Mr. Hanes, *S. populi* and *E. punctaria*; Mr. Hockett, *N. pulveraria*, *M. sociata*, and *P. petraria*; Mr. Anderson, *T. biundularia*, *N. pulveraria*, and *E. exigua*; Mr. Gurney, *A. betularia* and *B. omicronata*; Mr. Sampson, *L. alexis*, *L. agestis*, *A. cardamines*, *S. malvæ*, and *N. tages*; Mr. Harper, *L. adonis*; Mr. Lane, *C. elpenor*; Mr. Lusby, *L. alexis*, *A. cardamines*, *P. vitalbata*. Several members had paid visits to Epping Forest and Box Hill, and found insects more abundant. Mr. J. A. Clark, M.P.S., opened a discussion on *L. adonis* and *corydon*. He said that the larvæ of *L. adonis* was so very similar to that of *L. corydon* that he thought it would be as well to couple the two and discuss them together. The larvæ of *L. adonis* is of the usual character, of dark green colour, with two rows of short yellow streaks on the back, and a yellow longitudinal stripe at each side. The larvæ were sent about the middle of July, full grown, with a good supply of vetch, in three or four days after they had been received, they hid themselves under the vetch for pupation, and finally the imago emerged about the middle of August. This species, as far as the colour is concerned, is the most beautiful of all the "Blues." The upper surface is the most delicate blue, the effect of which is at the same time heightened and refined by the snowy whiteness of the fringes. The female has the upper surface of the wings a rich deep brown; it is rather difficult to distinguish some of the females of this species from those of *Corydon*. Mr. Harper drew the attention of the members to the specimens exhibited by him, being spring specimens from Croyden, and autumn specimens from Folkestone, the latter being much finer. Mr. Hockett thought that if Mr. Harper had taken the spring brood

at Folkstone he would have seen a difference. After some further discussion, Mr. Clark mentioned that the larvæ of *Corydon* and *Adonis* were so nearly allied, that even such authors as Buckler and Hellins failed to detect any difference, except a slight variation in the colour of the hairs. Mr. Hockett said that though the larvæ seemed so alike, there was only one brood of *Corydon* against the two of *Adonis*.

June 16th.—Mr. Hockett, Vice-President, in the chair. Mr. Russell exhibited two specimens of *D. irregularis*, bred; Mr. Sampson, series of *A. euphrosyne*, one of which was rather dark; Mr. Hanes, *N. lucina*, *T. rubi*, and *A. euphrosyne* (a fine variety, the hind wings suffused with black; Mr. Clark, specimen of *C. plantaginis* bred this day, also a very fine series of bred *E. curzonii*. Mr. Grey had taken *C. porcellus* and *L. adonis* at Reigate; Mr. Anderson brought forward the discussion on *L. acis*. This species he had not had any personal experience with, and had gathered his information principally from the volumes in the Society's library. In classifying this as an extinct species, we are, perhaps, wrong, as we have records up to a very recent date, but there can be no doubt that it is only a question of a few years before it will cease to be truly a native, although some fifty years ago it appears to have been observed abundantly in many localities widely distributed from each other. Year after year, however, it has become rarer and rarer, making its last stand in the neighbourhood of Cardiff; and that enemy of the entomologist—the builder—having destroyed the spot, there is indeed only too good a reason to believe that in future we may look in vain for British *Acis*. Kirby, who calls this species *Semiargus*, states that it is common throughout Europe and part of Asia, being on the wing from May to August. Mr. Anderson was of opinion that there are two broods, which run into each other. The larvæ is stated by the same authority to be covered with fine yellowish-green hairs, and to feed during August and September, on *Anthyllis vulneraria* (the Kidney Vetch). Stephens, in his "Illustrations of British Entomology," published close on 60 years ago, describes it as a scarce and local species, inhabiting chalky districts, at the end of May and again in July; he further mentions Norfolk, Cambridgeshire, Yorkshire, Dorsetshire, and Surrey, as counties in which it could be obtained, and also mentions a locality near Brockenhurst, in the New Forest; he makes no mention whatever of the larva. Mr. Newman mentions it was very common in Herefordshire about 50 years ago, he having taken it at Leominster in some numbers, but it would appear to have very quickly afterwards become scarce. Since, in 1849, we find that the Rev. J. Greene thinks it of sufficient importance to record the capture of two specimens. Advancing another ten years, Stainton, in 1859, records it as almost extinct, and the larvæ at that

time unknown. For a long time after this probably but few captures took place. In 1871 six specimens were recorded, and in 1874 it was found at Penarth, near Cardiff. In that year there is no doubt that Mr. Langley took ten specimens (eight males and two females), while four were taken in the same locality by Mr. Williams, and very possibly more were taken but not recorded. In the following year both these gentlemen seem to have been on the alert for its re-appearance, but though they doubtless visited the spot very frequently and in good time, they only obtained one each, so that it seems that the species was having a clear fight for existence in that year. The following year, however, that is to say 1876, a dozen specimens were captured by Messrs. Breaks and Heath, still in the same locality, the time of all these captures being June, so that the insect there at any rate would appear to be single brooded. In 1883, one specimen was taken at Tenby, flying over wild thyme, and another was seen and in fact netted, but managed to escape. This appears to be the last record from Welsh localities, for next year the spot at Penarth, which now constitutes the fashionable suburb of Cardiff, was entirely built over, and there have been no captures in the vicinity since. There is, of course, a probability of its being re-discovered in some nook on the Welsh coast, but at any rate up to the present nobody has been so fortunate, though we may be well certain that it has been vigorously hunted for. There was a specimen said to have been taken at Abbotswood, in July, 1881, and in the *Entomologist*, for 1880, Mr. Sydney Oliff states that in looking over a boxful of "Blues," captured at Croham Hurst, in August of that year, he noticed an unusual looking specimen, which upon comparison proved to be *Acis*. If this were true it would appear at any rate to be a blown over specimen, since we can hardly credit that this species existed anywhere in that district unknown to the members of this Society and London collectors in general; the time, too, is much later than any other British record, and, therefore, I consider that Mr. Oliff in this case was a victim of a deception—although Croham Hurst would seem to be a very extraordinary locality, having produced, according to records lately made, *D. Galii*, *P. chryseis*, and some species previously unknown to Britain. In flight and appearance the insect chiefly resembles the common *Alexis*, but it has a dark look, and would hardly get overlooked if seen; it is very local in its habits, a fact which has probably aided its disappearance in Great Britain. A theory has been put forward that the cause of its extinction is that large numbers of the larvæ were destroyed in haymaking time. Whether this has any bearing on the subject is a question upon which I am unable to give an opinion, as I am not sufficiently acquainted with the habits of the food-plant. If it grows in hay fields, it would doubtless get partially destroyed by the movers: but one

would imagine that as haymaking is a very old institution, if it had the effect of destroying *Acis* larvæ, it would have exterminated the species years and years ago, unless the time of mowing is altered, which would rather affect the question. If, however, the *Anthyllis vulneraria* is more of a wild plant, growing among the varied herbage which covers chalky soils, we must look for other reasons to explain the disappearance of *Acis* from among us. Climatic changes are, I think, very likely to have had much to do with it. Mr. Pearson said that in 1880, a late member of this Society paid a visit to South Wales, and amongst the captures were five or six *L. acis*.—J. RUSSELL and E. ANDERSON, Joint Secretaries.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

April 28th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Mr. Helps exhibited *Deilephila livornica*, Esp, from Coles Cross, near Crewkerne. Mr. Lea, *Tæniocampa munda*, Esp., *T. gracilis*, Fb., and *T. leucographa*, Hb., taken in Herefordshire, at sallow. Mr. Soure, forms of *Lycæna corydon*, Hb. and *L. adonis*, W.V. (*Bellargus*, Rott.), also a specimen of a *Zygæna*, and stated that it was probably hybrid between *Z. filipendulæ*, L. and *Z. trifolii*, Esp. Mr. Sheldon, red and clay coloured forms of *Tæniocampa cruda*, Esp., one very curious specimen having the wings on one side red, and on the other clay coloured, also a series of *Scoparia augustea*, St. Mr. Tugwell bred examples of *Cidaria suffumata*, Hb., *Nyssia hispidaria*, Hb., *Hybernia progemmaria* var. *fuscata*. Mr. Jager, *Eupithecia pumilata*, Hb., bred from flowers of clematis and hemp agrimony. Mr. Adkin, very large specimens of *Anticlea badiata*, Hb. Mr. S. Edwards, a long series of *Papilio merope*, Cram. Mr. J. Jenner Weir contributed some observations on the difference in appearance of the two sexes. Mr. Billups, exotic species of Coleoptera comprising examples of the family *Scarabæidæ*, including the genera *Phænœus*, *Onthophagus*, and *Gymnopterus*; he also exhibited on behalf of Mr. W. T. de V. Kane, examples of *Mesites tardii*, from Monaghan, Ireland. Mr. Cockerell, a number of slugs from Cherbourg, found in the Borough Market, including *Limax agrestis*, L., and var. *sylvatica*, Mog., *Arion bourguignati*, Mabilie, &c. Mr. J. E. Kelsall contributed a paper on British bats.

May 12th.—The President in the chair. Mr. Cooper exhibited bred examples *Aleucis pictaria*, Curt., *Macaria alternata*, Hb., *Cymatophora ridens*, Hb., from Epping Forest, and *Spilosoma mendica*, Clerch., from Wansted Flats. Mr. Cockerell exhibited mollusca found in the Borough Market, among lettuces from St. Malo; a number of species from Lofthouse, near

Wakefield, found by Mr. George Roberts, and examples of *Scalaria pseudo-scalaris*, Broc., from Mogador, collected by Mr. J. H. Ponsonby. Mr. Cockerell stated that this species had been recently added to the British list and contributed notes on his exhibit. Mr. Kelsall exhibited specimens of the Palmated Water Newt (*Lissotritron palmipes*), and contributed notes.—H. W. BARKER, Hon. Sec.

NOTES ON ISLE OF MAN CAPTURES IN JUNE.

By C. S. GREGSON.

I have just returned from a few days collecting in the Isle of Man. I found the season a late one. Plants which usually bloom there in May, and should now be in seed, are yet in full bloom. The *Lychnis* feeders are constrained to eat leaves and flowers, there being few seed capsules formed yet and fewer with seed in them. On the first night I was accompanied by a Reverend gentleman, whom I met on the boat accidentally, but who was desirous of seeing some rock collecting. The results so far as I was concerned on that night, were five pupa of *Sesia muscaformis*, one *Eupithecia constrictaria*, several *E. venosata*, one *E. vulgata*, several *Setina irorella*, one *Xygana filipendula* var. *cytici*, several *Gelechia instabilella*, and a nice series of the larva of *Gelechia leucomelanella*. To get this larva it is best to climb up to small plants of *Selene maritima*, growing in fissures on the face of the rocks. Observe if any of the shoots of the plants are appressed and tied to the face of the rock, if so, examine carefully for a slightly obese yellow or yellowish-green larva, with a black head and corslet. Secure your own footing first, then get the larva. Bad specimens of this species still stand in our collections as *G. vicinella* (Douglass), but I do not know if Zeller's name has precedence. My friend, being more botanist than entomologist, wished to see *Cochliaria danica* in its home (damp places on the rock), we scrambled down to a patch, and under the leaves *Plutella annuletella* was feeding freely. We had now done a fair evening's work, including a number of commoner species, which my friend noted as I gave him their names. Dusk coming on I settled down to attend to a nice patch of flowers of *Selene maritima*; soon my old acquaintance, *Dianthæcia* var. *capsophila*, came buzzing about, and was netted, only to be ignominiously turned out again, because a magnificently blue *Dianthæcia Cacia* var. *manani* darted to the flowers, and was going sidelining off like a sphinx does, when it was netted and boxed; only one other *Manani* was seen that night, but several fine *capsophila* were secured. As

Cæcia only flies about twenty minutes, and its flight being over, I lighted up and secured one larva each of *Polia nigrocincta* var. *statices* and *Epunda nigra*, and this closed a very pleasant evening and night on the rocks at Isle of Man in June.

(To be continued.)

NOTES AND OBSERVATIONS.

JOTTINGS FROM GLASGOW.—What delightful weather we have been experiencing during the past few days! What glorious weather for the woods and fields, and how one longs to get away from the close and musty city, out to the green and open country, where insect life abounds! And yet, in such weather as this, when the longed for opportunity arrives, the ardent entomologist finds collecting anything but the pleasure he anticipated. The very woods seem like a furnace, and to pursue active insects on such a day is by no means recreative. On Saturday last the members of the Clydesdale Naturalists' Society paid a visit to the Paisley district, for the purpose specially of collecting lepidoptera. The day was extremely warm, so hot, indeed, that we only ventured a short distance from Paisley, to the Newton Woods, and here, after a short search for specimens, we had to give up collecting and seek the shelter of the shadiest pine trees. Even that very desirable variety, *Bouchardana*, a specimen of which was startled from a pine branch and netted, was not sufficiently attractive to induce us to further exertion in that fierce broiling sun. Our captures, consequently, were by no means numerous, but most of the specimens taken had the recommendation of being in splendid condition. *Eupithecia indigata* was pretty common among the pine trees, and by shaking the branches a fair number of *Fidonia piniaria* were startled and netted. I perhaps saw more specimens of the female of this species on this occasion than I can remember having seen before. This was, no doubt, owing to the great heat of the day, for I have often noticed that the female, usually a sluggish insect, will not readily take flight unless on a very warm day. We saw almost as many of the one sex as of the other. *Odontopera bidentata* was taken at rest on a pine trunk, and *Lophopteryx camelina* on a beech. These, with a number of very good tortrices, completed our captures for the short time we were at work. The lepidopterists here are now busy gathering in a rich harvest of nice specimens while the opportunity lasts. Cold wet weather made the season somewhat late, but these last few splendid days have brought out insect life in great abundance. At one little

spot at Pollok Shields, *Emmelesia alchemillata* may be seen literally in thousands, while not far distant *Hepalius lupulinus* may be taken at dusk in greater abundance than I have ever seen it here. Most of our local species are in corresponding profusion at their various localities, and everything points to our having a really splendid collecting season. I trust that circumstances are quite as favourable in other places as they are here. It would be interesting to hear what fortune favours our friends in other localities.—JOHN MACKAY, Kingston, Glasgow.

GOOD FRIDAY AT SEVEN OAKS.—I spent Good Friday at Seven Oaks. It was fine but a bitterly cold day. We were a party of three and our captures were one *Parthenias*, one *Flavicornis* (a cripple), and one *Lithoriza*. A heavy catch, averaging for expenses 5/- each moth. Encouraging certainly, but we made it up in fresh air! Sallows were late, and so dried up, they are over directly. I have searched two nights and found *nothing*; others were more fortunate and got *Cruda* and *Instabilis*!! Monday, 18th April, was another East-windy, cold, fine, day. At Wickham, *Parthenias* swarmed, but they flew so high they were difficult to capture. I got four in as many hours, also saw *Flavicornis* and took two *Cruda* on the wing. *Tortrix hyemana* was abundant. Others got more *Parthenias* than I did, and that is all I have to record so far, of my doings this year.—JOHN HENDERSON, Herne Hill.

TEPPROSIA CREPUSCULARIA AND BIUNDULARIA.—I have been on the hunt since Easter for *Crepuscularia*, having made four journeys for it in a fortnight without obtaining a single specimen. My friend Mr. Watson, who accompanied me was more fortunate, taking seven specimens in the four trips. One of his friends favoured him with a few green ova, from which he now has eleven larvæ feeding, and fine healthy fellows they seem. I have made many enquiries of collectors about the species and the invariably reply is, "Oh! a common moth, plentiful at Wickham!" Perhaps so, though my experience scarcely bears this out, but I suspect our old friend *Biundularia* serves for most of them. On May 15th, I paid a visit to the woods and got eight fairly good *Biundularia*. My friend only got two, but one of them laid him a batch of eggs immediately. Mine were all males of course. I will try again some evening and see if more are to be had. There are pheasants about and keepers, so one has to be careful. It almost looks as if the moths were aware of this for they invariably rest on the trees nearest the keeper's lodge, and it would not be pleasant to be interfered with and turned out before a moth was secured.—JOHN HENDERSON, Herne Hill.

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THE A B C OF BEEKEEPING—AS A HOBBY OR FOR PROFIT.

BY ROBERT J. BENNETT, VICE-PRESIDENT, CLYDESDALE NATURALISTS' SOCIETY.

Read at a meeting of the Clydesdale Naturalists' Society.

THE honey-bee has been a wonder to man and held in admiration by many observers in all ages. Several remarkable passages in Holy Writ show that honey was then held in higher esteem than in these degenerate days when sugar or saccharine matter is obtained from cane, beet-root or even coal-tar.

QUEENS.

In summer, as is generally known, a hive contains the Queen or mother-bee, the Drone or male bee, and the Worker or neuter bee. The queen is by far the most important personage in the hive, because she is really the mother of all the bees it contains, and when we consider that during the height of the season she deposits from two to three thousand eggs on an average in twenty-four hours, we get some idea of the enormous labour she undergoes, and her instinctive desire to retain supreme rule over her empire. If you deprive a hive of the queen the bees at once set to work and raise another, and this they are capable of doing so long as they have eggs or worker larvæ in the hive with which to do it. The queen is reared from the egg or grub of what would have been an ordinary worker, had not the bees (who have this power) selected the grub or larva before it attains the fourth day as after this date the opportunity seems to have passed away. When they select an egg or larva for transformation, they gnaw away the adjoining cells until the base of the royal cell is equal to about three ordinary ones, when they elongate it till it becomes almost like an acorn in shape, they

then supply the larva with a milky food supposed to be a mixture of pollen and honey partially digested in the stomachs of the workers, and called by bee masters "Royal Jelly." The substance is given sumptuously to the larva and about eight days after the egg has been deposited, the cup or lid of the acorn-like cell is sealed, after which the larva rapidly undergoes transformation and in about eight or nine days thereafter, say 16 or 17 in all, so that there are four days in the egg formation, four in the larva and eight in the pupa, she makes her appearance amongst them as their queen. She is easily recognised among a crowd of workers from the great length of her abdomen which tapers to a point, her head is rounder, her trunk more slender, more elegant, and much shorter, her legs are longer and without the pollen basket, and her wings are not more than half the length of her body and she is also different in colour from the rest of the colony. We have now traced her course until it is time for her to take her wedding flight. Feeling that she is of far more importance to the colony than other bees, she walks out on to the alighting board with a queenly step, she notes all the points with exactness, then makes a small circle in the air coming back to the alighting board, she afterwards repeats this circle extending it each time, but should a cloud come across the sun it is enough to send her home for that day, and a change of weather may postpone the wedding tour even for ten days, although in ordinary cases they generally begin laying on the eighth or ninth day. After she knows her home she ventures out boldly, and fertilization takes place on the wing. After a successful flight, she returns often with the organs of the drone remaining attached to her body. This accomplished she goes quietly into the hive having no wish to leave it thereafter. Should you have the good fortune to see her next day, all trace of the appendages will possibly be a shrivelled thread, and in a day or two after she is found busy depositing eggs. From her birth till this time she shows wonderful activity, running all over the hive, and difficult to catch; but now she walks slowly and sedately, the abdomen swells and she quietly settles down to the business of her life.

DRONES.

Drones are the male bees and their mission seems to be fertilization of young queens. They usually appear at the end of April or beginning of May, and their numbers vary from two to three hundred in one hive. They are generally about one-third larger than the worker bees, are darker in colour, possess neither poison-bag nor sting, have a deep bass hum, have no pollen basket, and are not fitted for the internal economy of the hive beyond keeping up the temperature, which, however, in this variable climate is very

necessary. Fertilization is never effected within the hive. Young queens and drones have great power of flight, in proof of which I may mention that when I introduced the Italian bees to the Holy Loch, the hives with black bees on the Kilmun side were soon filled with them, and a namesake of mine who lived at Kilmun had hybrids the following year. Drones are usually killed so soon as honey gathering ceases, but I have seen on a wet day in July, before honey gathering had ceased, the young drones drawn out of their cells and massacred without mercy, though I have also had them in my hives in November. Supposing them to be hatched about May, this gives them a life of about six months. Their fate seems a sad one, but it seems to be the inexorable law of nature. It would appear that drones soon spy out a young queen as she is circling in the air, and procure the meeting of the two insects, which takes place while they are on the wing, when the two may be observed whirling towards the ground, but it is difficult to say how fertilization is accomplished, though one thing is certain, viz.—that the organ of the drone is so firmly implanted in the body of the queen, that it is torn from his body with all its attachments, and some writers declare that he dies as if struck by lightning, but I am inclined to believe that he has power to crawl about after he reaches the ground, before he dies. One thing is certain that once fertilized, the queen during her life, which may be three years, remains so.

WORKERS.

Worker bees and the queen, for the major part of the year are the only occupants of the hive. The workers, also called neuters, are undeveloped females, and a hive may contain from 6,000 to 50,000, according to the season and system of management. They are the smallest bees in the hive, and have very long tongues to enable them to suck out the secretions of flowers and blossoms. They are also furnished with baskets on the thighs of their hindermost pair of legs, to enable them to carry home the pollen they collect from the stamens of flowers. Honey and pollen are prepared by the workers into a pulp commonly called "bee bread" for the food of the larvæ, and it is placed round them at the bottom of the cell which is sealed about the 10th day, and about the 20th or 21st the young bee comes to maturity. The worker bee also secretes wax from saccharine substances, and the scales are produced by the wax glands, of which there are eight, situated beneath the abdominal segments. This is wrought between the mandibles and used in making cells for the brood and storage of honey. There are about five worker cells and four drone cells to the lineal inch, but while they do not adhere to a uniform size of cell they keep a uniform distance from centre to centre, viz.— $1\frac{1}{2}$ inches, unless when storing honey when I have

found comb $3\frac{1}{2}$ to 4 inches thick, though it looks best when you confine them to an average of two inches. If the honey flowers be abundant comb building goes on very rapidly, and the cells at the top and sides are soon filled with honey while the centre is left for the brood.

SWARMS.

When bees are kept in straw skeps natural swarming is generally resorted to by the bees. The first swarm is ready to come off when the hive is full of bees and comb as well as brood and honey. The external signs are when they rush from the hive with extended wings and play like young bees or those out for an airing. Shortly before leaving they fill them themselves with honey, and it is the queen or mother who leaves with the first swarm. The sight of queen's cells warns her to prepare, and scouts are generally sent out to find a home, and when this is accomplished she may leave her old kingdom any time between 9 a.m. and 3 p.m. I have not seen in my hives any first swarm after that hour. The sight of a swarm is one of the most exhilarating and delightful description to the beekeeper. The second swarm usually comes off about eight or ten days after, but is seldom so strong, however, should the season be a good one it is often the best one to weather the winter, and moreover, it is almost certain to have a young, fresh queen in her first year. I believe want of room to be the most general cause of swarming.

DRIVING.

A knowledge of the process of driving is highly essential, as only by its means can any of the operations in the most simple form of bee management be performed. It should be done in the middle of a fine day, when the majority of the bees are out gathering honey, as then there is less difficulty in ascertaining the presence of the queen amongst the driven bees, as she is more easily picked out in her passage upwards. Care should always be taken in the removal of the hive from its stand to place an empty hive in its stead, so that the bees when they return may find a domicile, otherwise they are apt to enter an adjoining hive and cause mischief. A little smoke should be blown into the hive which you intend to drive, and in a minute or two lift it off its floor-board and turn it bottom up. Then place an empty hive the same size over it, and if it be your first attempt at driving them, to give you confidence place a piece of towelling round the joining, so that none of the bees may escape to annoy you. By drumming the lower hive with the hands so as to cause a slight jarring to the combs, you frighten the bees and they will run up into the empty hive, and thus the swarm is effected it may be in 15 or 20 minutes. Care and judgment are required, and the first thing is to

find the queen and either see her or satisfy yourself that she is among the driven bees, after which, place the driven swarm on the old stand, and the old hive at some yards from it. The reason is that the bees left in the old hive will be young, and the old hive containing a large quantity of mature brood, the hatching of which so speedily recuperates the strength of the hive that in a few days it becomes as populous as ever. Knowing no other locality the bees stay in the old hive, hatch the brood, and raise a new queen by the process already described. There is an old adage that—

"A swarm of bees in May is worth a load of hay,
A swarm of bees in June is worth a silver spoon,
A swarm of bees in July is not worth a fly."

BEEKEEPERS.

Those who should keep bees as a hobby, are close observers, who have a garden where they can spend an hour or so morning or evening, who are calm and courageous and have endurance to bear the first sting or two, but beginners until they get used to stings should provide themselves with a veil to protect the face. Many bees are very quiet and with gentle handling almost any operation can be performed, and a little experience and enthusiasm will easily accomplish the rest. Those who should not attempt to keep bees are persons with offensive smells or bad breaths, workers in tanneries or chemical works, dark complexioned people or those wearing dark clothes, such being all, more or less, liable to attack.

COMB AND FOUNDATION.

It has been estimated that the bees have to digest 20lbs. of honey to produce 1lb. of comb, so the necessity is obvious to save this precious commodity. Since the introduction of what is termed "Comb foundation" many difficult problems have been solved, such as, keeping the combs straight, enabling the bees with greater ease to build worker or drone cells at pleasure, and saving the time and honey formerly required in the making of comb. This invention has been claimed by Germans, English, Scotch, and Americans. During the last 20 years many minds were at work upon it, but the palm has at last been giving to Mr. A. Washburn, of Medina, Ohio, the inventor of the roller machine, which enables us to manufacture this material by the ton, and has put it within reach of all, as it is now a marketable commodity, and can be had from all dealers at very little over the cost of the wax.

PROFITABLE BEEKEEPING.

I now come to the class who might, if they would only try, keep bees with profit. Every cottager in suitable districts could pay a portion of his rent

from the great profit to be made from bees. They find their own food and only require a little attention. Beekeeping is specially adapted as a healthy, interesting and profitable employment for women and suited to their tastes and physical strength. I know a lady in Perthshire, who has managed a dozen hives for three or four years during the protracted illness of her husband with the greatest success; and the Stationmaster at Struan told me he would have left the service of the Highland Railway Co. long ago had it not been for his bees. One year with another he had received more from his bees than from the Railway Co. Then we have small farmers, who are often in the best districts for bees, who could if they wished add bee-farming to their other duties and make it pay well. Mr. Raitt who was formerly schoolmaster at Liff, began bee-farming at Blairgowrie some years ago, and he told me his income has increased every year since. The Messrs. McNally, of Glenluce, in Wigtonshire, are perhaps the greatest bee-farmers in Scotland, but, indeed, all that is wanted is to get men and women of our own country interested in this matter, as many in America, Germany, Switzerland, and France are, and we would then be in a position to supply ourselves, or even export honey instead of importing it in tons annually as I have shown you on former occasions.

HIVES.

The question of hives is such a broad one that I prefer to leave beginners in the hands of the various dealers, but will be happy to assist in any way I can, those who may think of making bee-keeping a study either as a hobby or for profit.

Glasgow.

PAPERS FOR BEGINNERS.

BY ROBERT GILLO.

(Continued from page 132.)

COLLECTING AND SETTING COLEOPTERA.

Undoubtedly most young Entomologists commence by collecting butterflies and moths, as these insects are, owing to their bright colours and larger size superficially more attractive, but some may perhaps choose the collection of beetles, or some entomologists of riper years may be about to take up this special branch of the study. With a view to assisting such, I venture to give some very simple and elementary information as to the collecting and setting of British Coleoptera.

First then, we will speak of the apparatus required. The most useful form of net is the ring net similar to that commonly used for butterflies, but much stronger. It should be made of iron wire, at least an eighth of an inch thick, and covered with strong cheese-cloth, the bag of which should be not nearly so deep as that used for Lepidoptera. It must be securely fixed to a strong stick about three feet long, and in this condition is very useful for sweeping banks, long grass, or herbage generally; if an additional length of stick is attached in some secure manner, it forms a very good water-net for collecting in ponds, the banks of streams, ditches, &c. The net has also another use, there are immense numbers of beetles that are found amongst debris of various kinds, and are very difficult to secure as they so easily hide themselves in the rubbish, but are readily secured if immediately on being observed they are thrown into the net together with some of the debris.

For receptacles in which to bring home the captures, bottles are generally preferred to boxes. One with a wide mouth and securely fitting cork, through which a piece of glass tube or a large quill has been passed, the tube should fit the cork tightly and project about an inch on the outside and a similar length on the inside, but not reaching to the bottom of the bottle will be found most useful, as all small beetles can be easily passed down the tube into the bottle but are not able to return, so that the collector can go on inserting fresh insects without the bother and annoyance of the others previously captured escaping. For greater safety when returning home, a plug of wood or paper may be inserted into the mouth of the tube. An ordinary sized pomatum bottle will be found very suitable, and a piece of glass tube about the size of an ordinary blacklead pencil, can be procured at any shop which supplies chemists' appliances. The hole through the cork is quickly made by simply pressing the end of the tube against the cork and at the same time turning it round, so that a collecting bottle of this description is very easily made.

The ground-beetles, soldier-beetles, and others being carnivorous, will attack and mutilate each other if placed together alive in the same receptacle. The larger species may be put separately into strong pill boxes, but the usual, and by far the best plan is to have a well-corked bottle, containing bruised laurel leaves, in which to place all such as are at all likely to fight. The fumes of the laurel will soon overpower any beetle, however large, but if greater rapidity of action is wished, a slip of paper can be inserted moistened with chloroform or ether; or instead of laurel leaves a few bits of rag moistened with common benzoline may be used, some collectors prefer this method for killing all the larger beetles. In addition to these bottles a few strong homœopathic pilule tubes for special captures and a few extra vial bottles will

be found very useful. A strong jack-knife for ripping off bark, and a small tin cannister will complete the outfit necessary for the ordinary run of collecting. Of course, special methods of collecting may require special apparatus, as for instance beating trees and hedges is an excellent way to get many species, and for this a beating net is required; if you can secure the assistance of a friend, a tablecloth with a stick run in the hem at each end answers capitally, or if you are alone an open umbrella, more especially if lined on the inside with white calico will be found most useful for catching the insects as they fall. Another simple but very useful tool is a small pointed garden trowel; a square of mackintosh to kneel upon when working in a damp place is also desirable, it is also convenient to put the rubbish containing beetles upon for examination, such as haystack refuse, dung, &c.

To the above must be added a pocket magnifying glass, as many beetles are too small to be examined with the unaided vision. The form of magnifying glass best suited for the purpose is that with three lenses of various powers shutting into a horn case.

Beetles are so numerous, and their habitats so various, that they may be said to occur almost everywhere under stones, and refuse of all kinds, in the dung of all animals, and on trees and herbage of every kind; some only on one special plant, others only in water, and so on, that collectors generally work out certain special lines and methods of collecting, according to the time at their disposal, the locality in which they may reside, or for many other reasons.

It is absolutely necessary that all the specimens should be *well* set. I feel sure that it is more important to impress this fact upon the minds of young collectors in reference to beetles, that it is with respect to butterflies and moths. The lepidoptera being large and generally recognised at once, the interest of the collector is aroused to set them as well as he can, but in the case of coleoptera the specimens and species are very numerous, often of small size, and easily captured, so that the collector catches and bottles up hundreds, perhaps thousands, of specimens; but he does not feel sufficient interest in them to work patiently for days at the setting of such an immense number of insects, about which he knows little or nothing, and has no idea whether they are common or rare, the result being, in the majority of cases, that he sets more or less imperfectly the larger and perhaps also some of the medium sized ones which are not difficult, whilst the smaller ones are kept for a time and eventually thrown away.

I cannot help repeating here what I said in an earlier paper of this series, that to catch insects and then not take the trouble to set them as perfectly as possible is nothing less than wanton destruction, and cannot be too strongly

depreciated. I may mention the case of a young collector I once knew. As a collector in the field he was most energetic, working away and bottling up almost everything, but, of course, more particularly anything he had an idea was at all rare. The setting, however, was far too troublesome a matter for him, it took too much time, and required a greater amount of patience than he possessed, the result being that he set some of the ground-beetles and other easy ones in a hasty and untidy manner, whilst such as the Lady-cows he merely stuck on card without attempting to place the legs and antennæ in proper position, or at best only very imperfectly, in which condition the insects were of course spoilt and useless. On pointing this out to him, he said "Oh! I can't set those little things properly, they are far too difficult and take too much time." "Then," I said, "Unless you were able and intended to set them properly you should not have caught them."

I maintain, that before setting to work in earnest to collect any order of insects the student should learn to set them properly. Of course, a few of the more common species can be easily obtained for the purpose of practising setting, first selecting the larger species, and when able to do them efficiently trying some of the smaller and more difficult ones. As a guide to the way in which beetles should be set, young collectors cannot do better than look at any good illustrations, such as those in "Rye's British Beetles," or "Staveley's British Insects." It is usual to set beetles on card, except the larger ones, each specimen on a suitable card, having a space below the beetle, *i.e.* between the beetle and the end of the card, for the insertion of the pin. The specimens should be attached with gum-tragacanth, making the solution of which is a point to which some of those who set insects well attach great importance. The usual method is to place a few bits of the gum in a wide-mouthed bottle, and add just sufficient acetic acid to cover it; by the next day it will be swollen, when some water is added, and the whole stirred; in this way in a day or two a jelly-like mass results, to which a small quantity of gum arabic is usually added to increase its adhesiveness, but not sufficient to cause the gum to show on the cards, when thoroughly dissolved some anti-septic must be added, or it will become mouldy and useless—a drop or two of carbolic acid answers very well.

The beetles must be kept in the laurel leaves for a few days until they are nicely relaxed, some will require a longer time than others, but they must be in so limp a condition that when one is placed on its back, on a white cloth or rough white blotting paper, its legs and antennæ may be brushed out with a small paint brush—a sable brush is the best for this purpose. If the insects are in the proper condition this may be easily done, but if they are left too long in the laurel they get so very tender that the legs, &c., come off at the

slightest touch, in fact they become rotten and fall to pieces. The next step is to get the insect mounted on the card, which must be the finest Bristol-board of a thickness according to the size of the insect, it is a very convenient plan to have it cut into strips of suitable widths for use. Having selected the piece of card the first operation is to place a small dab of gum in the centre, and then to get the beetle turned over on to the card, if possible without displacing its wings, and then with the setting needle to place its legs, antennæ, and palpi accurately, for this operation a magnifying glass is often needed, and always so for the smaller ones; for this purpose nothing will be found so useful as a watchmaker's eye-glass set in a cork frame, not in horn as they usually are, as cork is so much lighter and easier to hold in the eye. A very little practice will enable any one to hold it in his eye, and the comfort and advantage gained by using such, in preference to a hand-glass is great, as both hands are free, one to hold the insect, whilst with the other you are arranging its legs, &c.

The setting needles are merely good strong sewing needles driven into a stick or penholder for a handle. One of these needles should have the extreme tip hooked, for drawing out a leg that is retracted, or for any similar purpose, a hook is easily made by heating the tip of a needle in the gas or candle and bending it with the pliers whilst hot. The rest of the process depends upon practice, for it cannot be denied that some species of beetles are very difficult to set, those with short legs, and those which are of a more or less globular form are perhaps the worst. There is another method and I think a better one than that just described, namely to set them at once with hot common glue, immediately they are killed in boiling water, or if more convenient after they have been in the laurel bottle. The glue should be kept warm in a child's food warmer or other similar arrangement, the thickness of the glue is a matter of experience, but it will be found that the larger ones will require it thicker than the smaller ones. They may be set on any old or dirty card so long as it is not thin, or it curls up as the glue dries. Having mounted, or rather set them in this way, which with a little practice will be found very easy, as the glue holds them firmly when once placed in position, so that it is a far less difficult and delicate operation than with the gum, they may be dated and marked with locality, and put aside until a leisure time turns up for examination and permanent remounting on Bristol-board.

The plan I have just described was introduced by Dr. Ellis and Mr. Smedley (of Liverpool), and I think all coleopterists owe them a debt of gratitude for publishing the method. It is an immense advantage when dealing with the Rove and Cock-tail beetles (*Brachelytra*), and all soft-bodied species, as if set with gum they twist and shrink up, owing to the contraction of the

body during the drying, but if glue is used the body is firmly held in position until the whole is dry and rigid. Mr. Keys, of Plymouth, has suggested that instead of hot glue I should use glue dissolved in acetic acid, which saves the bother of heating and is always ready to hand. The best Russian glue must be used, and allowed plenty of time to dissolve without heat. In this way it can be prepared of any thickness. It will be an advantage to have two bottles of glue solution, one much thicker than the other, so that the exact thickness of glue can be obtained to suit the requirements of any particular insect. There are many incidental advantages attending the plan of setting beetles with glue. For instance, a large number taken at the same place and under similar conditions, can be set on the same piece of card, and a note written on it giving date and locality, containing all the information it is necessary to know. But if the insects are set on separate cards, either each card must be dated and marked with locality, or it must be numbered so as to refer to a catalogue, which must also be kept containing the particulars of capture, &c. This will take so much time and be so troublesome that young collectors are certain not to follow it, and yet is of the utmost importance that they should know beyond a doubt where and when each specimen was taken, for it may often happen that amongst their captures some new or very rare species will be found, and which, of course, they have not sufficient knowledge and experience to recognise at the time.

Again, the number of insects taken on a day's collecting in a good locality is so large that it is not possible to set them all, and it would consume far too much time to examine each one in the field, so as only to bring home what are required, and the collector would not know them all, even if he looked at each with a magnifying glass, but when he has them at home laid out on blotting paper he would be able to recognise some at once, these he would set if he required them, and if not they would be passed to one side; any that appeared to be new he would, of course, set, but the determining the species, which takes time and is attended with some little difficulty, would be left for a future time. All those not required need not be thrown away, but may be put into weak spirit, that is methylated spirit to which an equal bulk of water has been added. In buying methylated spirit be sure you are not supplied with methylated finish, which is often sold for spirit, as it contains some gum or resin, and when water is mixed with it the gum is precipitated and the fluid looks milky. If undiluted methylated spirit is used it will harden and stiffen the insects so much that they cannot afterwards be set, but in weak spirit they will keep for years, in nearly their original condition, and may be mounted at any time.

At a leisure time or during the winter months when collecting cannot be

actively followed, the insects which have been set with glue can be carefully examined and named, and specimens may be selected from them for remounting for the collection, selecting such as are perfect and as far as possible typical forms or peculiar varieties. The remounting is a very easy operation, it is merely necessary to throw the card with the beetle glued to it into warm water, when in a short time the beetle will float off and may be lifted out with a strip of blotting paper, which should be done quickly before the legs of the insect become relaxed and out of place. No difficulty will be found in mounting the beetle on clean Bristol-board, with gum tragacanth prepared *without* any gum arabic, as the legs, &c., are already fixed in their proper position, or should they not be exactly right, a little adjusting with the setting needle is all that will be required.

The largest beetles, such as the cockchafer, and others about the same size are not generally placed on cards, but are pinned through the right elytron. For setting such beetles a cork setting-board will be needed, which should be of such a form that the portion of the pin which passes through the beetle may be half-an-inch long, from the underside to the point of the pin, so that when the beetle is placed in the cabinet it may be well up out of the way of mites. It is, of course important that all the specimens should have the same length of pin, so that they may be of the same uniform height.

It will be seen by the foregoing hints, that to become an entomologist and acquire an interesting and valuable collection, requires something more than the mere collecting in the field, and that a certain amount of patient labour and application is necessary. To those who are not prepared to give the study their earnest attention, and devout as much of their time to it as they are able, I would say give it up and take to collecting stamps or some other amusement. But to the patient worker, I say emphatically that the labour is not so arduous as at first appears, the finding fresh species of insects, the continual acquirement of more knowledge concerning them, and the world of inexhaustable variety and beauty, which is gradually unfolded to the mind of the industrious student of nature, more than repays him for the expenditure of any amount of trouble or time, and I think renders his life more happy and enjoyable than that of most men.

(To be continued.)

A DAY'S "SCIENTIFIC" INSECT-HUNTING ON
THE ISLE OF MAN IN JUNE.

BY C. S. GREGSON.

First, let me define what I mean by the term "Scientific Insect-hunting." Decide where you intend to work, how long you intend to work, and what species known to occur in the district you intend to work for. It is generally said by collectors who have often worked on the Isle of Man, that it is a grand place for two or three species, all of which can only be got at dusk, whilst the whole of the day is a blank. There is just a little truth in this as a general rule, because most of the Manx insects are such as are common everywhere, commoner at home than on the Isle of Man, but there is a fallacy underlining the idea nevertheless, and with the permission of the Editor of the *Young Naturalist*, I will try to shew how fully and how profitably the day may be spent there, by such as will work scientifically, and who will use their wits, and give a certain time to the place, and how to obtain insects they have decided to work for. To run here and there after moths (often myths) said to have been taken yonder, is a mistake young naturalists should avoid; choose your ground and work it out, and the time out, which you have set yourself, and astonishing results will follow. Very often the species usually thought exclusively attached to ground some miles away, will turn up in plenty close at home, the unexpected always happens! It must also be borne in mind that many species fly twice a day, and can only be found accidentally, except during their time of flight. Knowing these things, of course, facilitates the results you have in view, but if you do not know them, then there is all the more reason that you should utilize the whole of the day-light to secure the species which fly early, at noon, or at dusk. To illustrate my meaning, I will give you an actual day's work of what I call scientific collecting in the Isle of Man, in June (Jubilee morning), commencing at 5 a.m. On the rocks, *S. irrorella* was flying in plenty, I secured 7 females and all the males I wished before 7 o'clock, and *T. filipendula* was flying in hundreds, waving backwards and forwards over the herbage growing on the slopes, but now I am amongst the roses, *Rosa spinosissima* and *Incurvaria canariella* is on the wing, this species flies again at 5 p.m., yet it is very rarely taken by amateur collectors, because at 7 a.m. they are not out of the house, and at 5 p.m. most of them have gone in to tea! at other times it is only possible to smoke them out, and this is dangerous work in such dry ground as the roses frequently grow in. At 8 o'clock my time was up, I set my best captures, and got breakfast before 9.30 for train to Castletown, for "Scarlet" Rocks, where I decided to work

the day, reaching "Scarlet" at 11 a m., I commence sweeping *Thymus sypyllus* for *Gelechia distinctella*, the first sweep gave me a pair of *Butalis fuscoaniella* and soon afterwards the objects of my search *G. distinctella* and *Phycis subornatella* were netted, then sweeping some stunted *Lotus corniculatus*, *Butalis fuscocruprella* was freely got, mixed with other species I did not want. Having secured plenty of the above I next turned my attention to the *Lichen geographicus*, growing on the large blocks of Trap rock laying about, and found the larva of *Eudorea lineolalis* in plenty, leaning over these great lumps of Igneous rocks was hot work, the grand old sun blazing fiercely down into the hollow ground I was being baked in, led me to suggest a change, stripping, I plunged into the sea (hissing hot), for a swim round the "South Stack," a great isolated rock which stands at the extreme point of Scarlet rocks. After this refreshing swim I turned my attention to the larvæ of *Sciophila colquhounana* which were very scarce, but in searching for them I found another *Sciophila* in pupa, this I have found before but never bred it, the larva and pupa are much smaller and lighter coloured than *Colquhounana*, but the larva feed and live in exactly the sort of, shall I call it a silken bag open at both ends. But now I have exhausted every workable plant I can find, so turn to hunting for and gathering the pupa of *Sesia musciformis*, this species is just being gathered in the island, in all localities which can be easily got at it is already cleared out, of course there are ungetatable places where it can set the pot-hunting collector at defiance, and so continue its time upon the island. The most unfortunate thing for the pot-hunters is they cannot breed many out, because they are not naturalists, so never think how to treat them. Naturally, the whole of the rocks, &c., on the ground I have been working upon for these species being used up, I go further and fare worse. Commencing to sweep *Statice armeria* flowers on a most charming locality I have chosen, I am soon made aware something is wrong with a large lot of cattle in the field, and one "father of cows" is heading my way. The rocks here lay low from the land to high-water mark; not feeling like taking a bull by the horns, I skipped off to a higher rock, mounting it I climbed the wall which crossed it, dividing the field from the ground I had been working before, and felt more comfortable as I turned to larva hunting where I knew the bull could not come. On the tops of, and in the crannies about the rocks on this ground, small stunted plants of *Selene maritima*, *Plantago maritima*, and *Satice armeria* grow, and to these I paid most attention, leaving the *Poa cespitosa* and *cerulea* almost untouched, but every plant of the first three species were examined, and every hole or chink in the rocks near them. No slipping this little plant for yon larger one, clear all before you, and slowly but surely you will secure all there is upon the land

which can be found. Working in this way I took four *Polia nigrocincta* larvæ, five *Dianthecia cæsia* larvæ, one *D. conspersa* larva, and quite a lot of *D. capsophila* larvæ; the latter remain in the capsules of the flowers during the day, and are easily gathered with the flowers, but *cæsia* and *conspersa* larvæ do not, and required to be searched for in holes and nicks in the rocks, and to be tickled out with a grass stem, &c. Mind you don't tickle them deeper into the fissure! Turning from flowers to grass, I got two pupa of *Agrotis lucerneæ* (since emerged), several full-fed larvæ of *Luperina testacea*; these had fed upon and at the roots of *Aira cespitosa*, hitherto I had always found it at the roots of *Holcus mollis*, or at the roots of *Dactylus glomeratus*, where it makes a large bed of frass. Of *Luperina cespitis* I took two larvæ half-fed, and amongst these grass tufts were no end of pupa cases of *Hepialus velleda* sticking out, but not one pupa could I find, all had emmerged. But now I am hungry, thirsty, and tired, but I have not completed the work I laid out,—I yet wanted some larvæ of *Depressaria alstræmeriella* which I got on the *Conium maculatum*, which grows freely on the shore between the lime quarry and Castletown; and a lot of *Eubolia cervinata* which feeds in plenty on the mallows (*Althæa officinalis* and *Malva sylvestris*), growing on the shingle and along the walls. It will thus be seen that the collector who goes scientifically to work has plenty to do during the day-time at the Isle of Man.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

(Continued from page 102.)

Pissodes notatus is a recent acquisition to Chat Moss, although it is now abundant on the western end. The larva feeds beneath the bark of *Pinus sylvestris*, especially on the trunk and large branches, where it eats numerous galleries which prevent the sap from rising. It may be detected by the holes in the bark, from which the beetle has emerged, and by the leaves being yellow. The larva when full-fed makes a cocoon of wood, frass, &c., in which it changes to a pupa, and eventually a beetle. The perfect insect may be shaken into an umbrella, by beating the branches with a walking stick. This species has destroyed a considerable number of trees on the western part of Chat Moss.

Pissodes pini is found in Scotland, where the larva feeds between the bark and the solid timber of recently-cut pine trees. If careful observation

were made, it would very probably be found as destructive to living trees as the preceding species.

Brachonyx indigena is, I believe, destructive to fir trees in Scotland.

Phlœophagus æneopiceus feeds beneath the bark of the ivy, when decayed, at Barmouth.

Rhyncolus lignarius feeds on rotten ash at Vale Crucus Abbey, Llangollen.

Mesites tardii lives in the wood of Ash trees at Killarney.

Cryptorrhyncus lapathi resides in all its states in willows, the larva bores into the trunk, from which proceeds a great quantity of frass resembling sawdust. It occurs at Blackpool.

Hylastes ater is destructive to pines and larch, especially when these have been injured.

H. opacus is of similar habits.

H. palliatus similar, but more abundant, forming galleries and chambers in which there are sometimes a dozen or more specimens.

H. trifolii. The larva and perfect insect are under the bark of gorse or whin. It occurs at the Isle of Man.

Hylurgus piniperda feeds in the young shoots of *Pinus sylvestris*, sometimes in the trunks of living trees: it betrays itself in the latter by light coloured spots of resin, which exudes from the bark where it has been feeding, with a hole in the centre through which the beetle has emerged. It is really astonishing, considering the abundance of this species, and its preference of feeding in young shoots, how it is possible for any trees to grow that are not bush-headed. This insect is very destructive on the Continent.

H. hederæ is a very much smaller and lighter coloured insect than the preceding, and much rarer. It feeds beneath the bark of the ivy in Dunham Park.

Phlœphthorus rhododactylus is a very small species which feeds under the bark of the broom.

Hylesinus crenatus. A small brown species, feeding in ash trees, the perfect insects make a burrow beneath the bark of the tree where their deposit their ova; the larva feed under the bark, it may easily be found by the great number of recently bored holes in the bark about the size of a pellet.

H. fraxini is a species which is very destructive to ash trees. The perfect insect bores its burrows into and under the bark, where it deposits its eggs on each side of its burrow. The larva feed at almost right angles from the burrow of the parent beetle, and it is from this habit of always engraving

this kind of pattern in their devastation, that some of them are termed Typographers. It is scarcely possible to examine an ash tree, which is cut down or damaged by lightning or storms, without finding traces of this insect. Thousands of trees have been killed by this species. It is an almost invariable rule that the female may be found dead in the burrow in which it had deposited its ova. Living trees, which have been attacked by this species, are often attacked by **Sinodendron cylindricum** and **Melandrya caraboides**, which complete the destruction. The latter species is very variable in size (as are most wood feeders), it is blue or greenish-black and shining. These insects feed in the decayed wood, also feeds on alder, birch, willow, &c.

Hylexinus vittatus a small species, is frequently found under the bark of elm rails, it makes labyrinth-like passages in which the larva have fed.

Scolytus ratzeburgi, this species is entirely black, it occurs in Scotland, and feeds under the bark of birch.

Scolytus destructor one of the most destructive insects to elm trees in Britain, annually destroying many trees, and the injury is gradually spreading, the beetles attack the trees by eating burrows in the bark, the females deposit ova in the burrows, the larva make galleries at right angles from the burrows of the females, and almost parallel to each other, under the bark. So great is the fecundity of this insects that their countless numbers soon destroy the largest trees. This species is abundant generally where elms abound, it is stated to be very abundant in the neighbourhood of London, and its ravages are so great as to endanger the growth of this tree. I believe this species infested some large elms in Hyde Park which were spoke-shaved so as to expose the larva. The above method succeeded, and the trees are recovering from the above treatment, and the insects are destroyed.

Scolytus pruni, this insect feeds under the bark of the plum tree, its habits are similar to *S. destructor*, and no doubt the insect is abundant, but orchards are not always accessible to the entomologist. I saw one tree very much infested with it at Urmston, and one at Lindow, where, in passing through a farm-yard, wherein was a quantity of felled trees and prunings, portions of fruit trees, &c., on which I was using a bark knife, when the owner of the material arrived, and after a little explanation he kindly directed me to what had been a plum tree, which I found was very much infested with these insects, I immediately inserted the bark knife under the bark and was tearing some off, when a lady I had not previously seen, demanded to know what the old plum tree had done to me, of course I apologised, and she saw how matters stood.

Scolytus intricatus infest the oak. The female bores a burrow under the bark, especially in the minor branches, where she deposits her ova. The larva makes burrows in various directions under the bark, thus obstructing the flow of sap. It sometimes destroys young trees, but oftener the branches of old trees, although I have seen trees in Dunham Park, which were destroyed by this insect, from six to eight inches in diameter. When first I met with this species it was in the branch of an oak in Dunham Park. The larva were feeding under the bark, and I tried to cut a short piece of it, but not succeeding I conveyed it to my home, and from it I reared about sixty specimens. It was then new to this district.

Scolytus rugulosus infest the apple tree, the larvæ feed under the bark, it is a destructive species, although I have very seldom met with it in this neighbourhood, all the *Scolytus* feed partly in the bark and partly in the wood, thus cutting off the supply of sap.

Scolytus multistriatus also infest the elm, they feed in a similar way to the other species, I have seldom taken this species, although it is very abundant in some localities, from where I have received it from Mr. Chapman.

Trypodendron domesticum attacks the bark of the beech, in Dunham Park I have often found the perfect insect eating its way into the bark and wood.

Trypodendron quercus is found in oak in Sherwood Forest, in which the larva feed.

T. lineatum is often found protruding from the burrows. It makes burrows in pine trees in Scotland, it bores into the solid wood of recently cut pines.

Cryphalus binodulus infest the minor branches of poplar. It feeds under the bark, often of decayed branches, but perhaps they are the cause of the decay.

Dryocætes villosus infest oak trees. It feeds under the bark, and in it when the trees are large. It makes numbers of winding galleries. It is often found in trees which are infested with *Bogous ligniperda*.

Dryocætes bulmerinqui feed beneath the bark of the alder. It is a very small species, and easily overlooked. Its presence may be detected by the numerous small round holes in the bark of decayed trees, from which the perfect insect has emerged, after completing the destruction commenced by larger insects. It is very local, and has only been found in Drinkwaters Clough, Agercraft, and on the banks of the Bollin above Wilmslow. This species was discovered by Messrs. Morley and Broadhurst, and added to the British list about 20 years ago.

Tomicus sexdentatus is the largest of the British species of *Scolytidae*. It is extremely rare in Britain, if it remains so it will be well, as it is a very destructive insect to pines. It completely undermines the bark with its numerous galleries. I met with this species some years since in pine props at a Dakinfield coal-pit.

Tomicus typographus is also very destructive to pines. It is very rare in Britain. In Germany the great pine forests are in certain seasons very much damaged by the larvæ of this insect which feed beneath the bark. The evil is occasionally so great that prayers are offered up in the churches against its extension. In 1873, the number of trees destroyed in the Hartz forest alone, amounted to a million and a half.

Tomicus acuminatus feeds under the bark of the pine, it is very rare, I have only met with one of this species near Manchester.

Tomicus laticis feeds in larch trees, filling the bark with its numerous perforations, beneath which the larvæ have fed, it is a common and destructive insect, it also feeds beneath the bark of the pine.

Tomicus bidentatus is very destructive to the minor branches of pines, it is very probably the cause of the numerous dead branches.

Platypus cylindrus is found chiefly in the New Forest, its larvæ feed in the solid wood of the oak. It is perhaps not as destructive as those species that feed just beneath the bark, as by that means they cut off the supply of sap.

(To be continued.)

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 6, 1887.—Dr. D. SHARP, F.Z.S., President in the chair.

The Rev. W. T. H. Newman, M.A., 11, Park Terrace, The Crescent, Oxford, was elected a Fellow of the Society.

Mr. M'Lachlan remarked that at the meeting of the Society in October, 1886, he exhibited a quantity of the so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*, Westw. The seeds have long ceased to "jump," which proved that the larvæ were either dead, had become quiescent, or had pupated; about a fortnight ago he opened one of the seeds, and found therein a living pupa. On the 4th inst. a moth (exhibited) was produced.

The President, on behalf of the Rev. H. S. Gorham, exhibited the following Coleoptera, lately taken in the New Forest:—*Anoplodera sexguttata*, Fab., wholly black variety; *Grammoptera analis*, Fab.; *Colydium elongatum*, Fab.; and a specimen of *Tachinus elongatus*, Gyll., with brownish-red elytra.

Mr. S. Stevens exhibited a specimen of *Orsodacna humeralis*, Latr. (*lineola* Panz. var.) taken by him at Norwood; he also exhibited a specimen of the same beetle taken by him fifty years ago in Coombe Wood; during the interval he had never seen it alive.

Mr. G. T. Porritt exhibited, on behalf of Mr. N. F. Dobrée, of Beverley, a series of about thirty specimens of a *Tenioecampa* he had received from Hampshire, which had previously been referred to as a red form of *T. gracilis*. Mr. Dobrée was inclined to think they were not that species, but *T. stabilis*.

Mr. A. C. Horner exhibited the following species of Coleoptera from the neighbourhood of Tonbridge:—*Compsochilus palpalis*, Esp. (5); *Acrognathus mandibularis*, Gyll. (4); *Homalota atrata*, Mann., *H. vilis*, Er., and *H. difficilis*, Bris.; *Calodera rubens*, Er.; and *Oxytelus fulvipes*, Er. He also exhibited a *Rhizophagus* from Sherwood Forest, which appeared to belong to a new species; and several specimens of *Holopedina polypori*, Först., also from Sherwood Forest, where he had found in company with, and probably parasitic on, *Cis vestitus*.

Mr. Elisha exhibited two larvæ of *Zelleria hepariella*, Stn.

Mr. Stainton remarked that as the greater part of the larvæ of *Zelleria* were attached to the Oleaceæ, it seemed strange that certain species had recently been found on Saxifrage.

Mr. Slater read a paper on "The presence of Tannin in certain Insects, and its influence on their colours." He mentioned the facts that tannin was certainly present in the tissues of the leaf, wood, and bark-eating species, but not in the tissues of the carnivorous beetles, and that black colour on the elytra of certain beetles appeared to be produced by the action of iron on tannin. A discussion ensued, in which Prof. Meldola, Mr. Poulton, Dr. Sharp, and others took part.—W. W. FOWLER, Hon. Sec.

HAGGERSTON ENTOMOLOGICAL SOCIETY.

June 23rd, 1887.—Mr. Hockett, Vice-President, in the chair. Mr. Hanes exhibited a fine specimen of *S. ligustri*; Mr. Harper bred specimen of *D. irregularis*; Mr. Hockett living specimens of *S. ocellatus*, *C. elpenor*, *A. grossulariata*, *M. rubiginata*; Mr. Clark, specimens of *C. plantagininus* and *A. grossulariata*, bred that day.

June 30th.—Mr. Hockett, Vice-President, in the chair. There was a

large attendance of members, and amongst others the following were exhibited: Mr. Hockett, *D. irregularis*, *H. hymiaria*, *P. bajularia*, bred; Mr. Hanes, fine series of *X. rurea*, bred; Mr. Harper, *S. tipuliformis* and pupa case on twig; Mr. Clark, fine specimen of *Necrophorus vespilo*; Mr. Anderson, series of bred *A. prunaria*. Mr. Lewcock stated that a few days previous he had taken *Chryptocephalus lineola*, *Luperus betrilinus*, *Donacia menyanthidis*, *D. thallasina*, *D. sericea*, *D. cernari*, *Orchestes quercus*, *Elaphrus cupreus*, and *Auchomenes gracilis*. Mr. Russell stated that he had been to Reigate, and had seen *L. alsus* and *L. adonis* in great profusion, also other species.

July 7th.—Mr. Hockett, Vice-President, in the chair. This evening there being a very large number of exhibitions, no discussion on the life history of Macro-Lepidoptera took place, the following were amongst a few of the exhibits: Mr. Hockett, *P. bajularia*, *C. propugnata*, *M. rubiginata*, *A. luteata*, *H. hectus*; Mr. Anderson, a series of *B. repandata*, bred; Mr. Sampson, *Z. æsculi*, *N. sambucata*, *C. caja*, *P. bucephala*; Mr. Harper, *Z. æsculi*, living specimens; Mr. Lewcock, *Lebia chlorocephala*, *Hypulus quercinus*, spec. of *Bruchida*, *Tanymercus palliatus*, *Ceuth. campestris*, *R. puaxillus*, *Rhynchites æneovirens*, *Cneorhinus exaratus*, fine series of *Malachius æneus*, *M. viridis*, *Clytus mysticus*, *Alophus triguttatus*, *Orobites cyaneus*, *Harpalus ignarus*; Mr. Clark series of *E. Haworthii*, fine melanic var. of *H. abruptaria*, *R. tenebrosa*, living larvæ of *C. nupta*; Mr. Pearson, *S. tilia*, *C. elpenor*.

July 14th.—Mr. Hockett, Vice-President, in the chair. There was a large attendance of members, and the exhibition very good. Mr. Hockett, an extra good selection of this years breeding of *A. grossulariata*, including fine varieties, some very much suffused and others nearly white; Mr. Hanes, series of *L. sibylla* from the New Forest, also living larvæ of *M. fuciformis*, &c.; Mr. Franklin fine vars. of *A. grossulariata*; Mr. Harper, *Consignata*, &c.; Mr. Lusby, *H. serena*, *D. irregularis*, *S. myopiformis*, &c.; Mr. Clark, very fine vars. of *A. grossulariata*. Mr. Hanes had been to the New Forest and found the usual species of Diurni very common, larvæ plentiful, but night collecting seemed to be a failure. Mr. Harper drew the attention of the members to the numerous traces of the *Sesia* this season; *S. tipuliformis* swarming, *Z. æsculi* more common than it had been for 20 years.

The Secretary, on behalf of Mr. Robson, of Hartlepool, read a very interesting account of his experience with *L. alsus*, and the habits of this species, which caused a considerable amount of discussion. Mr. Russell said that a few weeks previously he had seen the female *L. alsus* ovipositing on the vetch, also at the same time and almost the same place *L. adonis* was laying on the *Lotus corniculatus*. Mr. Clark had taken the species flying

over wild thyme at Box-hill, and at sugar. Mr. Hockett had taken them plentifully at Caterham, but always at the bottom of a slope, and in his opinion they were only single-brooded. Mr. Harper said that he had taken it at Folkestone and Caterham, and thought that it was a continuous brood. Mr. Clark said that in his experience they were only taken locally, and in some cases only in a small corner. Mr. Pearson drew the attention of the members to the *Geometræ*, in some cases they came out in the autumn, and others of a brood laid over till the next season, and he thought that perhaps it might be the same with *L. alsus*.—J. RUSSELL and E. ANDERSON, Joint Secretaries.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

June 23rd. 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Mr. Wellman exhibited bred examples of *Lobophora viretata*, Seb., from Burton-on-Trent. Mr. Oldham, a number of species from Epping Forest, including *Drepana lacertinaria*, L., *D. falcaturia*, L., *Notodonta dromedarius*, L., *Eurymene dolobraria*, L., and three specimens of *Chærocampa porcellus*, L., taken respectively at Theydon, Lords Bushes, and Loughton. Mr. Jager, *Erastria venustula*, Seb., received from Horsham, bred examples of *Eupithecia isogrammaria*, H.S., *E. tenuiata*, Hub., and *E. venosata*, Fb., the last mentioned having been two years in pupa. Mr. W. A. Pearce, *E. isogrammaria*, H.S., and *E. castigata*, Fb. Mr. Sheldon, bred examples of *Sesia culiciformis*, L. Dr. Rendall, *Heliaca tenebrata*, Scop., taken at Hounslow. Mr. Turner, living larvæ of *Cucullia verbasci*, L. Mr. West, of Greenwich, larvæ and cases of *Coleophora palliatella*, Zinck., and *C. currucipennella*, Fisch., the former found on oak at West Wickham, and the latter on oak, willow, and aspen.

July 14th.—The President in the chair. Dr. Rendall exhibited *Acidalia rubiginata*, Hufn., *A. marginepunctata*, Goze., *Eupithecia coronata*, Hub., *E. plumbeolata*, Haw., *Lithostege griseata*, Schiff., *Agrophila trabealis*, Scop., *Spilodes verticalis*, L., &c., all taken at Thetford. Mr. E. Joy, *Erastria venustula*, Fb., from Epping Forest. Mr. Wellman, *Dicranura furcula*, L. and *Eupithecia togata*, Hb., from Perth. Mr. Jager, *Dicranura bifida*, Hb., &c. Mr. J. T. Williams, *Heliothis dipsacea*, L., *Hydrelia uncula*, Clerck., from Suffolk. Mr. Tugwell, four varieties of the larvæ of *Cucullia chamomilla*, Schiff., ranging from white to pink, *Sesia sphegiformis*, Fb., and three specimens of *Dicranura bicuspis*, Bork., and two pupæ cases, one on the bark and the other on a twig of birch. Mr. Hall, *Spilosoma mendica*, Clerck., bred from ova. Mr. Adkin, *Notodonta trepida*, Esp. (bred). Mr.

Edwards, a variety of *Abraxas grossulariata*, L., the usual white ground colour being powdered over, giving it a deep grey appearance, the orange markings in the superior wings being very distinct. Mr. Baron also exhibited a variety of *A. grossulariata*. Mr. South, some interesting forms of *Lycæna icarus*, Rott., from the Isle of Wight, and called attention to a male with black spots on the hind-wings, which he had only seen before on specimens from Sligo, Ireland. Mr. Billups, *Xylocopa violacea*, L., and *X. latipes*, Drury., also *Taiscolia hæmorrhoidalis*, Fb., and read notes on his exhibit. Mr. Jenner Weir exhibited specimens of *Pieris oleracea*, Bois., from Hudson's Bay, and *P. napi*, L., and contributed some interesting remarks. Mr. Williams mentioned an instance of a species of wasp that had been observed to bring caterpillars into a room, and put them in the opening of a reel of cotton, fixed on a sewing machine, the wasp afterwards closing the aperture. Mr. Billups observed that it was a well-known habit of the wasps to store caterpillars in openings, which they closed up with mortar. Mr. Billups called attention to the fact that in the neighbourhood of Essex Marshes, the cabbages were utterly destroyed by the larvæ of *Pieris brassicæ*, which this season was very abundant.—H. W. BARBER, Hon. Sec.

EDITOR'S CHAT.

NAMES AND AUTHORITIES.

I am asked an important question with regard to nomenclature, that had better be answered under this head than privately. The question is "Is it correct to write *Papilio machaon* in reference to our Swallow-tailed butterfly, or *Papilio machaon*, Linn.?" Unquestionably, it is correct to say or write *Papilio machaon*, when you are speaking of the butterfly in an ordinary way. *Papilio machaon* is the name of the species, the contraction "Linn" only refers to the author who gave it the name, and should only be used in a synonymic list, when the nomenclature is under consideration, or in critical dissertations. It so happens that Linnæus gave and used the name *Papilio machaon*, but if we take another species it is not so. Say *Pieris brassicæ*, and you are correct; say *Pieris brassicæ*, Linn., and you are wrong, for the name *Pieris* was never given or used by Linnæus at all, who called all the butterflies *Papilio*. In a list these species stand—

PAPILIO, Linn.

Machaon, Linn.

PIERIS, Shrank.

Brassicæ, Linn.

But when the generic and specific names are used in ordinary writing or speaking, it seems as incorrect to say *Pieris brassicae*, Linn, as *Pieris brassicae*, Shrank.

I am also asked to give the rule for the use of the capital letters to the specific name. This I cannot do for there is no rule. Insects named after persons, as *Haworthii*, or places as *Hethlandica*, appears to require a capital in any case. I generally use the capital myself when I omit the generic name.

NOTES AND OBSERVATIONS.

LAPISMA SACCHARINA.—I have read the notes on *Lapisma saccharina* in your June number, I may say I have noticed the insect (which we always called Silver insect) for more than forty years, but always on the kitchen hearth, on in a warm closet near the kitchen fire. It has always been a china closet, but whether the china or the warmth has the attraction I could not say. We have frequently watched them running about the kitchen hearth, and once when a box was left unmoved for some time near the fire we found them swarming underneath. I may say I have been in four or five houses in that time, but never seen them in any other part of any of the houses. Having noticed them for so many years, I have been much surprised to find there are people who have never seen such things. I have often wondered and should like to know what they fed on. None of the kitchens were cellared, so that when your correspondent's experience shows that they breed in damp places, mine has been just the opposite, warmth and dryness.—ISABEL ROBSON, Stockton-on-Tees.

EXCHANGE.

DUPLICATES—*Imbutata*, *Haworthii*, *Cambricaria*, *Filigramaria*, *Pulchelata*, and many others. DESIDERATA—many local species, accepted offers answered.—J. W. BALDWIN, 38, Dunscar Road, near Bolton, Lancashire.

Wanted *Abraaxas ulmata* from different localities. I will give a good return.—JOHN E. ROBSON, Hartlepool.

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A FORTNIGHT'S COLLECTING IN ARRAN.

By A. ADIE DALGLISH.

NEVER in my experience of collecting, have I enjoyed so pleasant a fortnight, as that which I spent in Arran this summer; the weather was all that could be desired, and the same may apply to the insects.

I was staying at Corrie, a pretty little village, situated in the north-east of the Island, seven miles from Brodick, and about a mile and a half from Glen Sannox, famous for its wild and picturesque scenery. The mountains are composed of granite, rising into pinnacles of grotesque forms, and towards the summit they are either destitute of vegetation or invested only with a slight covering of Alpine plants and mosses.

I arrived there on the 2nd July, after having had about four hours journey from Glasgow, by rail, boat, and coach, amidst a downpour of rain, which did not look very promising to begin my holidays; however, in the afternoon it cleared up a little, and being rather inquisitive to know what was to be had, I put some boxes in my pocket and went to examine a few trunks, from which I took *Venusia cambricaria*, *Larentia cæsiata*, *Ephyra pendularia* (one), *Cidaria russata*, *C. corylata*, and *Boarmia rhomboidaria*, also one of *Phlogophora meticulosa* sitting on a grass stem, the tips of both its upper wings were gone, but otherwise it was in very fair condition. In the evening I went up to the moor, which was a stiff climb for over half-an-hour, through wet heather and brackens; here I took four *Acidalia fumata*, a few *Eupithecia satyrata*, one *Cidaria silaceata*, two *Platypteryx lacertula*, two nice specimens of *Melanippe hastata* shaken from the birch, *Larentia pectinitaria*, *L. didymata*, *Cabera pusaria*, *Melanthia ocellata*, *Metrocampa margaritata*, *Agrotis porphyrea*, *Eubolia palumbaria*, *Melanippe montanata*, *Camptogramma bilineata*, *Crambus pratellus*, *C. margaritellus*, *C. tristellus*, *C. culmellus*, and *Hypermeccia angustana*, were common.

Monday turning out a fine day I went to Glen Sannox. Took one *Anarta myrtilli* flying in the sunshine, rather badly worn; a few *Eupithecia nanata* and *Larentia casiata*; *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Satyrus janira*, *Chortobius pamphilus*, and *Lycæna alexis* were very common; a few specimens of *Argynnis aglaia* were flying about and resting on thistles, and on the heather in bloom. In the evening I visited the moor between North and South Sannox, here *Hepialus hectus* was swarming at the brackens, boxing some nice varieties, I entered the wood, *Melanippe substristata* and *Rumia crataegata* were exceedingly common; I also took two nice types of *Cidaria russata*, one *Acidalia fumata*, a few *Coremia propugnata*, *Agrotis porphyrea*, *Cidaria silaceata*, and one *Aplecta nebulosa*, which I boxed from the wall round the wood.

Tuesday. I added nothing new to my captures but *Miana arcuosa*, *Leucania impura*, and *Pyraustra purpuralis*.

Wednesday was a fine sunny day, with a cool north wind blowing. I revisited Glen Sannox, where I took three *Melanippe hastata*, and a few *Venusia cambricaria*, *Acidalia fumata*, and *Cidaria russata*. In the evening a beautiful specimen of *Geometra papilionaria* was boxed from a grass stem, it appeared as if it had just emerged, and was very deep in colour; a fine specimen of *Notodonta dromedarius* was boxed in the same manner, also another type of *Platypteryx lacertula*, these were taken in the wood between Corrie and Sannox. On the moor a very strong wind was blowing, notwithstanding a good few of *Cidaria russata*, *C. prunata*, *Melanippe hastata*, *Acidalia fumata*, and *Melanthia rubiginata* were taken.

Friday. I returned to Glen Sannox. In the pretty little lane leading up to the glen I took a specimen of *Vanessa urticæ*, saw one of *V. atalanta*, and boxed two nice specimens of *Coremia propugnata*. I went to Sannox wood at night, took one of *Noctua brunnea*, two *Cidaria populata* (black variety), *Acidalia aversata*, *A. fumata*, and many others before mentioned.

Saturday forenoon I searched some trunks and took a good number of *Venusia cambricaria*; this moth seems to fly very seldom, even at night, but I could take it commonly sitting on the smooth white bark of the birch. In the afternoon I went to North Glen Sannox. When crossing the moor I took a specimen of *Plusia gamma*, and on a rocky bank at the foot of the glen *Satyrus semele* was very common. I boxed a nice series, also a fine specimen of *Argynnis aglaia*. In the evening I shook a specimen of *Cymatophora duplaris* from a birch, also one of *Eupithecia satyrata*, and two specimens of *Abrostola urticæ*, which I netted in the lane at Sannox.

Monday. I went to get a few more *Venusia cambricaria*, took another nice specimen of *Melanippe hastata*, also a fine type of *Plusia V-aureum*

flying in the sunshine, on the moor at North Sannox. Two or three others rose at my feet, but owing to the strong wind that was blowing I was unable to catch them. In the evening I tried sugaring, but not with much success, the only insects that visited it were a few *Xylophasia polyodon*, *Aplecta nebulosa*, and a worn specimen of *Thyatira batis*. I also took with my net *Acidalia aversata*, *Cidaria fulvata*, *Emmelesia albulata*, *Herbula cespitalis*, *Pterophorus trigonodactylus*, and two good specimens of *Pelurga comitata*.

On Tuesday I boxed a specimen of *Notodonta camelina* drying its wings on a fern.

Wednesday was rather showery, and a strong wind was blowing, which hindered me from collecting during the day. In the evening I took one of *Noctua c-nigrum*, two or three *Cymatophora duplaris*, and two nice specimens of *Anaitis plagiata*.

Thursday. I went to Glen Sannox, and took two specimens of *Argynnis aglaia*. On the moor above Corrie boxed a fine specimen of *Erebia blandina*. In the evening I took *Melanippe hastata*, *Cymatophora duplaris*, *Venusia cambricaria*, *Pelurga comitata*, *Acidalia aversata*, *Pterophorus ochrodactylus*, *Herbula cespitalis*, and another beautiful specimen of *Geometra papilionaria*, taken in the same manner as the last.

Friday morning I started early to look for *Erebia blandina*, making for the same place I had taken it before. I wandered about for some time, taking in my search five *Chortobius davus*, but no *blandina* could be seen. Just as I was thinking of giving it up as useless, I saw two butterflies about fifty yards away. I quickly made for the spot, and to my surprise, about a dozen *blandina* rose round about me, and at the first sweep I had four in my net. I then commenced to fill my boxes, which was not a difficult matter, as nearly every step I took, two or three appeared. I also netted three *Celæna Haworthii* flying in the sunshine, a few *Eupithecia nanata* and *Cidaria russata*, and in the evening took the usual variety.

On Saturday I took a few more *Blandina* at the same place; it seemed extremely local, as not a single specimen was to be seen on any other part of the moor, but these preferred fifty yards or so. I also took another *Argynnis aglaia*, and a few more *Chortobius davus*, two *Vanessa urticæ*, *Pterophorus bipunctidactylus*, *Scoparia dubitalis*, *Catoptria scopliana*, and *Tanagra chero-pyllata*. In the evening I went to the shore below the flag pole at Sannox, here *Hepialus sylvinus* was dashing about in its seldom ceasing flight, it was very difficult to catch, owing to so many brambles growing about the place, *Agrotis tritici*, *Noctua brunnea*, *N. baja*, *Apamea oculatea*, *Caradrina cubicularis*, *Noctua plecta*, and *Ypsipetis elutata* were common, and *Halia wavararia* occurred commonly on the currant bushes in the gardens,

Monday forenoon I boxed a fine specimen of *Notodonta dictæoides* off a birch. I left Corrie in the afternoon with much regret, but with the hope that I may return in another year to spend my holidays, roaming on the heather-clad hills and moors of this wild and beautiful island.

Pollokshields, Glasgow.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

(Continued from page 159.)

Prionus coriarius is one of the Longicornes or long-horned beetles. It is a large insect, almost resembling leather. These insects are found on bark of trees in woods, beneath which the females deposit their ova, by means of a strong, corneous, and tubular ovipositor, capable of being protruded to a considerable length. The larvæ reside in the interior of willow on which they feed; they form a cocoon with pieces of gnawed wood, &c. The perfect insect may be found on the trunks of trees during the day, it is usually met with when flying heavily, towards evening.

Aromia moschata (the Musk beetle). This species bears the appellation on account of its sweet smell, which is more like otto of roses than musk. It is often found on old willows, in which the larva feed on the solid wood. The scent is so strong as to be readily noticed at some distance, and is strongest in the female, which if put into a box or handkerchief will impart its aroma to them.

Callidium violaceum feeds under the bark of fir trees in Berkshire, making galleries. This insect was found very abundantly by the late Benjamin Cooke. It was formerly very rare in this country, but it is getting more common.

C. alni. All the longicornes are wood feeders. This species is common in some localities on dead twigs, in which they probably feed.

C. variabile feeds in old trees in Sherwood Forest. Is a variable species.

Hylotrupes bajulus is occasionally taken in the timber of houses, where its larva has been known to do considerable damage, even penetrating sheets of lead. It occurs near London.

Asemum striatum feeds on fresh-cut pine stumps in Scotland.

Clytus arcuatus feeds on old rails, posts, &c., at Epping, Newcastle, Cumberland, and Hertford.

C. arietis is found on rails, posts, &c., in which the larvæ feed. I have often found this species dead in old rails, with its head just out of its burrow.

C. mysticus feeds in rails, posts, and old hedges, in which the larvæ feed.

Gracilia minuta feeds in old woodwork, twigs, &c.

Lamia textor is found near Bristol and at Rannoch, on willow trees and in osier beds; it is frequently caught on the wing.

Monohammus sartor frequently occurs in Manchester and its suburbs, also in coal mines on the props which support the roof. I have bred this species from larvæ found in North American timber.

M. sutor frequently occurs in timber yards in Manchester and suburbs, and in coal mines, from whence I have obtained it.

Astinomus ædilis is conspicuous for the great length of its antennæ, in the male especially. This species occurs at Rannoch, where it is described by Mr. Rye as often seen flying across the glades of the Black Forest, with its antennæ streaming behind. It is often found on pine logs with its antennæ spread out like compasses, from which habit it is termed by the Highlanders "Timberman." If two males come within range they inevitably fight, for which reason it is difficult to obtain perfect specimens. This insect is often met with in coal-pits on the props, the larva and perfect insect are found under the bark of pine. Formerly this insect was considered very rare and readily sold at five shillings each. A descendant of Scotland, an entomologist, was dispatched to Rannoch from Warrington. He called at the woodcutter's house (who, I believe, sold these insects), when the woodcutter was absent from home. Being requested to leave his card, he stated it was of no consequence, he only wanted to know where the woodcutter got the Timberman, and received the required information, in addition to a number of specimens. The above information was given me by the late Mr. Samuel Carter. Mr. M. Ward and I obtained over 30 specimens of this insect in one day, on and under the bark of pine logs, at Astley deep pit, at Dukinfield. The logs were stated to have come from Scotland.

Mesosa nubila is said to feed in old oaks at New Forest, Bewdley Forest, Windsor, and Coombe wood.

Pogonocherus fasciculatus is found in cut branches of pine trees in Scotland.

P. hispidus and **dentatus** are found on branches of oak which have been recently broken and suspended from the tree.

Agapanthia lineatocollis is found on thistles at Whittlesea Fens; Monks Wood, Norfolk; and Weston, Oxon.

Saperda carcharias feeds in poplars and willows in fenny districts, often in pollards.

S. scalaris is a very beautiful insect. The larva feeds beneath the bark of alder and occasionally oak. It is very rare and local: it has often occurred in the neighbourhood of Manchester, which seems to be its favourite locality. Hobson used to get it in Mere Clough, afterwards a few specimens were captured by Mr. Joseph Sidebotham, accompanied by Crozier, at rest on the upper surface of the leaves. When the sun shone in the afternoon, they could see the insects through the leaves. Mr. Hewitt often told me, when I was a very young man, what a treat it was to capture this species, and often showed me specimens in his collection. It was then supposed to be extinct, however, some years afterwards, when Mr. Hewitt was gathered with the past, I was going through Drinkwaters Clough along with Mr. Kelsall, when I found a specimen of this insect on George Binks' coat. I acquainted them with my capture, and we immediately commenced operations with beating sticks and inverted umbrellas, we succeeded in finding a few more. A recently emerged female of this insect if pinned on a tree will attract the males. For a few years we procured a number of specimens, after which it seemed to again become extinct, although I found two pupa after its supposed extinction. Since then it has occurred at Middleton, but the wood where it occurred has since been cut down. It has also been captured at Sherwood, and Houghend Clough, and Rannoch. It is again supposed extinct in this locality, but I expect it only wants looking for.

S. populnea feeds in the aspen. The habits of this insect are very interesting. The larvæ cause tumour-like swellings on the stems and branches. They do not eat long burrows but remain in the interior of the node, from which they seem to procure a sufficient supply of food, until they arrive at perfection. It undergoes transformation in the interior of the stems and branches, in the nodes or swellings.

Polyopsia præusta is found in old hedges at Llangollen.

Stenostola ferrea probably feeds in the branches of lime trees in Dunham Park, which is at present its only known habitat, where I have frequently found it. As a long time elapsed without any specimens of this insect being re-discovered, it was suggested to erase it from the British list, when I had the pleasure of rescuing it by discovering it in Dunham Park.

Oberea oculata is found on willows at the Isle of Ely, and in Scotland.

Phytæcia cylindrica is found on hazel in Copenhagen fields, Ripley, Hertford, Cambridge, Whittlesea Mere.

Rhagium inquisitor is very abundant on the flowers of mountain ash. The large white larva, with a reddish brown head, is often found eating galleries, under bark of fir trees, oak, alder, &c. It is a very destructive insect, and generally distributed.

(To be continued.)

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 3, 1887.—Dr. SHARP, President, in the chair.

Mr. John Witherington Peers, M.A., of Wendover, near Tring; and Mr. R. G. Lynam, of the North Staffordshire Infirmary, Stoke-on-Trent, were elected Fellows of the Society.

Jonkheer May, the Dutch Consul-General, exhibited a pupa and two imagines of *Cecidomyia destructor* (Hessian Fly), which had been submitted to him for exhibition by the Agricultural Department.

Mr. W. White exhibited, and made remarks on, a specimen of *Philampelus satellitia*, Linn, from Florida, with supposed fungoid excrescences from the eyes. Mr. Stainton said he was of opinion that the supposed fungoid growth might be the pollinia of an Orchis. Mr. Poulton expressed a similar opinion, and the discussion was continued by Mr. Pascoe, Dr. Sharp, and others.

Mr. White also exhibited a specimen of *Catephia alchymista*, bred from a pupa collected by Mr. Ralfe last autumn on the South coast.

Mr. M'Lachlan sent for exhibition a number of oak-leaves infested by *Phylloxera punctata*, Lichtenstein, which he had received from Dr. Maxwell Masters, F.R.S.

Mr. Champion exhibited two rare species of *Curculionidæ* from the Isle of Wight, viz., one specimen of *Baridius analis*, and a series of *Cathormiocerus socius*. He remarked that *C. maritimus*, Rye, had been placed in recent European Catalogues as a synonym of the last-named species, but that this was an error. He also exhibited a series of *Cicindela germanica*, from Blackgang, Isle of Wight.

Mons. Alfred Wailly exhibited, and made remarks on, a number of living larvæ of *Antheræa pernyi*, *A. mylitta*, *Telea polyphemus*, *Platysamia cecropia*, *Actias luna*, *Attacus Cynthia*, *Callosamia promethea*, and other silk-producing

species. He also exhibited imagos of the above species, imagos of *Antheraea Yama-mai*, and a number of species of Diurni from Sarawak.

Mr. Poulton exhibited crystals of formate of lead obtained by collecting the secretion of the larva of *Dicranura vinula* on 283 occasions. The secretion had been mixed up with distilled water in which oxide of lead was suspended. The latter dissolved, and the acid of the secretion being in excess the normal formate was produced. Prof. Meldola promised to subject the crystals to combustion, so that their constitution would be proved by the final test.

Mr. Oliver Janson called attention to Mr. Pryer's new work, "Rhopalocera Nihonica," and to the fact that the illustrations had been executed by Japanese artists.—H. Goss, *Hon. Secretary*.

HAGGERSTON ENTOMOLOGICAL SOCIETY.

The meeting of July 21st was well attended, and various interesting exhibits were shewn, among which may be mentioned some very beautiful varieties of *D. conspersa*, and a dark form of *A. corticea*, by Mr. J. A. Clark. *C. miniata* from the New Forest, by Mr. Hanes, and bred *T. fimbria*, by Mr. Pearson, from larvæ taken near London. Mr. G. Lewcock, who presided, related his experiences from July 9th to 15th, working in a district having Woking as a base of operations. Several good species of coleoptera had rewarded his efforts, the *Donaciæ* especially being well represented. A discussion on the habits of *L. argiolus* was then introduced by Mr. Gurney, who has had considerable experience of this butterfly in its haunts at various parts of Epping Forest, and an interesting evening ensued, the subject being one giving room for argument and discussion.

The meeting of the following week was rather poorly attended and nothing of interest took place, but a large muster of members were present on August 4th, and several donations were made to the Society's collection. Mr. Hockett exhibited a series of *N. despecta (rufa, Hb.)*, which he had observed commonly the previous week. Mr. Clark brought a living specimen of a large series of *Cicada*, which he had captured in the Isle of Wight, and several members recognised it as a species occasionally observed all along the south coast; two very beautiful specimens of *A. aglaia* were also shewn by Mr. Clark, the one being of a silvery ground colour with the markings very black, the other being a dark suffused form. Mr. Eedle exhibited *A. ochrata*; Mr. Levett, some fine *C. porcellus*; and Mr. Anderson a long bred series of *P. cytisaria*, from larvæ found on *Genista anglica* in the spring. Attention was drawn to the abundance of the larvæ of *V. urticæ* and *V. io*, the former swarming along the banks of the River Lea, while Mr. Eedle stated that in

Essex he had noticed thousands and thousands of the latter, the nettles or rather what was left of them being quite black with larvæ. In the same locality he found the larvæ of *A. cardamines* rather commonly, and he gave a description of how to find them on the seed pods of the wild mustard, which they greatly resemble.

On August 18th there was a good attendance. Mr. Pearson stated that he had observed the larvæ of *C. elpenor*, *D. vinula*, and *H. chlorana* and Mr. Barker had taken the larvæ of *M. stellatarum* in the same locality. Mr. Hanes brought up a fine series of *Z. betula* bred from Epping larvæ, and Mr. Clark had a most interesting exhibit of *P. phleas* bred from the ova, also well preserved larvæ of the same, and a large drawer full of *Z. asculi*, all taken this year, some of the specimens being very beautiful, having the spots confluent, forming long streaks of metallic blue colour. A short discussion took place on the Hessian fly, and a notice calling a general meeting was read by the chairman, it being considered advisable to move the Society to a more central position, and to have the meetings fortnightly instead of weekly.—J. RUSSELL and E. ANDERSON, Joint Secretaries.

NOTE.—In the report of this Society's meetings, in the August number, Mr. Clark, by a printer's error is made to say that he took *L. alsus* at sugar. The line should read "and at Ongar, one of the few localities in Essex."

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

July 28th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. The Rev. W. F. Johnson was elected a member. Mr. J. T. Williams exhibited bred examples of *Phorodesma smaragdaria*, Fb. and *Dianthæcia irregularis*, Hufn. Mr. West (Streatham), *Apamea ophiogramma*, Esp., taken in his garden, flying over Ribbon grass, on which he believed the larvæ had fed. Mr. Tugwell, *Apatura iris*, L., with pupæ cases. Mr. Hall, varieties of *Abraxas grossulariata*, L. Mr. South, two varieties of *Melitæa cinxia*, L., the usual dark fulvous marginal band of the underside breaking up into spots, or having a tendency to form ocelli; he stated that the two specimens were taken in the Isle of Wight, on the 11th and 17th June respectively, the first being a male and the second a female. Mr. Dobson, lepidoptera from the New Forest. Mr. R. Adkin, living larvæ of *Spilosoma mendica*, Cler., reared from ova obtained from the Cork form of the species. Mr. Sheldon, *Pempelia palumbella*, Fb., from Leith Hill; *Ephippiphora nigricostana*, Haw (bred); and *Eupæcilia amandana*, H.S., which he stated he had taken in great numbers near Croydon, and the species seemed to fly for about two minutes only.

August 11th, 1887.—R. South, Esq., F.E.S., Vice-President, in the chair. Mr. Watson exhibited *Catocala promissa*, Esp., from the New Forest. Mr. West (Streatham), *Sesia asiliformis*, Rott. (bred); varieties of *Lycæna corydon*, Fb., and *Argynnis euphrosyne*, L. Mr. Wellman, *Dianthæcia albimacula*, Borh.; *Bryophila glandifera*, Hb. (*muralis*, Forst); a yellow variety of *B. perla*, Fb.; *Plusia interrogationis*, L., from Perth; dwarfed forms of *Aspilates gilvaria*, Fb., *Eubolia bipunctaria*, Schiff., and *E. mensuraria*, W.V. (*limitata*, Scop.); and living larvæ of *Heliothis marginata*, Fab. (*Chariclea umbra*, Hufn.), feeding on Knot grass. Mr. Mera, *Thera simulata*, Hub., from Ireland. Mr. Fremlin, a variety of *Vanessa urticae*, L. Mr. South, a variety of *Triphæna orbona*, Fab. (*comes*, Hub.), the colour of the hind-wings being a creamy white instead of bright yellow; a variety of *Vanessa io*, L., having a small extra ocelli on the hind-wing. Mr. Helps, *Macroglossa stellatarum*, L. The Secretary, on behalf of Mr. Lewcock, exhibited a number of species of Coleoptera, obtained chiefly in Surrey, and read notes on the exhibit. There were twelve species of *Donaciæ*, including *Donacia hydrochæridis*, F., *D. lemnae*, F., *D. linearis*, Hoppe., *D. menyanthidis*, F. and *D. comari*, Suf. Also, *Bembidium lunatum*, Dup., about a dozen specimens taken on the banks of the Thames, at Rainham, Essex, in August (1886), but it appeared from Mr. Lewcock's note that previous to this he had only come across the species singly. Several species of *Malachius*, *Cionus verbasci*, F., *Cryptocephalus lineola*, F., and many others were also in the box, the whole forming a most interesting exhibit.

The Secretary read a letter from Mr. Adkin, recording the unusual abundance of *Pieris brassicæ* and *P. rapæ* in the neighbourhood of Eastbourne, and several members contributed the result of their observations in different localities, and a discussion ensued as to the probable cause of the appearance of these species in such numbers in the southern counties, in which Messrs. Rendall, South, Carrington, Tugwell, Wellman, Hall, Step, and others took part.—H. W. BARBER, *Hon. Sec.*

PUBLICATIONS RECEIVED.

Science Lectures.

This is a series of addresses—seven in number—delivered before the Sunday Lecture Society, Newcastle-on-Tyne, and published by Walter Scott, 24, Warwick Lane, at the low price of 1/6. Space could not be spared for a review of even one of them, but we can very strongly recommend it to our young readers. It is a very suitable book to give to any one you might

wish to interest in natural science, for the subjects are presented in a popular readable style, not calculated to deter the beginner as scientific manuals almost of necessity are. Perhaps the best from one standpoint are:—“Animal Life on the Ocean Surface,” by Professor Moseley; “The Movements of Plants,” by E. A. Parkyn, M.A.; “The Animals that make Limestone,” by Dr. P. H. Carpenter; and “Facts and Fictions in Zoology,” by Dr. Andrew Wilson. One of the lectures, “The Eye and its Work,” by Dr. Forbes, is illustrated. We could have wished they all had been.

Proceedings of the Liverpool Naturalists' Field Club.

This must be a flourishing society, for their balance sheet shows subscriptions from nearly 300 members; one of their excursions was attended by nearly 100 members; and certain prizes they offer for competition attracting a large number. We are particularly pleased with these competitions, and they appear to be arranged with considerable judgement. Some of them are, to us, quite novel. For instance, they give during this year eight botanical enigmas for solution. The enigma consists of the botanical description of a plant occurring at the locality to which the excursion for the month is fixed. Thus on September 18th, at Hoghton Towers, the riddle is as follows:—Rootstock with long stolons. Leaves elliptical to strap shaped, tripinnate-partite or bipinnatipartite. Anthodes in a dense terminal corymb. Pericline ovoid. Phyllaries slightly woolly. Ray florets about half as long as the pericline. Climanth elongate conical at maturity. Epigynous disk without a pappus.” Members finding a plant answering the description, take it to the president or referee, and sign a form. After tea, the name of the plant is given, but finders may be asked questions on the description.

Last year the various enigmas were solved 74 times by 21 members, 11 of whom obtained prizes, for it must be solved four times to entitle to a prize. We observe our friend Dr. Ellis figures as one of the prize winners.

Prizes are also given for the best collections made in the year, and on each excursion; for the three best specimens collected during an excursion; for best bouquet of wild flowers; for the best water-colour drawing of four wild flowers, &c., &c. Also guinea prizes for the best collections of Land and Freshwater shells, of Marine Shells, of Lepidoptera, of Coleoptera, of Diptera, of Hymenoptera, of Neuroptera, of Orthoptera, &c., &c. Geological Microscopical, and other prizes are also given. A large prize of £5 is also offered for a Monograph, illustrated by specimens, and recording the localities of any principal group of plants or animals not hitherto included in the local Flora or Fauna. In all cases the collection, though sent in to the committee, remain the property of the competitor.

An interesting address by the president is given "On Floral Constancy and Mutability." There is also a third appendix to the "Flora of Liverpool," by Mr. Robert Brown; and a most useful list of "Books useful in the study of Natural History," with prices and publishers names. Altogether it is a most interesting and useful pamphlet.

The Naturalists' Monthly.

We have been favoured with an advance copy of this new candidate for public favour, which is edited by Dr. J. W. Williams, an old contributor to our own pages. It is difficult to speak of the scope of a magazine from a single number, but there is certainly a wide enough range in the subjects of the various articles that appear in No. 1. of this Journal. "The Pathology of the Celandine," in which some of the fungi affecting it are described; "The Evolution of the Fishing Hook, from the Flint Hook of Pre-historic Man to the Salmon Hook of the Present Day," a most interesting and suggestive paper; "A Study in my Garden," of which the present instalment is principally devoted to the Aphides; "Binary Suns," an account of double or other multiple star systems; "Charles Robert Darwin, a Biography," are all articles as suitable for the general reader as the specialist, and may be taken as a sample of the varied contents. Other articles are more for the specialist, the Mollusca appearing to have a preference. Our ubiquitous friend, W. Harcourt Bath, contributes a number of short paragraphs on a variety of subjects. Altogether it is as good a sixpenny worth as we seen for some time.

NOTES AND OBSERVATIONS.

VANESSA POLYCHLORUS IN SOUTH KNAPDALE, ARGYLLSHIRE.—I have pleasure in recording the capture of a specimen of the Large Tortoiseshell butterfly (*Vanessa polychlorus*), which I secured near Castle Sweyn, South Knapdale, Argyllshire, on July 20th. Along with some friends I had paid a visit to Old Kilmory graveyard, a very ancient burial place on the Sound of Jura, and was returning to visit Castle Sweyn, when I observed the specimen flitting about the garden, attached to a deserted house in a very lonely spot. I quickly netted it, but though I looked carefully for any other specimens that might happen to be in the locality, I was not fortunate in seeing any others. There were plenty of *V. urticae* flitting about, but the larger species was quite recognisable from these. Although I knew the species to be uncommon in Scotland, I had no idea that it had never been recorded in Newman's and Stainton's comprehensive works, which I found to

be the case on referring to them on my return home. Newman, in his "British Butterflies," says—"This butterfly seems to be absent from Scotland and Ireland, but to be generally, although sparingly, diffused throughout the midland and eastern counties of England In England its rarity in the north and extreme south-west is very noticable." Stainton mentions no Scotch localities in his list; while Coleman says, "In some places and seasons it is not rare, but is very uncertain in its appearance, abounding most in the southern districts, and being almost unknown in Scotland." He does not, unfortunately, mention any Scotch localities. At present I know of no previous record from Scotland, and should be glad to know if any specimen has been captured there to the knowledge of any of the readers of the *Young Naturalist*. The most northerly captures recorded by Newman are one specimen in each of the counties of Cumberland, Durham, and Lancashire. It seems a curious feature in connection with this insect that it almost always occurs singly, and the above authority adds "in the very numerous records I have received more than half speak of single specimens." It is, therefore, not surprising that I should have met with only one. The specimen is in fairly good condition, but it differs somewhat in colour from the English specimens of this species which I have in my collection. One would hardly expect to meet with this southern insect so far north-west, but it is only a further evidence of the very prolific nature of the district in uncommon and rare lepidoptera. My friend, the Rev. Dr. Walker, of London, who was collecting with me in Knapdale, took a specimen of the Speckled Wood (*Satyrus egeria*) at Tayvallich, and I find Newman, in speaking of the distribution of this species in Scotland, says that "In Scotland it has not been recorded beyond the north of Argyllshire." It seems that if anything is rare in Scotland one has only to visit this secluded and little-worked district to find it! Perhaps we may look for the Large Copper next summer, and, of course, *not* find it!—JOHN MACKAY, Kingston, Glasgow.

[*Polychloros* is but an occasional visitor in the north, and the only previous record of its occurrence in Scotland is of one taken in Aberdeenshire, see the "Scottish Naturalist," Vol. I. In 1769 it was given, in the "Natural History and Antiquities of Northumberland," as a native of that county, but up to 1858, when Mr. Wailes' "Catalogue of the Butterflies of Northumberland," no other record existed. During the last 30 years a few stray specimens have been found in both these counties, but without any reason to suppose they were other than wanderers from their native habitat. From Cumberland a single specimen only is recorded, and Lancashire supplies one record also.—Ed. Y.N.]

POLYOMMATUS ICARUS AT HOY.—May I correct a slip of the pen in the excellent "History of British Butterflies," now publishing in the Y.N. Mr. Dale mentions the occurrence of *Icarus* in the Isle of Hoy. This is one of the Southern Orkneys. The insect is not yet reported from Shetland, it occurs, however, in the main island of Orkney, and I believe that to be the most northern recorded locality in Britain.—E. R. CURZON.

[The above note is not very clear. Hoy is not so far north as the "main island of Orkney," on which Mr. Curzon admits it to have occurred. In a list of the lepidoptera taken at Hoy in 1881 (Ento. xvi.), *Lycena icarus* is given, with the note, "The specimens are large, measuring as much as 1 inch 5 lines; an unexpected fact." I do not understand the reference to the Shetland Isles, which are still further North.—J.E.R.]

LUPERINA CESPITIS AT HARTLEPOOL.—I have had the pleasure to-day of taking a specimen of *Luperina cespitis*, which is an addition to our local list, and so far as I know new to the County. It was on some palings near the railway, and possibly may have been brought on a goods truck, as I have no doubt insects are frequently carried to new localities.—JOHN GARDNER, Hartlepool, 24th August, 1887.

NOTE ON SOME VARIETIES OF DIANTHÆCA CONSPERSA FROM NORTH WALES AND FROM SHETLAND.—In July, 1885, I took a friend to the *Scolia-formis* Wood, near Llangollen, to search for that insect. Having shown him its burrows in the birch tree bark, I turned my attention to other species as my series was complete of "Scolia." Next day being dull we went *Dianthæcia* larvæ hunting, and secured quite a lot of *D. carphophaga*, *capsincola*, *cucubali*, and a few *conspersa* amongst them. From these few *Conspersa* larvæ I bred five good specimens, every one of which are so different from the type which I have taken at Pennan Bach (North Wales), Isle of Man, Cumberland, Westmoreland, and North Lancashire, and from the wonderful ochreous variety of it which I bred from Mr. Curzon's larva from Hoy (see *Young Naturalist* in 1885-6), and which I call "Var. *Ochracæ*," that I determined to describe them as *Dianthæcia* var. *Albimaculoideæ*. Ground colour cold deep brown, thorax dark grey, shoulder marks (first striga) only just indicated, many wavy black markings on the disk, and seven or eight black marks on the costa, and along the hind-margin the broad arrow heads are black, the first stigmata like that of *Albimacula* is round, white with a dark centre, the exact colour of the ground of *Albimacula*, as is also the filling in between the black wavy lines, the second stigma is lost just as in *Albimacula*, and the usual white marks in typical *Conspersa* are merged into brown in var. *albimaculoideæ*. I may say in passing that I received

some *D. conspersa* larvæ in 1886, from Mr. Curzon, when in Shetland (on the mainland); these produced six specimens, five perfect and one injured, identical with my Welsh variety *Albimaculoideæ*. Note, the variety of *D. conspersa* var. *obliteræ* first taken by Weaver, in Perthshire, and which were mistaken by Newman (see "Zoologist") for *Barrettii*, are rich, full ochreous brown without any markings; but the figure No. 15, plate 39, there called *Miselia compta*, is in "Westwood and Humphry's British Moths," is certainly a variety of *Conspersa*, with rather more white upon it than variety *Albimaculoideæ*, but the description of *Compta* on page 187 of the same work is certainly a description of *Compta* where it is said "the wings being regularly fasciated with white," but it applies to *Conspersa* where it is said "It feeds on *Lychnis dioica*, *Compta* feeds on *Dianthus*."—C. S. GREGSON, Fletcher Grove, Liverpool.

POLIA NIGROCINCTA BRED.—I am now breeding *Polia nigrocincta*, the larvæ of which I took at the Isle of Man last June. I have already set five beautiful specimens, three males and two females.—C. S. GREGSON, Liverpool.

A DWARF SPECIMEN OF CABERA PUSARIA.—I took an exceedingly dwarfed form of *Cabera pusaria* in Hezledon Dene last month. It is barely ten lines in expanse, a well grown specimen reaching fifteen lines. I thought it was *subsericeata* when I took it in the dusk, but it is a perfect *Cabera*, and differs from the normal form of *pusaria* in having one grey line only, the outer one, instead of the usual number. It is a female.—JOHN E. ROBSON, Hartlepool.

EUPITHECIA PERMUTATA AT LIVERPOOL.—I am now taking the larvæ of *Eupithecia permutata* in the flower buds of *Clematis vitalba*. Hitherto this has been considered an exclusively southern species, but some years ago I found it feeding at Whitbarrow Scar, but did not get them through for want of food. On seeing a fine *Clematis vitalba* in a plantation at Formby last week, I renewed my acquaintance with this interesting species. *E. permutata* is common at Darenth, where the *Clematis* grows wild in the hedges, but it is only a garden plant hereabouts. You can hardly realize how pleased I felt at seeing the little round holes in the flower buds, and plenty of them.—C. S. GREGSON, Liverpool.

A STRANGE LARVA ON CABBAGE.—Last week I went over a farm with its owner, to ascertain what was destroying his cabbages. At first sight I said "larvæ of *Mamestra brassicæ*," but on opening a cabbage I observed traces I had never seen before, but no larvæ. I opened another, no larvæ, and the traces were certainly not those of *M. brassicæ* either habits or frass.

At last I found a larva quite unknown to me. Again and again I pulled a cabbage to pieces, most of the larvæ were gone, but eventually I secured about a dozen. But what are they? I have gone over every genus, and cannot satisfy myself. One group only comes back to me, the *Pyrales*. Can it be *Botys urticae*? What, a nettle feeder living on cabbage! Impossible! It is quite thirty years since I had *urticae* larvæ, but these recall them to my mind, only they have a row of distinct black dots on the sub-dorsal region, which I do not remember on *urticae*. I have been trying to think they were *Laphygma exigua* which should be about their size, but I always come back to *urticae*. Yet it will be a strange thing if they turn out this species only.—C. S. GREGSON, Liverpool.

SOME ARGYLLSHIRE NEUROPTERA.—The following list of neuroptera taken by the Rev. Dr. Walker and myself, at Tayvallich, during our short visit to that place in July, may prove interesting to those of your readers who study that particular branch. The list of species is, no doubt, a small one, but in explanation I may state that the weather during our stay was very unfavourable for collecting specimens of this order, and indeed most of our captures were taken at rest on the rushes bordering the peat mosses. Not having paid much attention to this order I am not aware that any of the species taken are of any rarity, but coming from so unfrequented a district they may prove interesting as giving an idea of the species to be found there.

Leptethrum quadrinaculatum, three specimens.

Lestes sponsa, fairly common.

Agrion cyathigerum (?), common.

Agrion pulchellum.

Aeschna juncea, common.

Pyrrhosoma minium, common.

Sympetrum Scoticum, rare.

We took in all some 200 specimens, but had the weather been more favourable I do not doubt but we should have added considerably to our captures. The various peat mosses in the neighbourhood, from which the inhabitants obtain fuel afford splendid collecting places for Neuroptera. Last summer we took two specimens of *Aeschna cyanea*, but this season we did not see a single specimen. I should be glad to know if any of the above named species are anyway rare, or of northern distribution.—JOHN MACKAY, Glasgow.

THE RED-THROATED DIVER AT HARTLEPOOL.—My son has just had a specimen of this bird given him. It is a young bird, but has the red patch on the throat very distinctly developed. We seldom see it here.—JOHN E. ROBSON, Hartlepool.

AN EXCEEDINGLY DWARFED SPECIMEN OF *TEPHROSIA BIUNDULARIA*.—Mr. G. Rose, of Barnsley, brought this extraordinary specimen to me to name. At first sight I thought it only a poorly marked example of *Acidalia contiguaria*, but on examining it with a glass I saw it was a dwarf, but a perfect form of *Tephrosia biundularia*. To say that it expands only half-an-inch conveys no idea of what a tiny specimen it really is, but if I say that it is smaller than any *Eupithecia tenuiata* in my collection, a good idea of what its real appearance may be formed. Mr. Rose took it in June last on a cottage window, near the Barnsley locality for the species, and with the utmost liberality has presented it to me, to enrich my collection of varieties.—C. S. GREGSON, Liverpool.

SIREX JUVENCUS AT HARTLEPOOL.—I have had a specimen of this rather scarce species brought me to-day. It was taken in company with its big brother *Sirex gigas*, in the shipyard of Messrs. E. Withy, & Co., and had doubtless emerged from some of the timber there.—JOHN E. ROBSON, Hartlepool.

PECULIARITIES OF THE SEASON.—What has become of the generally common *Apamea gemina* and *Xylophasia rurea* this year? They are generally so abundant that I could take 50 or 60 of each per night, if I wanted them, at the flowers of *Hieracleum*. This year I have not seen half-a-dozen of both species together. Has the scarcity been general or confined to this district? On the other hand *Mamestra albicolaris*, generally a scarce insect with us, has been unusually plentiful. At Campion flowers it was more numerous than any other species. Other species have appeared about as usual, except perhaps *Heliothus marginata* has been rather more common. Altogether it has been an exceptional year so far. My hope is that it may continue so. I have heard of *Antiopa* being taken in Yorkshire, though I would not like to guarantee the statement. I would be glad to see an abundance of it, and the rare hawks before the season closes. *Quien sabe?*—JOHN GARDNER, Hartlepool, 30th August, 1887.

ANOTHER VISIT TO LUNDY.

By JOHN HENDERSON.

Some notes on a fourth visit to Lundy Island this summer may be of interest, although I did not make anything like the lengthened stay at first intended. The day I arrived was one of the hottest in July, and as the Ilfracombe steamer "Velindra" slowly drifted into the little sheltered bay on

the east side of the island, which is a natural harbour—sheltered by Rat Island from all winds, but the E. and N.E.—the heat was something tropical. Subsequent investigation showed that Lundy was like the mainland, feeling the effects of the long continued drought, the store of fresh water being very limited, and the surface burnt up and scorched by the sun. There has until just recently (August 18th) been literally no rain since the spring; and a new reservoir, or pool of granite blocks, built close to the farmhouse, was quite dry in July. This erection was being taken in hand during the previous summer, and would in ordinary circumstances, have afforded a large supply of fresh water. On landing, the first objects to meet the view were the little 6-spot Burnets (*Zygæna filipendula*), which were flying in the utmost profusion. Upon the highest point near the lighthouse on the west coast, near the "Devil's Punch Bowl" (a curious natural hollow in the granite rocks), and all along the western coast the perfect insects swarmed; while the pale straw-coloured cocoon, with the black protruding pupa case, were attached to blades of grass, heather stems, rushes, and as an old collector once remarked, "you could even find them on chalk blocks."

Next to the Burnets were in point of numbers the Common Blue, *P. alexis* (*Icarus*), the females were flying pretty freely, but the males prevailed. Some of the gentler sex are much suffused with blue, and hardly to be distinguished from the males, and the brown specimens are found mostly at one end of the island.

In a sheltered nook, where the only trees on the Island exist, a larva of *Vanassa atalanta* was procured, it was full-fed, and within 24 hours was firmly fastened up by the tail to the roof of the collecting box, and the perfect insect has since emerged. Working mostly on the granite boulders and scrambling over the heather-covered slopes, we netted a fair quantity of *Satyrus semele* (the Grayling). The specimens are bright, and rather darker than those usually met with, but not so large as a series of the same insect from the New Forest and Berkshire, but a trifle larger than Isle of Man specimens. It is usually a rock loving butterfly, and bids fair to continue long with us, for each year the numbers seem to increase instead of diminish, and the mainland examples are very fine indeed.

On the higher points of land a couple of *S. megæra* (Wall) were taken, they were both males, and rather diminutive little butterflies. This is a species which evidently is on the downward track. Years ago it abounded in the Oxfordshire and other districts, in roads and open spaces, but in last ten summers I have not met with a dozen specimens, one at Box Hill, in 1884, a couple on the top of Hillsborough (a high part of the coast near Ilfracombe),

and others at Lundy, are all I have chronicled since 1874, but in 1868, it was fairly plentiful.

Giving the insects a short rest, I must notice the birds at Lundy. A great many Puffins were seen from five to six miles off the island, "Lundy Parrots" they are locally called. The eggs this year were more numerous, a dirty white with rust-coloured spots, which appear to be in the shell; I secured a nice series. The Guillemots and Razorbills were in the usual numbers, Kittiwakes rather scarce, and a few Lesser Black-backed and Herring Gulls eggs were the only others that had been saved. The sea birds are supposed to be left undisturbed, and Mr. Beaver, the proprietor of the island, has endeavoured to prevent the indiscriminate collection of the eggs, which must in time reduce the number of the Gulls. As, however, at the time I mention, some 3000 eggs were still kept in one house, for sale at 6d to 3/- a dozen, all unblown and perfectly useless, being discoloured and rotten, it would appear the regulation is not strictly enforced. Our feathered friends are having a bad time of it, what with this and the shooting, which commenced on August 1st, before many of the young birds are fit to take care of themselves.

(To be continued.)

EDITOR'S CHAT.

A CABINET CLUB.

It has been urged upon me that a Cabinet Club, would be a boon to young collectors. The *modus operandi* of such a club is detailed in Mr. Gillo's article on "Boxes and Cabinets" (Y.N. p. 131.), but had better be repeated here. The Club should consist of any number of members, who agree to pay 2/6 per week, for 120 weeks. A Cabinet of 30 drawers will be supplied by one of the best London makers at £15. As soon as the weekly subscriptions amount to that sum, a ballot will be taken, and the successful member will have his cabinet placed in his possession at once. This will, however, remain the property of the club until the subscriptions are all paid up, when it will be his absolutely. My friend, Mr. Anderson, informs me that a very successful club has just been wound up in London, and advises that one be started through the Y.N. I will be glad to hear what number of members such a club would be likely to have, as it would not answer well with a very limited membership. I may say that the maker of the cabinets would take the risk of any bad debts that might possibly be

made, so that the members would be assured of receiving the full value of their money in any case. The cabinets would be of very best make, with mahogany front, the drawers glazed, corked, and papered, and are strongly recommended to me by those who have had them.

BOXES.

Mr. Gillo's note on this subject, brought a larger demand for boxes than I had expected, I have now a fresh stock and can send at once, at 4/6 each, carriage free. I need scarcely say that neither Mr. Anderson, who is assisting me in these matters, nor myself have any gain. We are only desirous to put the best article possible into the hands of young naturalists, at the lowest possible price, believing that proper receptacles for their captures is one of the best encouragements that can be given.

IMPOSITION.

It has always been my study in conducting the *Young Naturalist* to warn beginners, whose purse might be longer than their experience, against the means that are adopted to palm Foreign specimens of rare British species upon them. I take some pride in having exposed the *Hera* swindle, and in stopping the *Artemisia* business. I have always refused to publish the report of a reputed capture when the surroundings were shady, but I notice now a new plan has been adopted by certain dealers. The announcement of captures in the magazines have been dropped, as being too much open to comment and criticism. In lieu of this some gentleman is induced to exhibit a specimen at the meetings of one or other of the Entomological Societies, and then the reputed capture gets to the public through the report of the meeting. To advise young naturalists to disbelieve in the authenticity of anything exhibited at such meetings, except by members, would be going too far, but there can be no harm in advising them not to purchase such insects. In fact, the best plan for beginners to adopt, is not to purchase anything very rare under any circumstances. You may safely rely on one thing: there are enough buyers of rarities in the market to snap up all really genuine specimens before they are offered to you. Be content to fill up your rows of common things first, scarcer species will come by degrees, and then when you have but a few blanks in your cabinet, you will have experience enough to know whether the reputed capture is probable. One of the first collectors I ever knew, had among his first year's specimens, *Lathonia*, *Euphorbia*, *Galii*, *Nerii*, *Pulchella*, and I don't know what else, and for some of them he had given long prices.

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A PLEA FOR FUNGI.

BY A BOTANICAL ENTHUSIAST.

PERHAPS there are no class of vegetable productions that are viewed with greater contempt and detestation than the Fungi or "toadstools." To the farmer or gardener it may be that various obnoxious weeds might dispute the palm of opprobium, and excite his more active dislike, but by the vast majority of the general public they are regarded with repulsive loathing. Even the average botanist, who is supposed to love everything that springeth from the ground, is yet repelled from the study of the obscure and fragile fungi. Popular prejudice is so strong against the toadstool, that if any one dares to hint that tons of valuable food, easily accessible to all, are annually wasted, whilst millions of pounds of hardly-earned money are spent upon less nutritious and more expensive articles of diet, one is looked upon as either a fool or a fanatic, or perhaps both. And yet, notwithstanding the culinary horror of all except the cultivated mushroom, it is a fact that more delicious species than the ordinary edible mushroom abound in every part of our land, waiting only to be known to be appreciated. But the aversion in the rural mind, where the supplies are most abundant, is the most deeply rooted and ineradicable. This present autumn, in the northern Scottish woods, I observed immense quantities of the delicious *Boletus edulis*, of huge proportions, nearly a foot in diameter, with a thickness of two or three inches, and supported on a stalk as thick as a man's wrist, sufficient for a good square meal. Yet when I tried an elderly relative to cook one for me, she replied in the broadest Doric, "Na, na, laddie, I'll no pushon ye!" and although I volunteered to prepare them myself and to take all the responsibility, she remained obdurate, and my luscious morsel was consigned to the dunghill. This is only a sample of the ignorant prejudice of the peasantry of both North and South. But it is most marked in the north, for who ever saw a mushroom cooked in a Scottish farmer's kitchen, ploughman's "bothy," or shepherd's

“sheiling”? It is curious to hear the reasons given for this antipathy. In some cases it is an honest dread of untoward results from eating noxious species. More frequently it is a contempt for such nauseous messes—“swine’s food.” Often it is a tinge of British insular pride, an idea that such fare is only fit for the devourers of “snails” and “paddocks,” the vernacular “puddock-stools” being associated in their minds with that much maligned amphibian. It is surprising how chary even those epicures, who are fond of the common mushroom, are of experimenting upon other even more delectable kinds. Having in recent years submitted over 20 distinct species to the test of the table, although with fear and trembling on the part of my household, but with no other bad results, I have not yet made many converts to fungophagy.

Ketchup is a favourite condiment with gastronomic connoisseurs, and yet a deal of faith has to be exercised by those who use it, for if one was to see the multifarious mixture of species gathered without the slightest botanic knowledge, and used up in its manufacture, it would impress the fact that poisonous kinds cannot be so common or so virulent after all. No one would advocate the indiscriminate use of all sorts that are to be met with, but handbooks on the science are now so cheap and accessible, that any one who can recognise the common mushroom, may easily learn to distinguish the most generally distributed edible species. There can scarcely be said to exist any safe, sure, and simple rules which include all the harmless, whilst excluding all the poisonous species, but generally speaking all those with bright colours, or the flesh of which changes colour on being bruised or cut, and which have an acrid or pungent taste, should be avoided by the tyro till he has learned confidence in his own powers of discrimination.

One notable exception may be mentioned, as there is no possibility of mistaking it for any other, and the collector who finds it has a prize. It is the beef-steak fungus (*Fistulina hepatica*), which grows in autumn on tree trunks (chiefly oak), sometimes attaining a large size, weighing several pounds. It is of a rich dark crimson colour, and its shape resembles the lobes of the liver, which it also closely approaches in texture and consistency as it matures. When cut, its marbled flesh, veined like beetroot, exudes a fluid like blood. When fried it rivals a beefsteak, and forms no despicable substitute for it, to the keen appetite of an appreciative botanist. Unfortunately, it is rather rare.

But apart from their economic value, to the student or lover of nature, the fungi ought to have a special attraction. In their general structure, mode of growth, and reproduction, they are so diverse from the higher organised plants in the scale of nature that the study of them comes with all the charm

of a fresh revelation. Were it possible for anyone to have lived surrounded with the ordinary forms of vegetation and never have seen a fungus, he could not have conceived anything so *outré* or unique. To the ordinary botanist also they have the charm of coming most copiously into existence at the period of the year when other plants are withering and fading, for it is in the autumn months that they are most abundant, and although individually most of them are very evanescent, yet the constant succession is so great that specimens abound on every hand. In no department of the vegetable kingdom is there more variety of shape, from the perfectly spherical puff-ball to the graceful and elegant parasol mushroom and the stately fly-agaric. In colour they vie with the animal and mineral worlds. In none of Flora's painted beauties is there such depth and richness of colour as in the *Russulas* or *Cortinarii*. The brilliancy of the metallic hues in various species rival the enamelling of an insect's wing, and in its mutability the varying dyes of peacock or pigeon. Another very striking peculiarity is the rapid change of colour of the flesh and fluid of some species when cut or bruised. This is remarkably characteristic of the large and handsome *Boletus satanas*, often found growing under trees in pastures, the white flesh of which changes instantly to a most brilliantly beautiful cobalt blue, when the cut surface is exposed to the air. This forms a most interesting experiment to the young collector. Similarly, in the *Lactarius*, or milk-bearing section, which are easily recognised by the plant exuding a copious milky fluid when cut. In some species the juice remains of a pure unalterable white, whilst in others it changes to a sulphur or bright yellow colour. In external coating there is an endless variety, some being smooth, soft, shining like silk or glistening as if varnished, or dry and burnished like brass, whilst others are viscid and sticky as if covered with liquid glue. Others again are rough with warty excrescences, or shaggy with downy coats, or fringes of hair. The textures are equally varied. Some are firm and compact of a cheesy consistency, whilst others of equally robust appearance are fragile and brittle, snapping like the thinnest of glassware. Some are tough enough to make razor-strops, and rival wood or leather in durability, and others again are so delicate that the act of gathering destroys them; real fairy emanations, which a breath, if not a look destroys. Some remain for years in the herbarium, without any preparation and impervious to all changes, whilst others deliquesce and melt into a liquid watery mass almost before one can carry them home.

Nothing perhaps is more characteristic of the whole tribe than their peculiar smell, which is recognised as a fungoid odour, associated with closed vaults or damp dark cellars, where various members of the family love to revel. So general is this characteristic, that to the outsider it is almost in-

credible that certain species emit a delicious fragrance such as *Anise*, *Myrrh*, *Cinnamon*, or *Melilot*. Unfortunately these forms are scarce and unobtrusive, so as to be passed unnoticed and unheeded. On the other hand, who that has wandered along a country lane in Autumn, has not had his nostrils assailed by a whiff of intolerable fœtor exciting the supreme disgust of his olfactory organs, and conjuring up visions of rotting carrion. Yet it is produced by a simple though curious and common fungus (*Phallus impudicus*), popularly known as the "Stinkhorn." Evolutionists maintain that the fragrance of flowers is emitted as a lure to entice the visits of insects whose attentions are beneficial to the future of the plant itself, but the effluvium of the "stinkhorn" seems obscure, if not inscrutable, on any such hypothesis. Although it, as well as most others of the Order, form a nidus for the egg of various insects,—even the most deleterious swarm with maggots before passing finally to decay.

Placed by botanical classifiers at the bottom of the scale of vegetable organisms, Fungi compensate for their lowly structure by their ubiquity, for whether we ignore them or not there is no escaping from their influence. Their invisible spores swarm in every breath of air we inhale, and it is only vigorous vitality that enables us to resist their attacks, for as soon as one form of life is extinct, another in which they play an important part takes its place. Putrefaction and decay afford them suitable sustenance. Nothing is secure from their ravages. The housewife's bread and jam, the grocer's bacon and cheese, the draper's cloth, the shoemaker's leather, the carpenter's timber, and even the student's books in his library are alike the objects of attack. Nothing that has had an organic existence can claim to be exempt, and even living tissue succumbs to their assaults. The premature decay of the florist's flowers, the gardener's fruit, the farmer's wheat and potatoes, and numberless other instances which might be adduced all testify to blighted hopes, and the necessity for a more intimate study of the life-history and nature of Fungi.

Bishop Auckland, August, 1887.

SLUGS AND THEIR VARIETIES.

BY DR. J. W. WILLIAMS, M.A.

Editor of "THE NATURALISTS' MONTHLY."

I have been asked by your Editor to write an article for these pages dealing more specially with the types and varieties of some one molluscan group. To this request I gladly comply, and the group I have selected is the Lima-

cidæ or the Slug, not for the reason that they are the easiest of any to work at, but because they provide many examples of what a type is, and what a variation from a type means. Perhaps, with the reserve of the Leech-group, the snails and slugs are subject to more varietal marking than any other subdivision of the zoological kingdom. What the real cause of this variation may be, remains as yet veiled to us, and there can be but little doubt but that we shall have to wait some time before we surely, and once for all, get at the bottom of things. Perhaps external conditions, such as the interference of the economy of the animal by wet, damp, or prevalent sunshine, may be a factor in the production of the change; then the difference of the food-plant in one region to that in another; and lastly, and in my mind the greatest factor yet known, is cross-breeding—just as in the plant-kingdom we get many instances what a great effect is worked by this cause in the making of the beautiful flowers around us. That this last is no idle speculation, I have proved over and over again by rearing slugs, and producing varieties by intercrossing, though I should be going out of my way indeed, to dogmatically assert that this is the sole cause, and that we have to look for none other. I simply assert that in my own thinking, and from my own observations it is the most active cause so far as our knowledge extends at present. From some force or other then slugs are varying in their markings at every generation that is born. We never see two generations from one parent alike. If we had chronicled all the varieties on this earth to-day, that would be no reason for us to state that we had done our work. One year, or two years hence, some fresh arrivals in the field would occur, and additions would be made to our already large list. So much is this so that we may almost safely aver that every slug we find is a variety, and that we have no such distinctive characters as in other groups, to tell us what is this species or what is that species. The real type of a species from which all the varieties have originated we cannot tell, but because we must have types for description's sake, we have picked out the one slug of a species whose characters seem to be more fixed than any one other, and given it the name of type. Then if a slug be found differing in colouration or what not, from the description of a type, but in the main possessing all the specific distinctions of that type, then it is a variety of that type. I hope this is plain, for the meanings of the two terms "type" and "variety" must be well understood by every slug collector, and by every one who would understand the current descriptions of slugs.

There are four genera of our slugs, *Arion*, *Geomalcus*, *Limax*, and *Testacella*. The second of these, in this paper we may pass, over for it is exceedingly rare, and has only been found in one or two places in Ireland. The

genus *Arion* may be easily distinguished from that of *Limax* by the former having the respiratory orifice in the fore-half of its mantle, while the latter has it in the posterior half. The *Testacella* differ from all the other slugs in carrying their shells on the ends of their tails. *Arion* and *Limax* live entirely in the open air and are herbivorous; *Testacella* burrows underground, and is carnivorous, feeding on earth-worms. We must take each of these genera separately. *Arion* has four species: *A. ater*, *A. hortensis*, *A. subfuscus*, and *A. Bourguignati*; *Limax*, nine species: *L. gagates*, *L. marginata*, *L. flavus*, *L. agestis*, *L. lavis*, *L. tenellus*, *L. arborum*, *L. cinereo-niger*, and *L. maximus*. (*L. gagates* and *marginata* have been classified in a sub-genus of *Limax* known as *Amalia*, so that now we sometimes hear them spoken about as *Amalia gagates* and *Amalia marginata*.) *Testacella* has two species: a commoner one known as *T. habiotidea*, and one rarer, *T. Mangei*.

I. GENUS ARION.

ARION ATER. This is the common black slug of our gardens and fields, though there are varieties belonging to this species which are not black. Black, however, is the type colour. Its body is rounded in front, and attenuated behind, the mantle is finely shagreened, and the margin has a band, usually of a yellow colour, with dark transverse lines, while the skin is covered all over with coarse tubercles. A variety that is red all over is known as *v. rufa*; one that is yellowish all over *v. succinea*; one that is completely coloured of a dirty-white *v. pallescens*, and one of a purely white colour *v. albida*. *V. albolateralis* has its back black, sides whitish, and a foot-fringe of orange, the colours being sharply defined from each other; *v. bicolor*, its back dark brown with its sides yellowish or orange, and *v. Draparnandi* its back and sides dark brown, and a yellowish or orange foot-fringe.

A. HORTENSIS.—This species is much smaller than *A. ater*, and is banded longitudinally, measuring when full-grown about $1\frac{1}{2}$ inches in length. The foot-fringes are coloured, and the mantle has usually a dark band running through its middle, and one round its margins. The type is slaty-grey with longitudinal stripes (bands) of black. There is a bandless variety, pale grey in colour, and named *v. grisea*, one black with side bands of grey, *v. nigra*, another deep grey with a blackish band on each side, *v. pyrenaica*, and yet another reddish in colour and thick banded, *v. rufescens*. *A. subfuscus* and *A. Bourguignati* have been but recently described as natives to England, and any slugs found, thought to belong to either of these two species must be examined with the greatest caution, and with the help of some one skilled in slug-lore. Mr. Geo. Roberts states in "The Naturalists' Monthly" that he that he has taken both of them in his garden near Wakefield, and probably

they will turn up in many places, if the many readers of the "Young Naturalist" will search well for them. Mr. Roberts describes *A. subfuscus* thus: "Body brownish-yellow, shield (mantle) unicolorous, pale orange, lateral dark stripes rather obscure. *Rugæ* not so acutely ridged as in *A. ater*. Size half that of *ater*." *Arion Bourguignati* has its body greyish-white but is more black on the back, and has bands on its sides. The mantle is large and blackish-grey; the foot is dirty-white, and the foot-fringe greatly dilated behind.

II. GENUS LIMAX.

L. GAGATES.—This slug is a local one, but it is pretty commonly distributed throughout the Midlands, wherefrom I have had many specimens sent me, and where I have collected largely. It is distinguished from all other Limaces by having its mantle bi-lobed, seen best when the animal is extended out at full length, and in having the tentacles of a dusky slate colour. The back is prominently keeled, the keel extending along the length of the back, backwards from the posterior edge of the mantle. The mantle is granulated, a feature it possesses in common with *Limax marginatus*, while all the other Limaces have it concentrically striated. It was on account of this peculiarity that Moquin-Tandon formed his sub-genus *Amalia*, and his classification has of late been accepted by English conchologists, and, consequently, *L. gagates* and *marginatus* are now known, as previously hinted, by *Amalia gagates* and *Amalia marginata*. The Rev. B. J. Clarke was the first to describe, in the annals of natural history, *A. gagates* as a native of the British Isles. He found it inhabiting several localities in Ireland. The type is black. When a slug belonging to this species is olive-coloured, it is *v. olivacea*; when lead-coloured, *v. plumbeus*; and when drab-coloured, *v. rava*.

LIMAX MARGINATUS (*Amalia marginata*).—This slug will be distinguished from the preceding species by not having its mantle bi-lobed, and from the other Limaces by having its mantle granulated, and by a strongly developed keel running the length of the back, always lighter in colour than the rest of the body. It is a common slug, and is the pest of the gardens round the north of London where I reside. You find it very active after a good shower of rain, and this is the time to go on the search. The type is rufous-brown. A yellowish-red variety is *v. rufula*; and one with a reddish mantle, and the body greyish, with a longitudinal black band on each side is known as *v. rustica*.

(To be continued.)

A FEW NOTES ABOUT LIPARIS DISPAR AND CLOSTERA ANACHORETA.

By J. W. TUTT, F.E.S.

Among our British lepidoptera there are two species which very few entomologists have ever seen alive in a state of nature, yet nearly all our collections contain them, and generally speaking we obtain them as soon as we commence collecting. I refer to *Liparis dispar* and *Clostera anachoreta*. Both have been occasionally taken in England, odd specimens; both are common on the Continent; and both can be bought in any of the earlier stages from Continental dealers.

There is no doubt that the few specimens obtained in this country would not suffice to supply even a small fractional part of the number in our cabinets, even with the most careful interbreeding, and the insects offered in exchange and sent out are undoubtedly either directly or indirectly the progeny of foreign parents. It is next to impossible to obtain a genuine British example of *L. dispar*. Whether our climate is not adapted to its development and spread, or whether other causes are at work of which we know nothing, certain it is that the insect is very rarely obtained. Perhaps as young entomologists have no trouble in filling their series when they commence, they do not afterwards think the capture of such a common (?) species worth notice. If so, will they in future record any such occurrences?

The other species, *Clostera anachoreta*, they are even less likely to have the pleasure of meeting with. The few specimens originally taken at Folkestone have been added to by thousands, for the purpose of filling series. Now and again as some comparatively new hand meets with what he considers rather a good species, and sees *Anachoreta* (bred) figuring in the exchange columns of the entomological journals, he parts with his really British insect for another whose British origin is considerably more than doubtful. *Anachoreta* not bred, but yet British, would be "a sight for sore e'en."

There are many more species of lepidoptera very rare in England, which it is no trouble to get through exchange. *Deleiphala galii* and *euphorbiae* are well known examples. Continental pupæ may be bought for 9d. and 4d. each. *Sphinx celerio*, which is almost as expensive on the Continent as here (Dr. Staudinger quotes it at 7/6), and which can rarely be obtained in its earlier stages, is never offered. *Catocala fraxini* ova, can be obtained at about 1/- per dozen, and I have had numbers of other doubtful Britishers offered me of late years. These are only examples of species, excessively common on the Continent, and easily obtained by any beginner who has a

genuinely rare, or good local British species. Although the supply of these has increased to a great extent, they are not got rid of in the same quantities as *L. dispar* and *C. anachoreta*, which are easily reared and interbred. When disposed of, they are generally said to be of *doubtful British origin*, but the two domestic species before named have no questions asked about them at all, and because neither of them is looked upon as a rarity, their British origin is assumed to be beyond question.

A NIGHT'S SUGARING IN WHARNCLIFFE WOOD, YORKSHIRE, IN AUGUST, 1887.

BY C. S. GREGSON AND G. ROSE.

I left Liverpool for Barnsley by the 3.45 express, to meet Mr. Rose at Barnsley. We left Barnsley at 6.30 for Oughty Bridge; reached there about 7.15. Wharncliffe Wood joins Oughty Bridge Station, on the Sheffield and Manchester line. We walked about one mile up the wood, and then sugared another mile on both sides of the ride; walked backwards and forwards three times, finishing at the top end the last time up, time 10.30. We had thus walked six miles in the wood, one to the sugared ground, and five times over the sugar, when I enquired, as I packed over a half-gross of full boxes, "how do we get to our beds." Mr. Rose seemed as fresh as new paint and replied gaily "twelve miles only, but I wired a man to send a trap which will give us a four or five miles lift after we get to the main road." With both lanterns alight, we turned our faces to Barnsley. No vehicle met us, we examined the dusty road for wheel marks, thinking it just possible he might have driven past the trysting place, no trap had been there, so we walked gently on listening for its coming. On reaching the village of Wortley, we knocked the owner of the trap up, and got some refreshment but no vehicle, on leaving we took a near path (?), missed our way, tried back, got right, and were talking about old friends as we jogged along, one lantern still burning, when without the slightest notice "Na then whot are yo chaps afture," and twelve gamekeepers stood around us with arms uplifted, "whot are yo up to?" I replied we are off to Barnsley. "We'll see about thot!" "Oh, well if there is any questions about it let us sit down and discuss the matter," and suiting the action to the word I sat down, by this time the head keeper recognised Mr. Rose, and both sat down; and the others seemed as if

a rest would have suited them as it did me. After half-an-hour's chat I got up and giving them the price of a gallon of ale I started down the road, Mr. Rose doing the same, we got the blessing of the keepers and directions for the best road; in less than half-an-hour we found ourselves wrong again, there being no gate where we expected, so we tried back again and found the proper road, trudging on, talking of the beautiful collecting ground we were passing through. Mr. Rose remarked he knew where the yellow balsam (*Impatiens noli me tangere*) grew near here, and at half-past one a.m. it was suggested we should go and examine it for traces of *Cidaria reticulata*. Mr. Rose found the plants without any trouble in a wood, fine, and in abundance; but as they were only just coming into flower (no seed pods yet) we left, promising ourselves a later visit. We were soon on ground well known to Mr. Rose, and set off briskly for Barnsley, reaching there soon after 3 a.m., having spent a successful, episodic, and pleasant night in and about Wharnccliffe Wood, in August, with the following results:—

Triphæna fimbria. Type, pale.

Apamea connexa. Fine and freely, say about 30 good specimens fell to my share.

Noctua glariosa. A few.

„ *festiva*. A few.

„ *plecta*. Very fine.

„ *dahlii*. Plentiful.

„ *baja*. Wasted, but one variety secured, grey, and entirely wanting the usual dark mark near the top of the wing.

Clwantha solidaginis. Two, this is the first time I ever saw this insect at sugar; it is usually taken at rest upon walls or rails.

Cosmia trapezina. Swarmed. Two bright red varieties were secured.

Orthosia suspecta. Beautifully marked forms. Var. *congenor*, the unicolorous form was most abundant.

Amphyra tragopogonis. Fine as bred, in plenty.

Only one Geometer was seen in the wood whilst sugaring, *Cidaria immanata*, a single specimen; and only one other species was seen as we beat the hedges on our way home, *Larentia didymata*. A single specimen of *Eudoria ulmella* (wasted) came to sugar, but not even a common Crambus of any kind was seen. The night was dark as erebus, and all we could wish for. Insects were abundant at sugar, but absolutely absent amongst the herbage.

ANOTHER VISIT TO LUNDY.

By JOHN HENDERSON.

(Concluded from page 183.)

The climate of Lundy is moist, and except during the very severe winter gales, it must be a pleasant though exceedingly lonely place to live in. There is always plenty to be seen on a fine day from the number of ships passing constantly from Bristol, Cardiff, Swansea, and other ports in the Channel. It is estimated that more than one-fifth of the shipping in the United Kingdom pass into the Bristol Channel; a million sail annually went by as long ago as 1876. But the prevalence of sea-fog, renders it difficult to see them in dull weather, and the Lloyds' signalman stationed on the Island, has been known to have a fortnight's rest, without getting sight of a passing vessel. There is a cable laid over to the Devonshire coast, by means of which immediate notice is given to Lloyds' at the Royal Exchange of any ship that wishes to signal her name, and much delay to the owners and friends is consequently saved.

The soil on the Island is of various depths, and of different characters; it has suffered by frequent burning of the grass and heather, which has in some places destroyed the earth down to the bare rocks. There is a black vegetable mould, clay, peat, bog, and two light friable soils, one sandy and the other suitable for cultivating vegetables. At the north end is a considerable guano bed, formed by the numerous wild fowl who have frequented that part for ages.

Returning to our collecting, we find another butterfly that is not so numerous as on the mainland, the Gatekeeper or small meadow brown (*H. tythonus*), they flit about on the heather-covered slopes in the neighbourhood of the Limekiln and Punch Bowl. The Meadow Browns (*S. janira*) were scarce, and rather pale, like the discoloured varieties we so often see in fields at home. Down by the little landing place, and on the road leading up the cliffs to Mr. Heavens' residence we got a coup'le of *Vanessa urticae*, nothing differing from the usual type we take everywhere. I think there are but few Sphinges on the Island, at least we did not see any with the exception of the Humming-Bird Hawk (*M. stellatarum*), one of which in a worn condition was hovering over some scarlet flowers in a garden. A dark Arches (*X. Polyodon*) was discovered, and a solitary *M. brassicae*; the only Geometrae found were *Acidalia aversata* and *Boarmia repandata* a very pale variety, and the Treble Bar (*A. plagiata*), usually a chalk-loving insect, but which is found freely on the slate in Devonshire, on the cliffs facing the West. Mr. Waterhouse, of the British Museum, once found *Calosoma sycophanta* amongst

some unnamed insects, and besides this there is a new and unnamed species of *Psylloides*, which occurs apparently only at Lundy.

The Botany of the Island is peculiar, the moisture, and entire absence of frost (the climate being the same as at Scilly), being in favour of a rapid growth of vegetation, while the terrific winds which prevail keep down the development, and makes most parts of the surface a barren expanse of granite and moss. In sheltered parts fuschias grow in hedges, the *Hydrangea* and rhododendron thrive well, and the gazania lives through the winter. Other plants are the bracken, which covers some parts of the East coast, *digitalis* (Foxglove), thrift, heather, &c. The furze is not *Europæus*, but a dwarf form, *Nanus*.

The granite of Lundy was worked by a company in 1863, and a very large quantity was used in the Thames Embankment and other places, but the great difficulty of carriage proved insurmountable, and the work was finally abandoned. In the olden times Lundy granite was used in the churches of Cornwall and Devon, so it must have been quarried long ago.

No minerals are worked, but the following have been observed, copper ore, garnet, mica, rock crystals, fluor, and felspar, with some small crystals of beryl. China clay is occasionally met with, and quartz in the slate in every direction. One half of the Island is of granite formation, and the other of slate, thus partaking of the characteristics of the opposite coasts of Wales and Devonshire.

Altogether, Lundy is a strange out of the way place, and well worthy of a visit to anyone with a little time to spare.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 7, 1887.—Dr. SHARP, President, in the chair.

Mr. Arthur Sidgwick, M.A., Fellow of Corpus Christi College, Oxford, of Woodstock Road, Oxford, was elected a Fellow of the Society.

Mr. Jenner Weir exhibited a living larva of *Myrmeleon europæus*, which he had taken at Fontainebleau on the 6th August last.

Mr. Elisha exhibited a series of bred specimens of both sexes of *Zelleria hepariella*, Stn.; and also, on behalf of Mr. C. S. Gregson, a series of eighty varieties of *Abraxas grossulariata*, selected from the specimens bred during the year 1886, from 4000 larvæ obtained from eggs laid by selected varieties, the result of crossing and interbreeding for more than twenty years.

Mr. Stainton remarked that the female of *Zelleria hepariella* had until lately been considered a distinct species, and was known as *Zelleria insignipennella*, but directly Mr. Elisha began breeding the insect its identity with *Z. hepariella* was established.

Mr. Tutt exhibited specimens of *Crambus alpinellus*, *C. contaminellus*, *Lita semidecandriella*, *L. marmorea* (dark forms), and *L. blandulella* (a new species), *Doryphora palustrella*, and *Depressaria yeatiana*, all collected at Deal, during last July and August.

Mr. Stainton observed that *Crambus alpinellus* was so named from the earliest captures of the species having been made on the lower parts of the Alps, but that it had since been found on the low sandy ground of North Germany, and its capture at Deal quite agreed with what was now known of the distribution of the species in Germany. It was first recorded as a British species by Dr. Knaggs, in 1871, from two specimens taken at Southsea by Mr. Moncreaff. Mr. Stainton further observed that he had named Mr. Tutt's new species "*blandulella*" from its similarity to a small *Maculea*, of which one of the best known synonyms was *blandella*. He also remarked that Deal was a new locality for *Doryphora palustrella*, which had hitherto only been recorded from Wicken Fen and the Norfolk Fens in England, and from the neighbourhood of Stettin on the Continent.

Mr. Waterhouse exhibited on behalf of Mr. Coote, a variety of *C. phlaeas*; also a number of *Stenobothrus rufipes*, and three specimens of *Coccinella labilis*, recently taken by himself at Herne Bay.

Mr. Martin Jacoby exhibited several species of *Galerucidae*, belonging to a genus which he proposed to call *Neobrotica*, closely resembling in shape and coloration certain species of *Diabrotica*, but differing therefrom in structural characters. He remarked that the late Baron Von Harold had described a *Galeruca* from Africa, which, except in generic characters, exactly resembled the South American genus *Dircema*.

Dr. Sharp communicated a paper, by Mr. Thomas L. Casey, "On a new genus of African *Pselaphidae*."

Mr. Bridgman communicated a paper entitled "Further Addition to the Rev. T. A. Marshall's Catalogue of British *Ichneumonidae*."

Mr. Distant read a paper entitled "Contributions to a knowledge of Oriental *Rhynchota*."

Mr. Enock read notes "On the Parasites of the Hessian Fly," and exhibited specimens of injured barley. A discussion ensued, in which Dr. Sharp, Mr. Jacoby, Mr. Billups, Mr. Waterhouse, and others took part.—H. Goss,

Hon. Secretary.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY
SOCIETY.

August 25th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Mr. Cooper exhibited *Argyrolepis æneana*, from Essex. Mr. Mera, examples of the summer emergence of *Tephrosia crepuscularia*. Mr. West, *Acidalia ornata* (bred). Mr. Sheldon, *Catoptria candidulana*, *Retinia buolianana*, and *R. pinicolana*. Mr. Wellman, *Agrotis curshria* from Burton-on-Trent, *Noctua festiva*, var. *conflua*, from Perth, and *Plusia orichalcea* (*Chryson*, Esp.), from Newmarket. Mr. Dobson, *Liparis monacha*, *Selenia illustraria* (*tetralunaria*, Hufn.), *Ennomos erosaria*, *Amphipyra pyramidea*, &c., bred from larvæ obtained at the New Forest. Mr. Barron, a large specimen of *Polyommatus phlæas*, with broad border to forewings. Mr. Tugwell, *Boarmia abietaria*, bred from larvæ beaten out of yew. Mr. Tutt, a *Gelechia* of doubtful species; a short series each of *Depressaria yeatiana*, *Doryphora palustrella*, *Crambus contaminellus*, *C. alpenellus*, dark forms of *Lita marmorea*, and a new species *Lita blandulella*, also a blackish *Depressaria*, which Mr. Tutt stated could not be identified as belonging to any of our known British species. Mr. Sabine, *Lycæna alexis* (*icarus*), males of varying blue tints, blue females, and a dwarf male barely three-quarters of an inch in expanse, underside with confluent spots, and an underside of male with left wings normal, and right wings of the obsolete type; also males of *L. adonis*, various shades of colour, and females more or less blue; a fine series of Hybrids (?) male and female between *alexis* and *adonis*; and forms and varieties of *L. corydon*. Mr. Billups read a letter from Mr. Cockerell, giving notes on the fauna of West Cliff County, Custer, Colorado, and exhibited specimens of lepidoptera from that district.

September 8th, 1887.—T. R. Billups, Esq., F.E.S., in the chair. Mr. J. T. Williams exhibited a small specimen of *Platypteryx hamula* (*binaria*, W.V.), and remarked on the number of dwarfed specimens of lepidoptera to be seen this year, which he attributed to the dryness of the atmosphere and consequent dryness of the food-plants; a discussion ensued in which Messrs. Billups, Carrington, Wellman, and others took part. Mr. Williams also showed a specimen of *Sphinx convolvuli*, taken by him that morning at Crayford, and asked whether the species deposited its eggs in the autumn or spring, and in reply Mr. Carrington said he had never heard of any hibernated specimens of the insect being captured in the spring, and would conclude from that, that the ova were deposited in the autumn. Mr. Sheldon exhibited long series of *Agrotis agathina* and *Noctua castanea*, taken on heather flowers, at Shirley. Dr. Rendall, *Apamea gemina* and *Hadena suasa* (*dissimilis*, Knoch), and contributed notes, Mr. Wellman, varieties of *Zygæna filipen-*

dulæ, from Dover. Mr. Dobson, *Emmelesia albulata*, var. *thules*, and various species of Tortrices from the Shetland Isles. Mr. E. Joy, two melanic varieties of *Vanessa urticæ*, bred from larvæ found at Folkeston. Mr. Tutt, varieties of *Agrotis tritici*, taken at Deal, 1887. Mr. Carrington, pupa of *Dicranura vinula*, formed among cotton wool. Mr. Billups stated that several larvæ of this species had been found in the churchyard of St. Saviour's Church, Southwark. Mr. West (Greenwich), *Rhantus pulverosus*, *R. notatus*, the red variety of *Agabus bipustulatus*, and *Philonthus punctus*, all from Erith. Mr. Carrington, specimens of the Hessian Fly (*Cecidomyia destructor*), and a discussion took place as to the probability of this insect becoming permanently established in this country. Mr. Billups exhibited on Mr. Cockerell's behalf species from County Custer, Colorado, and contributed notes.—H. W. BARKER, Hon. Sec.

CLYDESDALE NATURALISTS' SOCIETY.

The first meeting of the fifth session was held on Wednesday evening, 21st September, in the Society's Rooms, 207, Bath Street, Glasgow. Mr. T. J. Henderson, President, in the chair, The following gentlemen were proposed as members:—Messrs. James S. Dixon, W. Hannan Watson, and A. M'Laren. Nominations for the various offices which now become vacant were lodged with the Secretary for election at next meeting. Mr. Robert Dunlop exhibited a specimen of a fossil scorpion from the coal measures of Airdrie, which is believed to be the finest and most complete of the kind yet discovered. The first recorded specimen of a fossil scorpion was found in Bohemia, and is mentioned in Buckland's "Bridgewater Treatise," but since then scorpions have been found at various times in both the silurian and carboniferous formations in England. They are usually found among plant remains in the coal measures. Mr. John Mackay exhibited a specimen of the large tortoiseshell butterfly (*Vanessa polychlorus*), taken near Castle Sweyn, in Argyllshire, in July last. This species, which is extremely rare in the North of England, has only once before been recorded as occurring in Scotland, and this is the first specimen that has been found in the West of Scotland, being thus an interesting addition to our fauna. The specimen was of the usual normal type. Mr. A. A. Dalglish exhibited a very fine collection of lepidoptera from the island of Arran, including such rare species as *N. dictæoides*, *G. papilionaria*, and uncommon forms like *C. silaceata*, *M. hastata*, *O. cambriaria*, &c. Mr. John M. Campbell showed two species of New Zealand parrots *Nestor meridionalis* (G.M.), and *Strigops habroptilus* (G. R. Gray), both of which are rapidly becoming extinct in that island. The former species has developed a peculiar liking for mutton fat, to satisfy which it

attacks the sheep, devouring the fatty part surrounding the kidneys and leaving the poor animals to die miserably. The farmers consequently wage such a war upon the parrot tribe that many species are soon likely to become extinct. The latter bird is nocturnal in its habits, and, feeding principally on roots, is quite harmless to the farmer. Mr. Campbell also showed eggs of European Water-tortoise *Emys Europæa*, Schu., deposited by specimens in Kelvingrove Museum; and the claw of a Norwegian species of crab showing a peculiar malformation. Mr. John Young, F.G.S., exhibited a specimen of *Elaterite*, or flexible bitumen, a hydrocarbon mineral found in fissures in the carboniferous limestone at Castleton, Derbyshire, and stated that it had only been found in two localities in Scotland, and was rare in all the countries of the world. Mr. Robert Dunlop showed a species of *Chelifer* found in old paper at Airdrie; and Mr. Robert Pettigrew specimens of *Caropata*, a poisonous parasite, from Brazil, which he exhibited under the microscope. Mr. Alex. M. Stewart showed a number of lepidoptera from Argyllshire and Arran, some of which were striking varieties. Some species from Arran were much darker in colour than those from Knapdale, while others had quite the opposite peculiarity.—JOHN MACKAY, Hon. Sec.

OBNOXIOUS AND INJURIOUS INSECTS.

BY JOSEPH CHAPPELL.

Continued from page 171.

Rhagium indagator is abundant under the bark of pines, especially pine stumps and recently felled trees. It occurs in Scotland and Shropshire, in the latter locality it is rare.

R. bifasciatum feeds beneath the bark of alders, and frequently other forest trees, also pines abundantly. Some years ago I discovered this species in an old gate post, which lay on the hillside in Stalybushes. An old entomological friend, Mr. W. Worthington, and myself soon demolished what the beetles had left, which was very little. I was afterwards informed that the owner of the gate said we had spoiled the post, however, to make amends, I think we had saved some of the other posts, besides alder trees in the district; we found several alder trees infested with this species.

Taxotus meridianus occur on ash and oak trees, in the interior of which it feeds, it also occurs in old hedges, and may be seen on the wing in the hot sunshine.

Pachyta collaris are found on flowers in the South of England,

P. cerambryciformis are found on flowers, especially umbelliferæ, near Manchester.

P. sexmaculata are found on flowers in Scotland, it is very rare.

Strangalia aurulenta are found in old stumps in the New Forest, Swansea, and north coast of Devon.

S. quadrifasciata is found in old trees in Sherwood Forest.

S. maculata is abundant on the flowers of umbelliferæ.

(To be continued.)

NOTES AND OBSERVATIONS.

L. ICARUS AT HOY.—I have led all my readers astray in this matter and must cry *mea culpa*. Mr. Dale (see supplement p. 72.) called Hoy “the most Northerly of the Shetlands.” It was this slip, and not the occurrence of *Icarus* at Hoy that Mr. Curzon wrote to correct. Hoy is one of the Southern Orkneys, and the passage on page 72 should read:—

This is the commonest of all the Blues, abounding in meadows, on heaths and downs, and not at all confined to chalky soils like its congeners, and occurs all over the British Isles, from the Orkney Islands, where it has been met with both on the main Island and at Hoy, to the Lizard Point, in Cornwall.

On the same page is another blunder. The second paragraph ought to read:—

The egg is circular and of a greenish-white colour, with raised glistening white reticulations having projecting knobs at the knots.

The caterpillar when full grown, is of a dark green colour covered with tiny hairs, &c.

This blunder is mine.—J. E. ROBSON, Hartlepool.

LYCÆNA ACIS.—Some of the last few specimens of *L. acis*, that were taken in this country were not mentioned in the issue of the Y.N. for July, unless Mr. Pearson’s remark on page 137 is intended to refer to them. In July, 1877, the hot year that the Clouded Yellows (*Edusa*) were so abundant, two brothers residing at Penarth, the Rev. C. Roberts, of Oxford University, and E. Lloyd Roberts (afterwards a member of the Haggerston Entomological Society), sons of the late Captain Roberts, of Cardiff, took six specimens of *Acis* in one spot at Penarth, but notwithstanding many more searches they could not find them another season. When Mr. E. Lloyd Roberts left for New Zealand he gave one specimen, which has twice been exhibited at Haggerston, and probably is the cause of the note above referred to. It is a fairly good example, very low set; the remainder were in the Rev. C. Roberts’ collection at Fulborne, Cambridge, some time ago; I saw him last

summer and the year before at Ilfracombe.—JOHN HENDERSON, Herne Hill, S.E.

SATYRUS ÆGERIA TYPE.—As the occurrence of the orange-coloured type of this butterfly in Britain is sometimes questioned, I would say that I took an example of it in June, 1884, at Dinedor Wood, near Hereford.—E. W. BOWELL, Chandos House, Hereford.

CONVOLVULI IN YORKSHIRE.—I had brought to me four *Convolvuli* between the 28th of August and the 3rd of September. I then thought it time to look for them, and on the 5th of this month I netted three fine imagines, and one each on the following three evenings, all in good condition. Since then the evenings have been cold and stormy, and I have not seen any since the 8th, but intend to have another look the first fine evening. I think it rather odd that there is only one male out of the ten.—GEORGE ROSE, Queen Street, Barnsley.

SPHINX CONVOLVULI AT CAMBRIDGE.—Two specimens of this hawk-moth have lately come into my hands. One was captured on the 19th of August, having flown into a house near here (Mill road). It was in splendid condition and apparently just emerged. The other was knocked down by a boy with his hat, a few days ago as it was flying on the Newmarket road, just outside the town. Its captor assured me he had seen two others near the same spot, but was unable to secure them, being unprovided with a net.—ALBERT H. WATERS, B.A., Mill road, Cambridge, Sept. 15th.

LUPERINA CESPITIS IN THE COUNTY OF DURHAM.—When my friend, Mr. Gardner, told me of his capture of *L. cespitis*, I had no doubt it was new to the county, but on referring to the lists of the late Wm. Backhouse, of Shotley, which are in my possession, I find that he took it at Shotley, as far back as 1838. It was also taken (1873-5) by Dr. F. A. Lees, in Upper Teesdale. The error was mine.—JOHN E. ROBSON, Hartlepool.

AUTUMN LEPIDOPTERA AT AIRDRIE.—On Saturday, 10th September, I paid a visit to Airdrie to see some entomological friends, and if possible to take a few *C. Haworthii*, which some seasons is very common on the moors in the neighbourhood. On Saturday we tried the moss at Whiteriggs twice, but with indifferent success. Owing to the heavy rain of the two preceding days, the moss was a perfect marsh, and collecting was attended with many inconveniences. We saw a good few *Haworthii* flying in the sunshine, but the nature of the ground made it difficult to follow them without coming to grief. However, we each managed to take some specimens, although several of them were pretty much worn. *N. fulva* was also on the wing, and a number of very fine specimens were netted. In the evening *C. testata* was

pretty common, flying at the same time as *fulva*. *O. antiqua* was flitting about in the sunshine, while its cocoons were very plentiful on the heather. Several specimens were netted of the large dragon fly *Aschnia juncea*, which seems to be common in this locality.—JOHN MACKAY, Kingston, Glasgow.

EARLY EMERGENCE OF C. XERAMPHELINA.—*Xerampelina* has made its appearance much earlier than usual. I unexpectedly found one emerged on the 9th August. As I never found it earlier than the 22nd before, I had no idea of looking for it so early, but it was on a tree on the side of the York high road, and I could not help noticing it. I have since sought it every day, often taking a long walk. I visited Steningford Park on Saturday, doing about fourteen miles. I have been fairly successful, and have obtained another dark variety, not, unfortunately, in fine condition. If I had not seen it by accident on the 9th I would have missed the species, as I would not have commenced to look for it before the 22nd, by which date I believe they were all out this year.—T. MELDRUM, Ripon.

IMPOSITION.—I have always been greatly pleased with the Editor's action in this matter, and now that he has brought it again forward, the following item of news may be useful. When at Folkestone a well known entomologist showed me a letter from a Continental dealer offering *Catephia alchymista* pupæ, at the marvellous sum, if I remember rightly, of 1/6 each. I see one has already been bred on the South coast (Y.N. p. 171). I dare say many entomologists will have a full series of duly authenticated Britishers in the course of a few weeks, or months at the most. A few other species were mentioned in the letter of a similar class, but they have not been chronicled from a British locality yet.—J. W. TUTT, F.E.S., Westcombe Park.

AN UNKNOWN LARVA ON CABBAGE.—I would suggest that Mr. Gregson's cabbage feeding larvæ (Y.N., page 179) are those of *Pionea forficalis*. They feed here freely on cabbage, turnips, horse-radish, and other garden produce.—GEO. T. PORRITT, Greenfield House, Huddersfield.

I suspect the larvæ Mr. Gregson has found in the cabbage will turn out those of *Pionea forficalis*. A friend of mine bred a considerable number of them from a cabbage some years ago, and I have some of them in my cabinet.—FRED. BOND, Staines, Middlesex.

SEMARIA WÆBERANA.—Early in June last, my attention was called to a most beautiful little moth sitting on my dining room window. It was a fine female *S. wæberana*, and much speculation followed how this Southern insect could have got here; a few days later another specimen was secured in the same window. Later another, and I went into the garden prospecting, when I disturbed and secured another. After examining the apple trees carefully

for traces of its larva unsuccessfully, I turned to plum trees, without result; as a last resort I tried pear trees, and upon the last one I examined (a tall tree 25 feet high), I thought I could see something ten or twelve feet above the ground, so got a ladder, and for five or six feet above the first seen traces, the bark was covered with small patches of frass, through which were scores of pupa-cases projecting outwards. The enigma of finding specimens of *S. wæberana* in my room was solved, as from one of the pupa-cases a fine specimen of the moth was just emerging. Taking my ladder to another tree I found a few frass marks high up, and two moths sitting on the underside of the lower branches. This sent me back to the first tree to examine the lower branches upon it, again I found more perfect specimens. In practice I found them so difficult to box, sitting, or to net flying amongst the branches, as I stood upon the ladder, that I decided to saw a number of the lower branches off, and so bred them out indoors. This proved quite a success, as did digging the pupa out where frass shewed itself without any pupa-case shewing upon the trunks of the trees. The principal tree for them is a "Maria Louise," which I planted forty years ago, the other a Jargonelle of the same age was only slightly attacked, whilst four other sorts of pears and the apple and plum trees in the garden—all of the same age, but not from the same nursery originally—have had no larvæ upon them up to now, yet these larvæ must have been imported with the trees forty years ago, and have reproduced their species over all that time in my garden, under my nose, and I never saw them before. Truly, how little individually we know.

NOTE.—In all books to which I have access this species is given as an apple or plum feeder. In Westwood and Humphry's "British Moths," Pl. 86. Fig. 7, 8, 9, 10, 11, it is figured fully but crudely, and described as feeding "beneath plum bark which it loosens and injures the tree," and again "Mr. Spence found it in apple orchards." Other writers (compilers) have copied this. I have repeatedly read it, so never examined pear trees for the species, and it seems a little strange to me now that after forty years, in a small garden like mine, with apple, plum and other sorts of pear trees growing close around, they have never gone to live upon them, but remain numerous upon the imported trees they must have been imported in or upon.—C. S. GREGSON, Rose Bank, Fletcher Grove, Liverpool.

SIREX JUVENCUS AT OLDHAM.—I have a pair of the above species in my collection, taken by my son last July, in a cotton mill where he works. It is supposed they have been brought there with a quantity of timber they have stored in the warehouses, which they use at the bottom of skips, commonly called "skips-clogs."—J. T. RODGERS, Oldham.

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THE LEPIDOPTERA OF A GARDEN.

BY JOSEPH ANDERSON, JUN.

President of the Chichester Natural History Society.

THE idea, I think, is entertained by many collectors of lepidoptera, that in order to obtain a "good haul," it is necessary to go far afield for their insect hunting. Now, inasmuch as all the species enumerated in the following notes, were taken within the circumscribed area of a circle of but few yards dimensions, surrounding my residence, I shall be able to show that this is by no means the case; and that persons, whose amount of leisure is limited, would be able in any suitable locality to prosecute the study, and in time get together a very fair collection.

Firstly then, I will call attention to the Diurnal Lepidoptera, which visited our garden. The beautiful *Colibris edusa* (the Clouded Yellow) was one of these. One must not, however, expect to meet with this insect every season, as its appearance is capricious and uncertain. A.D. 1877 will be long memorable as the *Colibris edusa* year. Probably never before had this favourite butterfly swarmed to such an extent in this country, turning up as it did in localities where it had never previously been observed. Now for nearly ten years, only stragglers here and there have been noticed, upsetting the septennial theory, to which some lepidopterists have attached some importance. The typical form was, in 1877, accompanied by the pretty pale variety of the female, to which Haworth gave the name of *Helice*. Of these, my brother and I then captured 42 fine examples, some of them being taken even in the garden. They varied much in colour, from rich cream and primrose to a dingy white, the marginal spots also presenting great dissimilarity in size, in one or two specimens being nearly obliterated.

I need hardly say that the three species of *Pieris*—*brassicae*, *rapae*, and *napi*—were to be seen disporting themselves, both on sunny and dull days in

their season; the females of the two first were very busy in depositing their eggs on cabbages and other plants, to hatch in due time into larvæ, to be served in due course at table with our cauliflowers, in order to add a zest to the meal. *Anthocaris cardamines* was at times a not unwelcome visitor.

Of the Vanessas, I may mention *Urticæ*, *Polychloros*, *Io*, *Atalanta*, and *Cardui*. I would here allude to two or three plants which form especially attractive baits for this family, to wit, a species of *Sedum*, and the herbs thyme, marjoram, &c. My good friend, Mr. Alfred Lloyd, of the Dome, Bognor, has a bed with a quantity of the *Sedum* in front of his house, and on sunny days the flowers are frequented by swarms of Tortoiseshells (*Vanessa urticæ*), Peacocks (*Vanessa io*), &c., which become so tame that they may be taken gently between the fingers, detained for a while, and then replaced upon the flowers. I am disposed to surmise that the honey has somewhat of an intoxicating, or soporific effect upon them, producing an apparent tameness.

Pararge (Pyrarga) megera was common about a sunny bank, looking so strangely like a Fritillary. This with *Epinephele janira*, *E. tithonus*, and *Cænonympha pamphilus*, formed the little band of Satyrs.

Polyommatus phlæas, in glittering copper, flashing in the sun, was not unfrequent in its visits, in company with its near relatives the Blues, *Lycæna ægon*, bright with silver studs; and the more beautiful but common *Lycæna icarus*, *L. agestis (astrarche)*, in sober brown, dull, and out of place amongst his congeners in their azure mantles gay, was there too.

The Skippers, the curious connecting link between the true butterflies and moths, were represented by *Hesperia linea* and *sylvanus*.

We now come to the Moths (Heterocera). Amongst the group of Nocturni, I have seen and captured the charming Eyed Hawk-moth (*Smerinthus ocellatus*), the Lime Hawk-moth (*S. tilicæ*), the Privet Hawk-moth (*Sphinx ligustri*), the Humming-bird Hawk-moth (*Macroglossa stellatarum*), gracefully poised at dusk on rapidly vibrating wing, over the corolla of some attractive flower, whilst with extended proboscis it sucks the honey from its mouth. And a pigmy amongst giants, in the hottest sunshine, is the curious little Clear-wing (*Sesia tipuliformis*), skimming like a gnat over currant bushes. These make up a fair representative assemblage of the Sphingidæ and Sesidæ.

Plenty of Ghost Swifts (*Hepialus humuli*) were to be seen about mid-summer, flitting over grass "in the gloaming." The eggs of this species when first extruded are snowy white, but quickly turn black upon exposure to the air, when they resemble coarse grains of gunpowder.

In a little shrubbery, the pretty little Muslin moth (*Nudaria mundana*) is to be met with every year, somewhat later in the season, together with the

gay Cinnabar (*Euchelia jacobæa*), the weak flight of which renders it an easy capture. The Tigers are represented by *Arctia caia* (*caja*), the Ermines by *A. menthastris* and *A. lubricipeda*.

I must not forget the delicate Brown-tail moth (*Liparis chrysorrhæa*), a somewhat local species. The larvæ of this species, and of *L. auriflua*, the much commoner Gold-tail, are possessed of remarkably severe urticating properties, and may not be handled with impunity. The hedges near the canal literally swarmed with them some seasons ago, their cocoons, too, might have been found in almost every bush of white-thorn, and the pernicious effects of the hairs with which the caterpillar is covered, and which it weaves into its cocoon, were to be felt long after the imagines had emerged. For months I could not beat that hedge for moths without suffering the most intolerable irritation in my hands and face, which were speedily covered with little white swellings. It seems to have been ascertained that the pain is caused by poisonous acid, secreted by a gland at the base of the hairs.

Amongst the Geometers, I may mention *Urapteryx sambucata*, *Selenia illunaria*, *Crocallis elinguaris*, *Ennomos tiliaria*, *E. angularis*, *Amphydasis betularia*, *Geometra papilionaria*, *Acidalia incanaria*.

In the family of the Pyralidæ, I may chronicle the capture of a specimen of the somewhat local *Spilodes palealis*. In out-houses, the pretty little *Pyralis fimbrialis*, is usually more or less common, and at a lamp near the house *Pyralis glaucinalis*, not altogether a rare visitant in the proper season.

Without doubt, the way to catch moths with the least trouble, and one which I did not neglect to adopt, is to smear the trunks of trees, &c., just before dark, with a mixture of sugar, beer and rum boiled together, to which the moths are attracted, and quickly becoming intoxicated may be easily secured in chip boxes of various sizes. I cannot help thinking that "sugaring" does not pay quite as much as it used to do. Moths are getting too wise to be taken in by the saccharine baits, each generation profiting by the experience of its predecessors. Some have lately tried to show that caterpillars are possessed of reasoning powers. I do not see why we should deny the faculty to the perfect insect, so that the time may come when we may sugar indeed; but moths, were they possessed of those members, will but apply "the finger of scorn to the nose of derision." Whether this may be a case of inherited instinct, I leave to my friends the evolutionists to determine. Be that as it may some silly moths did come to my trees last year, and paid the penalty of their indiscretion. To most of them I can but just refer.

Grammesia trilinea was amongst the earliest, followed by the Yellow Underwings *Tryphaena pronuba*, *T. orbona*, *T. interjecta*, *T. janthina*, *Cosmia affinis*, and *C. affinis*. *Apamea oculatea* in wondrous variety. *Noctua plecta*, *N. c-nigrum*, *N. festiva*, *N. dahlia*, and all the Mianas. There were besides both the Quakers, Red and Yellow-line, *Orthosia lota* and *O. macilentata*, and *Xanthia cerago*. *Anchocelis pistacina* was usually a pest. I am sure I could have counted 50 one night at small patches of sugar, affording prime fun for the earwigs, who carried them off in their powerful mandibles as a "bonne bouche" for supper. The two fine-looking *Agrotis*, *A. suffusa* and *sauucia*, were not uncommon. And some tipsy old Ladies (*Mania maura*), in their sober black satins, contrasting sharply with the handsome Red Underwings (*Catocala nupta*), were frequent visitors. But my great prize at sugar was one evening a fine specimen of the excessively rare *Leucania albipuncta*.

And now a word or two about some of the larvæ. About eight summers ago, the elms surrounding the house, were swarming with the caterpillars of the Large Tortoisehell butterfly (*Vanessa polychoros*). This caterpillar is gregarious; upon one small branch which I cut off I counted as many as 40. It is remarkable that during the years which supervened, I have never seen another caterpillar. Nearly every season the larvæ of the Eyed Hawk-moth (*Smerinthus ocellatus*), are to be found upon the apple trees, and searching for these a very unexpected discovery was once made, this being the grotesque larva of the Lobster moth (*Stauropus fagi*). The larva was feeding upon apple, in the autumn of 1881, and upon this plant I reared it, being rewarded with a fine male moth, in the April of the following year.

In the autumn of 1885, the larvæ of that fine moth, *Acherontia atropos*—the Death's Head—were unusually abundant, and several caterpillars, as well as the pupa, were met with in the garden. The larvæ were feeding upon potatoes. Last season not a single caterpillar was detected, neither have there been any (or at least but one here and there), chronicled from other parts of the country. It is noteworthy that very little is known of this grand Sphinx.

The ova of *Bombyx neustria*—the Lackey Moth—disposed in a regular manner, like a necklace round the twigs of apple and other trees, and the larvæ and cocoons under walls, are to be seen almost yearly in abundance.

Of course these notes are but fragmentary. They do not pretend to be a record of all the species observed, but they will serve to show what a fair collection may be formed from, and what pleasure may be derived from the study of "The Lepidoptera of a Garden."

NOTES FROM SUFFOLK.

By F. N. PIERCE, Vice-President Lancashire and Cheshire Entomological Society.

We arrived at Bloxhall, some four miles from Wickham Market station, on September 9th, and left on September 24th. The weather was cold and sometimes wet, the evenings were especially cold. There seemed to be quite a dearth of insects in the day-time (except wasps which were quite a plague, I saw quarts and quarts of them). All the lepidoptera we saw in the day-time were some three or four *Vanessa io*, *urticæ*, and *atalanta*, one of which was discussing the sugar we had laid on the trees the night before for moths, and occasionally a *Catocala nupta*, sitting at rest on the pollard willows, or on the side of a red brick house.

On the 22nd, it was a particularly fine warm day, and we, I regret to say, spent it boating on the river. When we arrived at our friend's house (a description of which you will find in the Y.N., Vol. vii., p. 212), we were greeted with the news that while we were away a grand specimen of *Vanessa antiopa* had settled on the garden walk, and was netted by one of the young ladies, but, unfortunately, it afterwards managed to escape. It is needless to say that we spread sugar and vinegar on every available part of the garden the next day, and kept a good watch, but no *Antiopa*. (N.B.—We were off home the day after that.) On the Friday we had a really fine warm evening, such as entomologists delight in, and very soon we observed that a large moth was swiftly flying over some petunias. What is it? *Convolvuli*! Why certainly. I was sugaring at the time, but Harker was ready. A bang! flowers flew in every direction, and so did *Convolvuli*! (N.B.—We started for home the next morning.)

The ivy was not out so we took nothing at it, but had to content ourselves with sugaring, which was far from profitable, we seldom saw half-a-dozen moths during the whole evening. *Catocala nupta* would be there looking grand. I might just remark in passing one must be alive to secure this in anything like fit condition for the cabinet. A few *Anchocelis pistacina*, *Noctua xanthographa* (very worn), two or three *Amphipyra tragoponis* and *pyramidea*, *Xanthia citrigo*, *Hadena protea* (a rare treat for my eyes), one *Triphæna fimbria*, one *Pyralis costalis*, six *Hypenodes rostralis* (these were very difficult to see on some trees), and *Leucania impura*.

At light, we took one specimen of *Lithosia griseola*, and a few *Eubolia cervinaria*, *Luperina testacea*, and *Hydræcia micacea*. These were the bulk of our captures.

We spent days trying to take *Accentropus niveus*. This species occurred on

a long pit, only separated from the sea by the wall (*i.e.* a long mound of earth to keep the sea from flooding the meadows), but we were too late. Harker found one living specimen, and the remains of many more were floating on the surface of the water. *Cataclysta lemnalis* and *Hydrocampa stagnalis* were common enough about the ditches.

A collector stood beside the lake,
Whence all but he had fled;
He came, *Acentropus* to take
Alive, or if not, dead.

The wind blew fierce, he would not go
Without a search around,
Among the herbage rank that grew
Upon his hunting ground.

Upon his brow the wild wind blew,
And through his waving hair;
Yet still he searched that lonely spot,
In chill, but brave despair.

"Oh, *Niveus!* *Niveus!* must I go,
Without a single take!"

The wintry winds aloud replied,
"It's fragments strew the lake."

With killing bottle, boxes, net,
That well had borne their part;
Without a single specimen
For home he had to start.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

Continued from page 201.

S. attenuata is recorded as occurring on flowers at Salisbury.

S. revestita is recorded as occurring on flowers at Windsor, Colney Hatch and Gamlingay, Cambridgeshire.

S. nigra occurs at Darenth, Ripley, Suffolk, and South Wales.

S. melanura is found in hedges in Burnt Wood, Staffordshire, and generally distributed in the South of England.

Leptura virens is recorded as occurring on decayed trees in the Forest of Dean.

L. rufa.

L. scutellata is found in old trees, in the New Forest.

L. fulva is found in old trees, in the New Forest, near Lyndhurst.

L. sanguinolenta has been taken in Scotland, on the trunk of a tree by Mr. Champion.

L. livida is found on flowery banks in the South of England.

Anaplodera sexguttata is found on flowers in the New Forest.

Grammoptera tabacicolor is found on flowers in Burnt Wood and Mlangollen, also in hedges.

G. analis is found in hedges and on flowers, in the South of England.

G. ruficornis, the larva of this species feed in the solid stems of the ivy, where I have found it, and the perfect insect is abundant on the flowers of Hawthorn.

G. ustulata is on flowers in the New Forest.

G. atra? I captured a variety of *ruficornis* at Castle Mill, on Umbelliferæ, which answers this description.

HYMENOPTERA.

Sirices are the most destructive of the wood-eating British Hymenoptera.

Sirex gigas is a very formidable looking creature. The female is armed with a long ovipositor, a suitable instrument for depositing her ova in cracks or crevices of pine trees. It is termed the Terebra or aculeus. This projecting sting (*Aculeus exertus*)—Latreille calls it a terebra—is found in all the Hymenoptera. The chief character by which the terebra is distinguished is by the presence of two exterior valves or sheaths, and the central aculeus or sting which projects. In *Sirex* in which the sting projects, we find likewise the exterior valves and the central aculeus. This again consists of the superior channel, and the bristle lying within it. All three are dilated at the apex, the channel is split, and that portion as well as the bristle upon its entire margin are beset with short serrated teeth, there is a passage in the aculeus, but so narrow that an egg cannot pass down it, and in this cavity how could it move along? The egg merely slides down the superior channel, and is pushed on by the inferior bristle pressing against the channel from the base outwards towards the apex, pushing the egg before it. In all insects provided with an aculeus or an ovipositor, the vagina opens at its base, so that its canal passes directly into that of the ovipositor. The valves and spines of this apparatus are consequently nothing more than the horny bone which lies within the vagina, and which is then prolonged beyond it. The male is distinguished by the absence of these appendages. This insect abounds in Dunham Park and the neighbourhood, where it feeds in larch and *Pinus sylvestris*, also Wellingtonia. The larvæ feed in the interior of the trees. A few Wellingtonia were planted on an estate at Bowdon, they

appeared to do well till they grew to about twelve feet high, when they were found to be infested with insects. One of the trees was sent to the late Mr. Joseph Sidebotham, who succeeded in rearing a number of *Sirex gigas* from it; the interior of the tree was entirely eaten away by insects. In Dunham Park, larch and pine trees are injured very much by it. This insect occurs freely on Chat Moss, also in coal mines freely, having been carried down in the props, which are used to support the roof, and is very likely the cause of the miners occasionally losing their lives in consequence of the props giving way. There is no doubt the above insect is often imported, for it frequently occurs in Manchester and all other towns where foreign timber is used. I have seen it flying on the New Brighton ferry. Miss Ormerod saw this species as it came out of a larch tree, in West Gloucestershire, and captured about twenty in a few hours. At a military store in France, where clothing was placed on shelves made of pine, in which two larva of this insect were feeding; on arriving at maturity they found their progress arrested by trousers, and they bored their way through them before they were detected. At Grenoble, a box containing cartridges was found to be infested with this insect, which had pierced the bullets after emerging from the timber in which the larva had fed; they perished in the attempt to escape. Some years since about 200 fir trees were totally destroyed by it on a large estate in Norfolk.

Sirex juvenicus occurs on Chat Moss freely and Dunham Park, also in Manchester and other towns. The larvæ feed in the interior of pine, &c., and its habits are similar to the preceding species.

LEPIDOPTERA.

Sesia myopiformis larvæ feeds in the stems and branches of apple trees.

S. culiciformis larva is very destructive to young birch, especially where crate wood is grown. It feeds beneath the bark, near to where the young shoots grow on the stumps of birch trees which have been recently felled. It also bores into the young shoots near the base, and betrays itself by the frass which extrudes from the burrows, consequently a great number of young shoots die or become unhealthy, the result is a smaller crop of crate wood. It may be detected by the perforations in the stump and bark which the woodpecker has made.

S. formiciformis larva feeds in shoots of willows, in osier beds, also in the shoots of the long-leaved triandrous willow.

S. cynipiformis larva feeds in the bark of oak in the South and West of England.

NOTE ON BRITISH LIPARIS DISPAR, AND
UPON THE NATIVITY OF CLOSTERA
ANACHORETA NOW IN THE NOR-
THERN CABINETS OF BRITISH
INSECTS.

By C. S. GREGSON.

At page 192, of "The Young Naturalist," for October, 1887, Mr. Tutt very properly animadverts upon the British claims of these two insects now in our English cabinets.

I know little of the modern southern collections, or how they are being supplied now, but I know that the broods of *L. dispar* distributed by Mr. Doubleday, many years ago, were kept up *pure* for very many years by myself and others, and produced splendid large specimens. The females are very large, and have a somewhat zigzag, well-defined band across the middle. Fed upon different foods, the males produced were of various colours, from dark black brown (the old type colour), reddish browns, and whitish specimens approaching the female colour, and having a broad dark cold brown and distinctly defined band across the middle like the females have, and a broad dark marginal band on all the wings (var. *Marginaæ* of my cabinet). Many years ago, a whole brood of this light form were bred from eggs laid by the progeny of the specimens bred from Mr. Doubleday's eggs, sent by him to me; they were dwarfed specimens from want of food and attention. Part of that brood is still in my possession. The produce from them threw back to the original colour, and assumed the usual appearance and size, on being well fed and cared for both in food and *water*. A few years ago a brood of this light variety was bred in the North of England, by a collector of insects. They were large, light, well-marked specimens, and were secured by two dealers. I got some of them from King, of Great Portland Street, they are exactly like the light brood named above, in colour and markings, but are much larger. So much, then, for the specimens of *L. dispar* in the northern cabinets. I should only fill valuable space in the Y.N. if I told how persistently Old Cooper, N. and B. Cooke, myself, and others, kept up these broods long after the species had ceased to be taken at Ongar Park, *its original home*.

Touching *Clostera anachoreta*, this species is generally associated with the name of a gentleman who was once an entomological comet, who lost his tail and passed into the shade as comets are wont to do; but to Old Weaver is

due the honour of its first discovery, and I think it was announced by him in the "Zoologist," under the name of *Canastomosis*. I purchased specimens from him, long before the new light sent specimens north. I exhibited my original specimens side by side with his, at the Northern Entomological Society, and claimed for Weaver his right. Eggs of the then recently discovered Folkstone species were distributed at the meeting, and from these eggs broods were bred year after year, and twice a year, sometimes by myself and others, until the store boxes of the amateurs were full, and the dealers got them for taking them away, and more than once to my knowledge, box and contents. It has been from these duplicates bred from Folkstone (?) captures that the northern cabinets have been supplied, yes, and many a southern one also has specimens set by myself, which I gave by the boxful to a struggling London dealer a few years ago. Whether either of these species are taken now I know not, but I do not doubt *dispar* can still be taken at Onger Park, Epping, if searched for, or that *anchoreta* can be got near Folkstone. Weaver never told exactly where he got his stock in trade, and the amateur dealers are not suspected of doing so to-day!

In the "Entomologists' Annual," 1856, page 31, Weaver's discovery of *D. ebernata—contiguaria* is announced as taken in Wales. He used to post his letters from the place he did not collect his prizes at, thus he used to write from Abergele, a town in North Wales, where of all places in Wales the least collecting can be done around it: but he collected beyond the next station—Llandulus, one of the very best localities for collecting in Wales (lime quarries and coast). If Weaver understood his business so well, *then* may not our amateur dealers have learnt just a little how not to tell exactly in all these years, and so keep *dispar* and *anchoreta* as silver mines in reserve for themselves. In any case, I hardly think the professional dealers in lepidoptera, would care to import species so valueless as *L. dispar* and *C. anachoreta* are, whilst they have the range of rare British species open to them, and which they can and do buy or order on the Continent, for a few fennings, or franks, or krewtzers, and sell for as many shillings or pounds to foolish persons who ask no questions. I had a commercial traveller from a London dealer here recently. He had, I think, every rare species in our lists with him, and showed his stock in the regular way: was a nice man, and I made him comfortable, but told him he was out of place in Lancashire, the Lancashire men being entomologists not collectors. I showed him British specimens against his foreign ones of several species; true, his specimens were set on legitimate Taylor & Co's. pins, and in English style, but the difference was so perceptible, that he observed "I am told to sell them as British!" This brings me back to *L. dispar* and *C. anachoreta*. Though the first varies

so much here on different foods, I have never seen any English specimens like the Belgium, French, and German specimens I have seen; true odd ones have approached ours, just as some French or German men are somewhat like English men, but he is a dull dog who can't see a foreign man is not English, or an English insect is not like a foreign one. There is a mealy whiteness about foreign *anachoreata*, just like the mealy whiteness on foreign *Ilicifolia*), which I have never seen on English specimens *anachoreata*, or upon English fed and bred *Ilicifolia*.

To sum up, then, I think we may fairly acquit the dealers as dealers of importing such valueless species as *L. dispar* and *C. anachoreata*. If any importation of these species is being done, I think it must be ascribed exclusively to the amateur dealers. In any case, such notes as Mr. Tutt's, referred to above, are invaluable, as they show that the eye of the public is open, and so tend to check the practice referred to. In the old northern cabinets are full sets of purely British specimens of both these species. There is no doubt, we are more particular as to the nativity of our specimens in the north than some of the London insect collectors are. Nevertheless, a local collector being in Belgium to see his father some years ago, brought some *dispar* and other British species here, and bred them for exchanging with, but he could not get his neighbours to look at them, other persons being on the continent have doubtless done likewise, hence the necessity for keeping a close watch on such practices.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 5, 1887.—Dr. Sharp, President, in the Chair.

Mr. Jacoby exhibited a specimen of *Aphthonoides Beccarii*, Jac., a species of *Haltica* having a long spine on the posterior femora. He also exhibited a specimen of *Rhagiosoma madagascariensis*, and remarked that it had the appearance of a Longicorn.

Mr. Stevens exhibited a very dark specimen of *Crambus perlellus* from the Hebrides, which its captor supposed to be a new species.

Mr. Porritt remarked that this brown form of *Crambus perlellus* occurred at Hartlepool with the ordinary typical form of the species, and was there regarded as only a variety of it.

Mr. Slater exhibited a specimen of *Gonepteryx Cleopatra*, which was stated to have been taken in the North of Scotland.

Mr. Jenner Weir remarked that although the genus *Rhamnus*—to which

the food-plant of the species belonged—was not a native of Scotland, some species had been introduced, and were cultivated in gardens.

Mr. South exhibited an interesting series of about 150 specimens of *Boarmia repandata*, bred in 1876, and during the present year, from larvæ collected on bilberry in the neighbourhood of Lynmouth, North Devon, including strongly marked examples of the typical form, extreme forms of the var. *conversaria*, Hüb., a form intermediate between the type and the variety last named, and examples of the var. *destrigaria*, Steph. Mr. South said that an examination of the entire series would show that the extreme forms were connected with the type by intermediate forms and their aberrations.

Mr. Poulton exhibited young larvæ of *Apatura iris*, from the New Forest, also eight young larvæ of *Sphinx convolvuli* reared from ova laid on the 29th August last by a specimen captured by Mr. Pode in South Devon. Mr. Poulton said the life-history of the species was of extreme interest, throwing much light upon that of *Sphinx ligustri*, as well as upon difficult points in the ontogeny of the species of the allied genera *Acherontia* and *Smerinthus*.

Mr. Stainton commented on the interesting nature of the exhibition, and said he was not aware that the larvæ of *Sphinx convolvuli* had ever before been seen in this country in their early stages.

Mr. M'Lachlan remarked that females of this species captured on former occasions, when the insect had been unusually abundant, had been found upon dissection to have the ovaries aborted.

Mr. R. W. Lloyd exhibited two specimens of *Elater pomonæ*, and one of *Mesosa nubila*, recently taken in the New Forest.

Mr. Porrit exhibited a series of melanic varieties of *Diurnea fagella*, from Huddersfield, and stated that the typical pale form of the species had almost disappeared from that neighbourhood.

Mr. Goss exhibited, for Mr. J. Brown, of Cambridge, a number of puparia of *Cecidomyia destructor* (Hessian Fly), received by the latter from various places in Cambridgeshire, Norfolk, Suffolk, and Wiltshire. He also exhibited a living larva of *Cephus pygmaeus*, Lat. (the Corn Sawfly), which had been sent to Mr. Brown from Swaffham prior, Cambridgeshire, where, as well as in Burwell Fen, it was stated to have been doing considerable damage to wheat crops.

Mr. Verrall, in reply to a question by Mr. Enock, said he believed that the Hessian Fly was not a recent introduction in Great Britain, but had been here probably for a great number of years. In reply to a further question, he admitted that he was unable to refer to any but recent records of its capture.

Prof. Riley said he was unable to agree with Mr. Verrall, and was of

opinion that the Hessian Fly had been recently introduced into this country. Its presence here had not been recorded by Sir Joseph Banks, by Curtis (who paid great attention to farm insects), by Prof. Westwood, by the late Mr. Kirby, or by any other entomologist in this country who had given especial attention to economic entomology. It seemed highly improbable, if this insect had been here so many years, that its presence should have so long remained undetected both by entomologists and agriculturists. It had been stated that the insect was introduced into America by the Hessian troops in 1777, but this was impossible, as its existence at that date was unknown in Hesse.

Mr. M'Lachlan, Mr. Elwes, Mr. Verrall, Mr. Jacoby, and Dr. Sharp continued the discussion.

Mr. James Edwards communicated the second and concluding part of his "Synopsis of British *Homoptera-Cicadina*."

Prof. Westwood contributed "Notes on the life-history of various species of the Neuropterous genus *Ascalaphus*."

Mr. Elwes read a paper "On the Butterflies of the Pyrenees," and exhibited a large number of species which he had recently collected there.

Mr. M'Lachlan said he spent some weeks in the Pyrenees in 1886, and was able to confirm Mr. Elwes' statements as to the abundance of butterflies. He remarked on the occurrence of Spanish forms in the district, and on the absence, as a rule, of the peat-bogs so common in the Swiss Alps. The discussion was continued by Mr. Distant, Mr. White, Dr. Sharp, and others.

—H. Goss, *Hon. Secretary*.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

The opening meeting of this Society took place of October 6th, and was very numerously attended. The President in a few well chosen words welcomed the members to their new meeting place, and also announced that Lord Walsingham had consented to become a patron of the Society.

Among the many interesting exhibits which circulated round the room, may be mentioned the following:—A very fine series of *B. abietaria* and a variety of *S. janira* by Mr. Barker; a long series of *A. lunosa*, *C. spartiata* and others by Mr. Hanes; bred specimens of *N. plantaginis*, *X. rhizolitha* and *D. cœruleocephala* by Mr. Pearson; while Mr. J. A. Clark again exhibited a very beautiful selection of *L. æsculi*. Varieties of *A. grossulariata*, and some nice *S. dubitata* and *P. bajularia* were in Mr. Goldthwaite's box, and Mr. Levett contributed a very interesting selection of varieties of *S. tiliæ*, some having the markings on the two anterior wings very different from each

other, giving the specimens a curious appearance. Among the coleoptera must be mentioned two very fine specimens of *Sphodrus leucoththalmus*, which were shewn by Mr. Lewcock. The Society's cabinet was well patronised by some of the new members, of whom many were present, and altogether the meeting was a very successful and enjoyable one. Mr Tutt was elected a member.

The meeting of October 20th was even more numerously attended than the previous one, between thirty and forty gentlemen being present. Mr Newbery, Mr. Sheldon, Mr. Tugwell, and Mr. Billups were elected members, and the Secretary read a letter from Sir John Lubbock consenting to become one of the patrons, sending at the same time a donation of books for the library. Mr. Bailey, of Lynwood House, Penzance, was also elected one the patrons. As might be expected a large number of exhibits were made, Mr. Lewcock exhibited on behalf of Mr. Piffard, four specimens of *Donacia dentipes* and four other species. In his own box were *Sericornus brunneus*, from Esher, and a dark var. of *Telephorus bicolor*, from Rainham. Mr. Bartlett contributed an exhibit of *H. abruptaria*, showing three broods obtained in one season, while Mr. Pearson contributed a series of *H. comma*, a species which London lepidopterists will now find more difficult to obtain on account of the restrictions placed upon visitors to its haunts at Box Hill. Mr. J. A. Cooper's box contained a very beautiful rosy form of *N. glareosa* and also a series of *N. neglecta*, ranging from clay colour to deep chestnut brown; while a very interesting exhibit was Mr. Edle's living pupæ of *A. cardamines* together with specimens of *S. chrysidiformis* and *E. octomaculalis*. Another exhibit in the way of pupæ was Mr. Tutt's cocoon of *S. carpini* having two exits formed for the moth to emerge from instead of one as is usual; both outlets seemed quite perfect. Some North American species in papers were shown by Mr. Thompson, the specimens being in very good condition, and a very nice set of the now somewhat scarce *V. C-album* were exhibited by Mr. Lamplough. Mr. Fordham had evidently been doing some hard work after *M. stellatarum* of which species he showed a series, while Mr. Hockett's rich yellow marked vars. of *A. grossulariata* naturally commanded attention. Very beautiful forms of *S. tiliæ* resembling those shown at the previous meeting were brought up by Mr. Clark; and judging by the long series in his box Mr. Goldthwaite has been very successful in rearing the hybernating *P. syringaria*. Among the most interesting exhibits, however, were Mr. Briggs' beautiful and interesting lot of undersides of *L. corydon*, some clear, some very dark, some streaked with rays of black, also very dwarfed specimens of both sexes. Another box contained specimens of *L. corydon*, *L. adonis*, *L. aegestis*, and *L. alexis*, all captured on the 8th September in company, thus

proving that the statement that *corydon* is always over before *adonis* appears is erroneous. Undersides of "blues" were also exhibited by Mr. Barker, chiefly *L. adonis* females, one very curious specimen having the margin of the wing curved in like a "hook tip" the cilia being quite perfect. Want of space forbids the mention of more exhibits. A handsome piece of furniture, in the shape of the lower part of a bookcase, was added to the Society's possessions by the generosity of Mr. J. A. Clark, and the stroke of the President's hammer at ten o'clock broke up a very pleasant and instructive meeting.—J. RUSSELL AND E. ANDERSON, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

September 22nd, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Mr. Jäger exhibited *Stilbia anomala*, from Tenby, *Caltimorpha hera* and var. *lutescens*, from Devon, and stated he had obtained ova of *hera* and now had the larvæ feeding. Mr. Sheldon *Xanthia fulvago* and var. *flavescens*, and remarked on the number of melanic specimens which he had observed in a particular valley in Derbyshire. Mr. Cooper, dark forms of *Ennomos angularia* (*qurrcinaria*, Hufn.), upon which interesting comments were made by Mr. Goldthwaite. Mr. Carpenter, a number of specimens of *Argynnis paphia*, var. *valezina*. Mr. Tutt, *Melanthia rubiginata* (*bicolorata*, Hufn.), var. *plumbata*, from Rannoch. Mr. Oldham, *Dicycla oo*, from Epping Forest; a dark form of *Arctia caja*, and a variety of *Satyrus megæra*. It appeared from the remarks of members that *D. oo*, had occurred freely at Epping and in some parts of Kent. Mr. Skinner exhibited a specimen of *Deiopeia pulchella*, taken at Dover, 1886, a bleached specimen of *Epinephele janira*, and very pale forms of *Zygæna filipendulæ*. Mr. Adkin, bred *Melanippe rivata*, *M. galiata*, and *Anticlea sinuater* (*cucullata*, Hufn.) Mr. Goldthwaite, varieties of the underside of *Lycæna adonis* (*bellargus*, Rott.) Mr. Elisha, *Gelechia hippophælla*, from Deal; *G. vitella*, *Incurvaria capitella*, *Agrotis Ashworthii*, &c. Mr. J. Jenner Weir, *Carpocapsa saltitans*, and living specimens of the larvæ of *Myrmeleo Europæus*, and made some interesting remarks relative to his exhibits. Mr. West, of Greenwich, showed eight species of *Halipus*, taken by him out of one pond; and Mr. Billups, on behalf of Mr. Tugwell, exhibited *Limneria ensator* and *Macrocentrus linearis* var. *pallidipes*, both bred from *Cucullia gnaphalii*; and on behalf of Mr. Turner, two old wedges which had been used to fasten the chairs holding the rails to the sleepers on the London, Brighton and South Coast Railway between New Cross and Forest Hill, containing nests of *Osmia rufa*, and read notes.

October 13th.—The President in the chair. Dr. Rendall exhibited *Xanthia fulvago*, var. *flavescens*, &c. Mr. Jäger, varieties of *Luperina testacea*, from Tenby. Mr. Tugwell, a specimen of *Sphinx convolvuli*, taken at Greenwich; a fine streaked variety and other nice forms of *Spilosoma menthastri*. Mr. Wellman, bred examples of *Acidalia immutata*. Mr. Levett, two varieties of *Smerinthus tilia*. Mr. Oldham, lepidoptera from India. Mr. Tremlin, specimens of *Vanessa urticae*, showing absence of colour and contributed notes. Mr. Jenner, of Lewes, two specimens of *Acidalia immorata*, a species new to Britain, which he stated were taken at Lewes by Mr. H. C. Morris, of that town—the species was a common one on the continent. Mr. South, *Melanippe sociata*, *M. montanata*, from the Hebrides; an apparently apterous specimen of *Zygæna filipendulae*, bred by him at Folkestone, 1885, a specimen of *Z. lonicerae*, appearing to have four antennæ: after some discussion Mr. Tugwell expressed an opinion that the second pair were merely the pupal covering of the antennæ proper, as the insect did not seem to have altogether escaped from the pupa case, part of it still adhering to the head. Mr. South also showed four varieties of *Argynnis selene*, and one of *A. euphrosyne*, and read notes relative to his exhibit and on the result of experiments made by him in reference to the pale spots appearing on certain of the Argynnidæ. Mr. West, Greenwich, *Hydaticus seminiger*, and stated it was twelve years since he last met with this species. Mr. Manger, Hymenoptera from the Brazils.—W. H. BARKER, *Hon. Sec.*

[We record Mr. Jagers exhibition of *Calimorpha hera* because there is not the slightest doubt of his *bona fides*, nor that his specimens were taken by him in Devon, but there is equally no doubt that the insect is not a native and was originally planted there for fraudulent purpose, like the *Cucullia* that were said to have been found at the same place.—Ed., Y.N.]

CLYDESDALE NATURALISTS' SOCIETY.

The annual business meeting of this Society was held on Wednesday evening, October 19th, at 207, Bath Street. Mr. Robert Mason, F.L.S., Vice-President, in the chair. The Secretary read a very favourable report of the progress made by the Society during the past year, and the Treasurer read a statement showing that the financial condition of the Society was very satisfactory. The library still continues to prove of service to the members. The following office-bearers were then appointed to fill existing vacancies:—Vice-Presidents, Messrs. Robert J. Bennett and Robert Mason, F.L.S.; Librarian, Mr. R. S. Sinclair; and Council, Mr. Robert Dunlop. The following gentlemen were elected members:—Mr. James S. Dixon, 8, Kew Terrace, Mr. W. Hannan Watson, 217, St. Vincent Street; and Mr. Alex. M'Laren, 303, Paisley Road. Two new members were proposed. Mr. Robert Mason,

F.L.S., exhibited a number of finely-mounted specimens of the genus *Plantago*, including a specimen of *P. lanceolata*, showing abnormal variety, regarding which he made some interesting remarks. Mr. John Mackay exhibited a number of uncommon local lepidoptera, taken by Mr. T. J. Henderson, at Garelochhead and Dunblane, among which were *N. dictæoides*, *C. umbratica*, *E. erosaria*, *N. neglecta*, *T. interjecta*, &c., and some rare micros from Possil Marsh, Hillhead, and Milngavie. Mr. D. C. Glen, F.G.S., exhibited a very fine specimen of opal, of great brilliancy, from the famous mines in Queensland; and also specimens of crinoid heads, and the head and stem of *encrinite* from the Silurian formation at Dwbley. Mr. John Young, F.G.S., exhibited a beautiful and interesting specimen of a pied blackbird, *Turdus merula*, in which the plumage is finely blotched with patches of pure white feathers. He stated that this specimen was presented to the museum by Miss Lizzie Alexander, Dowanhill Gardens. It had frequented the gardens for two or three years, and was known to many of the frequenters; but in March, 1885, it was found dead under one of the hollies, having been wounded by some person. Mr. Young also exhibited a white variety of the song thrush, *Turdus musicus*, shot on September 24th, of this year by Dr. R. B. Young, at Westercraigs, Linlithgowshire. The exhibitor stated that this was the first example of a white variety of the mavis that had come under his notice, and the occurrence seems to be very rare. Mr. E. C. Eggleton exhibited a number of eggs deposited by a specimen of the smooth snake in one of show-cases in Kelvingrove Museum. Mr. C. B. Cross showed some very interesting aquatic objects from the Clyde, demonstrating the development of certain species suitable for the aquaria; and Mr. Robert Dunlop exhibited under the microscope a peculiar form of parasite found on minnows in his aquarium. The meeting adjourned till November 16th.—JOHN MACKAY, *Hon. Sec.*

NOTES AND OBSERVATIONS.

NOTES ON BUTTERFLIES, IN 1887.—The past summer has been an unusually good one for butterflies. *P. rapæ*, *P. napi*, and *P. brassicæ* have been excessively numerous, far more so in fact than we ever remember. *V. C-album*, which for several seasons had been very scarce in this part of the country, began to appear again in 1886, in its former numbers, and this year has been still more plentiful. *P. megæra*, *H. tithonus*, and *P. phlæas* were more common than they have been during the last few years, while *V. io* and *V. atalanta* were as usual very numerous.—(Miss) R. PRESCOTT DECIE, Bockleton Court, Tenbury.

VANESSA C-ALBUM.—It is with pleasure we are able to record the occurrence of the above species in its old haunts during 1887, in as large numbers as we were favoured with in 1886. In this latter year it was noteworthy that of above 500 pupæ brought us from the hop-grounds only one was tentated by ichneuomons, this led us to foretell that in this year the species would be likely to appear again plentifully, therefore we were prepared to see hibernated specimens on the wing as soon as warm days came in the spring. Freshly emerged insects were on the wing in June, and again in early August, and in September when the hops were gathered, larvæ and pupæ were plentiful, and out of nearly 600 pupæ only two have been ichneuomoned. May we not therefore hope that in 1888 this lovely butterfly will again be numerous.—(Mrs.) E. S. HUTCHINSON, Grantsfield.

ACHERONTIA ATROPOS.—Several entomologists having complained of the difficulty they meet with in rearing imagines of the above species of the above species from larva and pupa, I venture to advise a plan I have found most successful. In 1886, four larvæ were found here and brought me. One was feeding on potato leaves, the other three were dug up, they had buried, and formed most curiously domed cocoons, very large and so friable it was impossible to prevent their breaking up. The three matured larvæ were placed on damp earth in flower pots, and covered with damp moss, to the depth of two inches, and then the pots were furnished with sticks for the moth to run up, gauzed over, and the pots were sunk in a very gentle hot bed. They went into pupæ, and produced fine imagines about the middle of September. The younger larvæ fed up, buried, was treated in the same way, and produced a fine moth on November 6th.—(Mrs.) E. S. HUTCHINSON, Grantsfield.

SPHINX CONVULVULI AT COVENTRY.—I have failed in taking any *Convulvuli* this year, though the species has occurred here as elsewhere. The first specimen I heard of was taken on 5th September, on the window of the Reform Club, where it had doubtless been attracted by the light. This specimen was in fine condition, but was much rubbed by being handled by inexperienced hands. I heard of another taken by a gentleman outside the town, but I have not seen it.—FRANK BURROWS, Coventry.

XANTHIA AURAGO IN OCTOBER.—On October 22nd, I captured at rest on an oak an apparently fresh emerged specimen of *Z. aurago*. This specimen was procured in a small wood not a quarter of a mile away from the smokest and most sulphurized portion of our not alas! over clean town.—A. E. HALL, Norbury Pitsmoor, Sheffield.

C. XERAMPHELINA v. UNICOLOR.—Among the *Xerampelina* taken by Mr. Meldrum, of Ripon, this year, in an example of the variety *Unicolor*. The entire wings are as described, reddish-orange, the dark band is wanting, but two yellow lines show its place. It is rather a small specimen, and slightly damaged in the hindwings, but it is an interesting addition to my series, Mr. Meldrum having most kindly given it to me.—JOHN E. ROBSON, Hartlepool.

CALOCAMPA EXOLETA.—Is it generally known that the larva of this species will eat the blossoms and leaves of the Scarlet Geranium? Two noble larvæ were found this summer on plants growing close to this house. In confinement they preferred the blossoms to the leaves, but at both ate freely, and in due time produced fine imagines.—(Mrs.) E. S. HUTCHINSON, Grantsfield.

ENNOMOS FUSCANTARIA.—I had the pleasure of rearing this pretty insect this year. I found a larva crawling up the trunk of an ash tree in Newby Park, Ripon, after a gale of wind, from which on the 28th September, I bred a fine imago. This is the second time I have found the larva under similar circumstances.—THOMAS MELDRUM, Ripon.

EUPITHECIA SUCCENTURIATA.—To find this larva beat corner patches of the food-plant. Should this fail, gather all the dead leaves at the base of the stems, strip them off and examine them at night. If, however, you beat the plant from 10th to 20th September, you ought to find the larva. It is long and slender, and is very often ichneumoned.—C. S. GREGSON, Liverpool.

MELANIC VARIETY OF MELANIPPE MONTANATA.—Mr. Meldrum, of Ripon, has brought for my examination a melanic variety of the common Silver-ground Carpet, taken by Mr. Waite, in June, 1886, in a lane near that city. It is a very extreme form, the whole of the wings being dark, unicolorous, greyish-black. At first sight it appears to be devoid of markings, but on closer examination, the central band may be distinctly seen as a darker shade across the centre of the wing. Those who are familiar with melanic forms of *Arctia caja*, will know how the pattern of the forewings, and the spots on the hindwings, appear on the unicolorous surface. In the same manner the central band appears on this specimen, but perhaps scarcely so distinctly.—JOHN E. ROBSON, Hartlepool.

SEMARIA WÆBERANA.—I should hardly call this a southern insect. It occurs freely in my garden, and feeds in the trunks of old pear trees. I have no old apple trees, but plenty of old plums, none of the latter, however, are attacked by this species.—PHILIP B. MASON, Burton-on-Trent.

THE MONTH'S WORK OF A TYRO.—The ivy is but just opening its buds even in the South here, so that nothing has been done yet at ivy bloom. The weather has been cold and north or north-east winds have prevailed, and brought with them even thus early, snow, after an absence of only twenty weeks. Having no brother of the “net and pin” here I have confined my sugaring to a space, fifteen feet by ten, a cut through a plantation here. In this limited spot I have obtained during the past month: *Catocala nupta*, 3; *Epunda nigra*, 2; *Scopelosoma satelletia*, 2; *Hypena rostralis*, 3; *Polia flavocincta*, 2; *Cerastis vaccinii*, 2; whilst *Litura*, *Spadicea*, and *Oxyacantha* were always numerous. Among the *Oxyacantha* I took six specimens of the var. *Capucina*. I also took *Nonagria fulva*, though not on the sugar. “Lamping” gave me six *Ennomos tiliaria*; eight *Himera pennaria*; two *Nonagria lutosa*; two *Scotosia dubitata*; four *Diloba cæruleocephala*; one *Cratagi*; five *Hydræcia micacea*; six *Gortyna flavago*; one *Xanthia silago*, and one *Xylina petrificata*, whilst *Eubolia cervinata*, *Oporabia dilutata* and *Cidaria miata* were on almost every lamp. Larvæ have been rather disappointing, I have, however, obtained more or less of the following species, *Pygæra bucephala*, *Orygia pubibunda*, *Acronycta aceris*, *Mamestra persicaria*, *Sphinx ligustri*, and *Saturnia pavonia-minor*, and perhaps half-a-dozen other species which I do not know, including geometræ.—JOHN K. CLARKE, Woodlands, Hitchen, October, 1887.

ZYGÆNA MELILOTI.—“I see that Mr. Webb considers *Meliloti* to be a form of *Trifolii*. I cannot understand an insect starving itself in a state of nature, and thus producing a stunted race, though I confess I could never see any distinction between New Forest *Meliloti* and small specimens of *Trifolii*.”—J. E. ROBSON.

“Voluntary starvation to produce stunted specimens I no more believe likely to occur than Mr. Robson does. This can scarcely take place where the food is abundant, and cover, *i.e.* shelter accessible, but where the food is scanty and shade wanting, the sun has a deterring effect in the growth of the larvæ. Witness our Dover *Corydon*, which run very small where the cliffs have but little herbage, and we all know a hot summer produces small imagines of *Icarus*, second brood, though I have not seen the second brood of *Adonis* perceptibly smaller. Now it is well known that until the railway drained the neighbourhood where *Meliloti* occurred, the variety known by that name was not found in the Forest; the spot, too, as I remember it, was much exposed to the sun. Perhaps another change has taken place, as the insect cannot now, I hear, be obtained.”—SYDNEY WEBB.—*From the Note Book of the Exchange Club.*

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A BRIEF REVIEW OF THE LATE HAGGERSTON ENTOMOLOGICAL SOCIETY.

By ERNEST ANDERSON, LATE SECRETARY.

THE origin of this well-known society may be traced back to the year 1858, when it was suggested by Mr. Sayers, at a meeting held June 10th, 1858, seven gentlemen being present, that an entomological society be formed in Haggerston. The idea was eagerly taken up, and a week later the society was formally inaugurated, a chairman, secretary, and treasurer appointed, and about twenty members enrolled. At the next meeting rules were drawn up and ordered to be printed, and the subscriptions were at once applied to the purchase of the most useful entomological works. These meetings were held at the "Carpenters' Arms," a small public-house in Martha Street, Haggerston, and before three months had elapsed, the number of members increased to thirty. According to the rules at this period, the officers were changed every quarter, an arrangement which certainly gave variety to the proceedings at very brief intervals.

The young society, which in another three months had increased to thirty-five members, was early recognised and encouraged by the late Edward Newman, who at one time was a member. It was soon found that the first set of rules were very inadequate, and the place of meeting was small and inconvenient. Accordingly, in January, 1859, a committee of management was appointed, with instructions to devote their first energies to the revision of the rules, and at the same time a motion was made that the place of meeting be removed to some coffee house or hall. An amendment to this was, however, proposed and carried, that the meetings in future should take place at a private house, and this matter was then also placed in the hands of the committee. These gentlemen appear to have set to work with some energy,

and in March the revised rules were finally passed and printed ; they further decided to devote ten shillings quarterly towards the purchase of a cabinet, and further any balance which might be in hand at the quarterly audit, was also to be devoted to the same object.

The success, which had so far attended the society, prompted its members to start a Botanical Society in connection ; but this scheme, although officially decided upon, met with a speedy termination, at any rate very little mention is made of it in the minutes after the entry denoting its being called into existence. Some very rare species were shewn during the first year, amongst which were : *C. erythrocephala*, *N. bicolora*, a larva of *D. galii*, found feeding on fuschias in Victoria Park, a specimen of *A. sacraria* captured on a lamp at Clapham, and the then very rare *Smaragdaria*.

Meanwhile the Committee were unable to obtain a suitable meeting in a private house, although they advertised for that purpose, and in August they were obliged to inform the members of their failure. It was then decided to move to the "Brownlow Arms," and the first meeting in the new room took place on September 15th, 1859, and for 28 years the meetings continued to be held there.

The first original paper was read before the society by Mr. Miller, and was entitled "Foreigners and doubtful British species," it may be found in the "Zoologist," for January, 1860. In this year the society acquired a 40-drawer cabinet, and Mr. Hockett having planned it out with great care, donations quickly came in chiefly from members, and a notice in the "Intelligencer" brought in a few specimens. In this year also the first annual excursion took place, to the then famous locality of Darenth Wood.

The society continued to progress, continuing to change the officers every quarter until 1862, when it was proposed that they should be elected annually. This proposal gave rise to considerable opposition, and it was finally agreed that they should be elected every six months, an arrangement which has lasted till the present year. Many interesting items occur in the minutes about this time. The capture of a specimen of *O. lunaris*, at West Wickham, by Mr. Smith, gave rise to some little commotion, as did an unknown geometer, taken in the Kingsland Road, by Mr. Sayers, which being sent to Mr. Newman for identification, proved to be *B. fuliginaria*.

In 1863, Mr. Birchall forwarded for distribution 50 specimens of *Z. minos* and 60 of *N. zonaria*, both species being then of much greater rarity than at present. About this time the society acquired, at a cost of £2 5s., three specimens of *N. carmelita* and one of *A. alni*, which at the time was thought a very great bargain. Now also the question of the preservation of Epping Forest from the repeated enclosures being made, began to exercise the minds

of Londoners, and the members were most active in getting up a petition, and getting it presented in the House of Commons.

In 1864, money prizes were offered for the best collections made during the year, and the offer was repeated in 1865. About this time, however, the society began somewhat to decline, and at the end of the year we have a somewhat desponding report, and find that the number of members had decreased to 32, a decrease continued in the following year, in consequence of which the usual annual dinner was not held. However, by 1867 we find the society had acquired a library of 200 volumes, and the cabinet contained 2,000 specimens.

In 1868, Mr. Eedle went to Scotland collecting, partly for the Society, and made many valuable additions, and at the close of that year the first annual exhibition was held, proving a great success. Fortune then seemed to smite, and for over ten years the society was very active, the number of members reaching its highest point during 1874, in which year there were considerably over 100 names on the books. The question of Epping Forest was kept constantly in view, and during this period several more petitions on the subject were sent to the House of Commons; and also our address to the late Mr. Fawcett, thanking him for his opposition to the enclosures, and the final success in this matter was hailed with great satisfaction.

In 1879, a manuscript magazine was started, but the labour it entailed was so great that it had very soon to be abandoned. The society was instrumental in getting the Doubleday collection deposited and kept at Bethnal Green, where may also be seen several cases of life histories, the gift of the society to the museum.

The scheme of the Great Eastern Railway Co., in 1880, to make a cutting through one of the prettiest parts of the Forest, once more put the members on their mettle, they presented a petition signed by nearly 2,000 persons, against this new attempt to destroy what has ever been a favourite collecting ground, and the President had the pleasure of announcing shortly afterwards, that the Company, discouraged by the opposition had withdrawn their bill.

The recent history of the society has been somewhat chequered, but its transformation into the "City of London Entomological Society," has been so successful up to the present, that there is every prospect of the new society rivalling the most halycon days of the old. The present members have much to thank their predecessors for, inasmuch as they reap the benefit of the very fine library, &c. Nearly all the gentlemen in London who pursue this study have been at some time members, and young naturalists who wish for help from their brother workers cannot do better than to join the re-organised society, where they may be assured of receiving a hearty welcome.

OBNOXIOUS AND INJURIOUS INSECTS.

By JOSEPH CHAPPELL.

(Concluded from page 212.)

S. tipuliformis larva feeds in the branches of currant bushes. It is very common at Bowdon and Manchester district. It causes the tree to look unhealthy.

S. scoliæformis larva feeds in the trunks of birch, and is very destructive. It is, fortunately, rare in Britain; it occurs near Llangollen.

S. sphegiformis larva feeds in the stems and branches of young alder, and occasionally birch. The stems in which they feed vary in thickness from about one to two inches in diameter. It occurs sparingly on Chat Moss, and Burnt Wood, Staffordshire.

S. asiliformis is said to feed on the stems and roots of aspen and poplar.

S. bembeciformis larvæ feeds in the trunks of black poplar (*Populus nigra*), sallow, and willow. It is very destructive. I have seen a great number of trees that were destroyed by this insect near Manchester. I counted 60 pupa projecting out of one tree in a season; it betrays itself by frass.

S. apiformis larvæ feeds in the stems and roots of poplar, and in the root stocks of osiers.

Zenzera æsculi larvæ feeds in the wood of various trees as pear, apple, lilac, and elm. It is a very destructive species, and occurs at Burton-on-Trent, and in the South and West of England.

Cossus ligniperda larvæ live three years, and feed in oak, birch, alder, apple, pear, elm, and willow. This is a very destructive insect, boring in every direction, but most frequently upwards, by that means it keeps out the rain. I have seen many very large oaks and other trees destroyed by this insect, whose presence may be known by the peculiar smell, like goats, from whence the name of Goat moth. It may also be detected by the sap which flows down the cracks on the outside of the trees in which the larvæ are feeding. The exuding sap is very attractive at night to other insects, also to the female of the above species, which deposits her ova near it, consequently when a tree is infested the attack often proves fatal. Many coleoptera are found in the burrows feeding on the fœtid sap. This species is common in Dunham Park, and sparingly all round Manchester. An oak tree near Peover, Cheshire, is perforated so very much that it would be interesting to procure a section of it for some of our museums, if possible, to show the damage that can be done by this insect, even to British oak, which is thought by some people to be so hard that it cannot be penetrated by insects.

ZYGÆNA MELILOTI.

By C. S. GREGSON.

At page 224, of the "Young Naturalist," Mr. Webb considers *Z. meliloti* to be a form of *Z. trifolii*. That our young friends may not be misled by mere opinions, let us ask Mr. Webb to give us what knowledge he may have upon this question. In the meantime, let us look at the facts. First then, *Z. trifolii* is an exceedingly variable species, specimens occurring commonly in the same locality, in different seasons from 1 inch 4 lines, to 2 inches in expanse. From five distinct bright red spots upon its *opaque* upper wings, to three spots or blotches and to one long irregular mass of red, and sometimes to suffused red wings, having only dark margins into which the red blends; sometimes the red spots are large, sometimes they are scarcely perceptible. It also varies very much in its hind wings. Often the underwing is broadly bordered with a somewhat irregular bright bluish green, often the border is narrow. Of the difference in the shape of the antennæ, I think Mr. Doubleday wrote some years ago in the "Entomologist," so I leave that point; but will note the difference in the shape of the upper-wings. The costa of *trifolii* is straighter for a greater distance along the wing than in *meliloti*, then drops down short to the tip, making the wing more pointed than in *meliloti*.

Meliloti is a most invariable species, both in size and markings. Its range in size is from one inch one line down to eleven lines, average size one inch, and is invariably semi-transparent. Its central mark is placed at the fork of the sub-costal and median nerve and is mostly cuniform, the point of the arrowhead being between the spring of the nerves. Sometimes it is a slightly pointed oval, whilst in *trifolii* this mark goes to all sorts of shapes, except to these named; the costa of *meliloti* is straight for a less distance than in *trifolii*, and drops down further from the apex, thus giving the wing a rounder point than in *trifolii*. Its antennæ are shorter, and the thickened part narrower and less club-like, and the whole insect seems more fragile than small specimens of *trifolii*. It is like a race horse, to a carriage horse, *trifolii* is coarser bred. I thought this subject was settled years ago. Doubleday placed it at first as a reputed British species, not as a variety, but gave it as a variety of *trifolii* in his synonyms, but afterwards he admitted it as a species. In my Continental collection are seven specimens, two are one inch two lines, and the other five average one inch. Then they are about one line larger than the average in my series of about 30 English specimens, but the average size of *trifolii* from the Continent is much more.

I have gone more fully into this matter than perhaps is necessary, but questions like these are better gone into as they arise, and should Mr. Webb

have any proof, not opinion, to offer nobody will be better pleased to have it than myself.

NOTE ON LIPARIS DISPAR.

By A. E. HALL.

On seeing the remarks upon this subject at pages 192 and 213 of volume viii of the "The Young Naturalist," I thought a few further remarks respecting this question might prove interesting to some readers of this magazine.

In 1885, I procured a few ova of this species from my lamented friend and helper Mr. Henry Willits of this town. He seemed only loth to part with them as they were all he possessed, but thinking he might never be able to breed them, for he was very unwell at the time, he give them to me, at the same time asking me to keep the brood up as long as I could, for they were from a true British source. He told me that he had kept the brood up for upwards of ten years, and he believed that they were one of the few true English existing ones. He would not tell me the locality from whence he derived the original specimens, but he had no reason to deceive me, and those who knew him personally can vouch for his being exceptionally honest with regard to importing foreign stuff, which he never did. From these in 1886 I bred some 20 males (small and light coloured) and 15 females (markings very indistinct); of the latter one was perfect, four complete cripples, six with just the hind-wings crumpled up at the edges, and four with one wing slightly crippled. From five of these crippled specimens I obtained ova, and from these I have this year bred about a 100 perfect specimens, with only one cripple (male.) Some of the females were unusually large and well marked, but the greater part were almost white; about two-thirds of the of the males were large and dark specimens, and the remainder light coloured and rather smaller. The larvæ were fed on whitethorn, it will thus be seen that crippled specimens have produced a large number of perfect ones. I had a few larvæ from another source, but they all died, although treated in the same manner as the others.

I let several of the males and a few of the females at liberty, and I had the pleasure of seeing some of the former flying, two or three times in my father's grounds. When I observed them it was always about noon and in a shady avenue, they have a very peculiar zig-zagging flight, and I should think extremely hard to catch when on the wing.

I am going to try and naturalize this species in a few localities around here; I trust I may be successful, but I very much doubt it.

Norbury, Sheffield, November, 1887.

REPORTS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 2nd, 1887.—Dr. David Sharp, F.Z.S., President, in the chair.

Mr. Stevens exhibited a specimen of *Acidalia immorata*, L., purchased by him some years ago at the sale of the collection of the late Mr. Desvignes. Mr. Stevens remarked that specimens of the insect lately captured near Lewes had been described last month by Mr. J. H. A. Jenner as a species new to Britain.

Mr. Adkin exhibited, and made remarks on, a series of male and female specimens of *Arctia mendica* from Co. Cork; he also exhibited for comparison two specimens of *A. mendica* from Antrim, and a series of bred specimens from the London district. Some of the males from Cork were as white as the typical English females, but the majority of them were intermediate between the form last mentioned and the typical English form of the male.

Mr. Enoch exhibited a specimen of *Calocoris bipunctatus* containing an internal parasitic larva.

Dr. Sharp exhibited three species of Coleoptera new to the British list, viz.:—(1) *Octhebius auriculatus*, Rey, found by Messrs. Champion and Walker some years ago in the Isle of Sheppey, but described only quite recently by M. Ray from specimens found at Calais and Dieppe. (2) *Limnius rivularis*, Rosenb., found by the late Dr. J. A. Power at Woking; the species though not uncommon in Southern Europe, had not, he believed, been previously found farther north than Central France. (3) *Tropiphorus obtusus*, taken by himself on the banks of the Water of Cairn, Dumfriesshire; he had considered previously that this might be the male of *T. mercurialis*, but M. Fauvel, who was studying the European species of the genus, informed him that this was not the case. Dr. Sharp also exhibited a *Goliathus* recently described by Dr. O. Nickerl as a new species under the name of *G. atlas*, and remarked that the species existed in several collection, and had been supposed to be possibly a hybrid between *G. regius* and *G. cacicus*, as its characters appeared to be exactly intermediate. He also exhibited a living example of the Mole Cricket, *Gryllotalpa vulgaris*, from Southampton; between the spines of its hind legs were a number of living Acaridæ placed in a symmetrical manner so as to appear as if they formed a portion of the structure of the limb.

Mr. Eland Shaw exhibited two species of Orthoptera, which had been unusually abundant this year, viz. *Nemobius sylvestris*, from the New Forest, and *Tettix subulatus*, from Charmouth, Dorset.

Mr. E. B. Poulton exhibited the cocoons of three species of lepidoptera, in which the colour of the silk had been controlled by the use of appropriate

colours in the larval environment at the time of spinning up. Mr. Poulton said this colour susceptibility had been previously proved by him in 1886, in the case of *Saturnia carpini*, and the experiments on the subject had been described in the Proc. Royal Society, 1887. It appeared from these experiments that the cocoons were dark brown when the larvæ had been placed in a black bag; white when they had been freely exposed to light with white surfaces in the immediate neighbourhood. Mr. Poulton stated that two other species subjected to experiment during the past season afforded confirmatory results. Thus the mature larvæ of *Eriogaster lanestris* had been exposed to white surroundings by the Rev. W. J. H. Newman, and cream coloured cocoons were produced in all cases; whilst two or three hundred larvæ from the same company spun the ordinary dark brown cocoons among the leaves of the food-plant. In the latter case the green surroundings appeared to act as a stimulus to the production of a colour which corresponded with that which the leaves would subsequently assume. Mr. Poulton further stated that he had more recently exposed the larvæ of *Halias prasinana* to white surroundings, and had obtained a white and a very light yellow cocoon—far lighter than the lightest of those met with upon leaves. The larva which spun the white cocoon had previously begun to spin a brown one upon a leaf, but upon being removed to white surroundings it produced white silk.

Mr. Stainton suggested that larvæ should be placed in green boxes, with the view of ascertaining whether the cocoons would be green. He understood that it had been suggested that the cocoons formed amongst leaves became brown because the larvæ knew what colour the leaves would ultimately become. The discussion was continued by Mr. Waterhouse, Dr. Sharp, Mr. M'Lachlan, and others.

Mr. Klein read "Notes on *Ephestia Kuhniella*," and exhibited a number of living larvæ of the species, which he said had been recently doing great damage to flour in a warehouse in the East of London.

Mr. A. G. Baker contributed a paper "On the species of the Lepidopterous genus *Euchromia*; with descriptions of new species in the collection of the British Museum."

Lord Walsingham communicated a note substituting the generic name *Homonymus* for the generic name *Ankistrophorus*—which was preoccupied—used in his "Revision of the genera *Acrolophus* and *Anaphora*," recently published by the Society.

Mr. Waterhouse announced that at the December meeting he would exhibit a series of diagrams of wings of insects, and make some observations on the homologies of the veins.—H. Goss, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL
HISTORY SOCIETY.

November 3rd, 1887.—Mr. Cooke, President, in the chair. There was a very large attendance of members, and the exhibits were both numerous and good, amongst others might be mentioned a very fine series of *E. autumnaria* by Mr. Cooke; a long and variable series of *A. prunaria* by Mr. Anderson; a series of *A. pyramidea* by Mr. Pearson. Mr. Hanes exhibited *C. spartiata* and *X. rhyzolitha*. Mr. Fordham series of *G. rhamnii*, and Mr. Hockett a series of *E. autumnaria*. Mr. W. Dawes, of Mansfield, and Mr. H. Hillman, were elected members. The Secretary read a letter from Mr. H. T. Stainton, acceding to the Society's request, that he should become a member. A very interesting discussion then ensued on the common Cockroach and the means of destroying them, in which Messrs. Pearson, Anderson, Hockett, and Hillman took part. Mr. Hillman mentioned having seen wild ducks and gulls on the Thames at Chelsea during the previous week, driven up by the bad weather. Several other gentlemen having made remarks the meeting terminated.

November 17th.—Mr. Cooke, President, in the chair. The exhibitions were very numerous, the following being especially noticed. Mr. Hanes, series of *H. pennaria*; Mr. Goldthwaite, very fine series of bred *C. velusta*; Mr. Barker, long series of *H. abruptaria* shewing three broods in twelve months; Mr. Lusby, specimens of *P. dispar*; Mr. Harper, a nice selection of lepidoptera from Stornaway, including dark and light forms of *M. hastata*, vars. *B. repandata*, and *H. genistæ*. Mr. Hillman, bred series of *Audrena fulva* and cocoon, also a very interesting exhibit of a fungus on the Sycamore (*Rhytisma acerianus*), from Kew Gardens. The following gentlemen were elected members of the Society: Mr. C. A. Rance, of Forest Hill, Mr. T. W. Hall, of New Inn, Strand, Mr. Mera, of Forest Gate, Mr. Boultell, of Fulham, Mr. G. Hollis, Dartmouth, Park Hill, Mr. Howard Vaughan, of Kentish Town, and Mr. Rosenthal, of Tottenham. Mr. J. A. Clark brought before the notice of the members the account that had been lately been published of the whale washed ashore in the Thames, near Tilbury, and thought it very curious that it should have come so near to London. Mr. Hillman made a few remarks in reference to his exhibit, and stated that the growth of this Fungi is somewhat remarkable in that it appears generally after severe hot weather, and is seldom found in any quantity during ordinary seasons. It is very destructive, and in a few days after its appearance causes the fall of the leaf. The rest of the meeting was devoted to the nomination of officers, according to the new rules to serve during the next twelve months.—J. RUSSELL AND E. ANDERSON, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

October 27th, 1887.—R. Adkin, Esq., F.E.S., President, in the chair. Messrs. C. E. M. Ince and W. H. B. Fletcher, M.A., were elected members. Mr. C. A. Briggs exhibited dwarfed forms and varieties of *Lycæna corydon*, H., taken this year. Mr. C. E. M. Ince, a variety of the underside of *Argynnis paphia*, L., having a black blotch on the centre of the left superior wing. Mr. Sheldon, living larvæ of *Eupithecia expallidata*, Gn., and *Aphomia sociella*, L., and a discussion ensued as to the hibernation of this species in the larval stage. Mr. Tutt, a cocoon of *Saturnia pavonia*, L., having two exits, there being only one pupa inside; Mr. Tutt stated that Mr. Clark, of Hackney, had met with a similar pupa of *Bombyx trifolii*, Esp. Mr. Robinson, who was present as a visitor, *Tapinostola fulva*, Hb., *Plusia orichalcea*, and a specimen of Noctuæ, which Mr. Weir said was probably a variety of *Orthosia upsilon*, Bork. Mr. R. South stated that after a close examination of the specimen of *Zygæna lonicera*, Esp., with apparently four antennæ exhibited at the last meeting, he had found Mr. Tugwell's suggestion that the extra pair were simply the pupa cases of the antennæ, was correct, the only parts of the insect free of the pupa case being the legs and antennæ. Mr. R. Adkin read "Notes on collecting at Eastbourne during August and part of September." At the close of the paper a discussion took place, in which Messrs. J. J. Weir, Sheldon, Tutt, Cooper, Carrington, Tugwell, Wellman, and Billups took part.

November 10th, 1887.—The President, in the chair. Messrs. A. M. Keay, A.S.T.E., J. H. A. Jenner, F.E.S., and A. Robinson, were elected members. Mr. J. A. Cooper exhibited a curicus form of *Hadena dentina*, Esp., red forms of *Noctua glareosa*, Esp., and *N. castanea*, Esp., also a series of *Tephrosia biundularia*, Bork., from Derby. Mr. Oldham, a strongly marked variety of *Noctua baja*, Fb. Mr. Tugwell, English, Scotch, and Irish forms of *Boarmia repandata*, L. Mr. J. A. Clark, bred specimens of *Polyommatus phlæas*, L., with preserved larvæ and contributed notes. Mr. Goldthwaite, *Pericallia syringaria*, L., Mr. Mera, varieties of *Arctia caja*, L., bred from ova which hatched in June. Mr. Kenward, varieties of *A. caja*, one specimen having yellow hind-wings. Mr. H. H. Druce, a melanic variety of *Vanessa urtica*, L., taken at Mexico. Mr. Sheldon, a series of about 25 *Tephrosia biundularia*, Bork., from Derbyshire, and contributed notes. Mr. Tutt, specimens of *Dianthacia compta*, Fb., from Germany, and a variety of *D. conspersa*, closely approaching *D. compta*. Mr. West (Greenwich), *Dytiscus marginalis*, L., *D. circumflexus*, L., and *D. punctatatus*, L. Mr. Billups, *Astynomus ædilis*, L., from Chobham; *Strangalia aurulentia*, F., from

Warnham; and *Nebria complanata*, L. Mr. Tutt communicated a paper on "Darwin's Theory of Hybridism and Mongrelization."

The Annual Exhibition of this Society, was held at the "Bridge House" Hotel, on Wednesday, the 26th November, 1887, and notwithstanding the dense fog which prevailed, was very largely attended.

There were exhibits in all branches of Natural History, and during the evening the Sciopheon Company gave two displays of Photo-micrographs by the Sciopheon lantern. Among the principal entomological exhibits were those of Mr. R. McLachlan, of European Trichoptera, Ant Lions, Ascalaphus, Neuropteridæ, &c., and European Psocidæ. Mr. S. L. Mosley, cases showing the life history of the Hessian Fly *Cecidomyia destructor*, &c. Orthoptera by Mr. Eland Shaw and Dr. Sequeira. Exotic Coleoptera by Mr. E. Grut and Mr. Epps, the latter showing a box of West Indian and South American Weevils, which attack the Cocoa bean (*Theobroma cacao*.) British Coleoptera being represented by Mr. T. R. Billups' collection contained in 16 drawers, and by Mr. Cripps. Mr. Lewcock showing the Donacia and Longicornea; Messrs. C. H. Morris and J. H. A. Jenner also exhibited in this order. Diptera, Hemiptera, and Hymenoptera, were also shown by Messrs. Billups and Jenner. Mr. Bignell exhibiting an interesting case of Galls. In the Lepidoptera the exhibits were more numerous, exotic species being exhibited by Messrs. J. Jenner Weir, S. Edwards, E. Cooke, Frohawe, Dannatts Malyon, and The Zoological Society of London, the last named with specimens reared in the Insect House, in the Society's Gardens. Among the British Lepidoptera were those of Mr. Elisha, twenty drawers containing his collection of Tortrices, Tineæ, and Pterophori, a most interesting lot. Mr. Adkin, a long series of the white form of the male of *Spilosoma mendica*, also *Ephestia kuhniella*, with flour affected by the larvæ of this species. The Lycænæ were represented by the exhibits of Messrs. C. A. Briggs, A. B. Farn, T. W. Hall, E. Sabine, R. South, S. Webb, and others; Mr. A. H. Jones exhibiting two drawers of European species. The whole formed a most interesting show, and it is not often that such a collection of forms and varieties of this genus can be seen. Mr. Sabine's box attracted much attention. Mr. J. A. Clark, a most interesting case of *Zeuzera asculi* (*pyrina*), containing many good varieties, also two drawers of his collection. Mr. J. A. Cooper and Mr. S. Stevens shewed their collection of Rhopalocera, the latter containing a number of varieties and the specimen of *Melita eos*, Haworth, taken in 1802. Mr. Machin, a fine drawer of *Peronea hastiana* and *P. cristana*, principally the latter. Dr. Sequeira, insects taken in his garden at Hackney. Mr. C. H. Morris, *Acidalia immorata*, &c. Mr. Boden, a pocket box of Micro-lepidop-

tera containing many rare species and varieties, the most interesting being a variety of *Ennychia octomaculata* and a species which was not identified. Mr. South, comparative series of *Noctua brunnea* and *N. festiva*, including var. *conflua* from various localities, and a case of *Boarmia repandata* from many localities, including all the named varieties. Mr. Tutt, comparative series of Agrotidæ and European Zygænidæ. Mr. Howard Vaughan, two drawers of *Cidaria russata* and *C. immanata*. Mr. Eedle, life histories, the larvæ being mounted on the natural food-plants. Mr. Tugwell, his collection of Noctuæ. Mr. Wellman, three broods of *Acidalia rubricata*, many species of *Eupithecia* and *Pterophoridae*. Mr. C. H. Williams, a case of preserved larvæ. Mr. G. Baker, larvæ and imagines of *Eupithecia venosata*, *E. satyrata*, *E. Curzoni*, and *E. nanata*. Mr. R. S. Salvey and Mr. Blackall, many interesting series of Macro and Micro-lepidoptera. Among the other exhibitors in this order were Mrs. Hutchinson, Messrs. Barren, Croker, Dobson, Druce, Goldthwaite, Helps, Jenner, Joy, Lamplough, Levett, Rendall, P. Russ, Stringer, &c. Messrs. Neighbour and Son exhibited bee-keeping appliances, and there was a good display of microscopic objects, the Society being assisted by the Queckett, South London, and Hackney Microscopical Societies.—H. W. BARKER, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

The first *Conversazione* and exhibition of objects of entomological interest, was held by this Society on Monday, October 31st, in the Society's meeting room, in the Free Library, William Brown Street. The number of members and friends was very satisfactory, there being over 100 present.

After tea the President, Mr. S. J. Capper, F.L.S., delivered an address, explaining the aim and object of the Society, and the method of carrying on the ordinary meetings, and invited strangers present to become members, and take up a study which had been to him an endless source of pleasure for nearly 50 years. He alluded to the Library of the Society, remarking it was worth while for entomologists living at a distance to pay the small subscription, to have the advantage of borrowing the books alone. He advocated the placing of type collections of insects, such as his own educational collection, in all our schools, so that children might be taught to take an intelligent interest in our insect fauna, referring to his own school-days at Epping, where he gained his first knowledge of entomology and where the masters did their utmost to encourage the boys in the pursuit of natural history.

Mr. C. H. H. Walker delivered a lecture on "Ten minutes dabbling in a stagnant pool," giving an account of its insect inhabitants, their habits and

transformations. He received frequent applause for his clever chalk and crayon drawings.

Dr. J. W. Ellis, F.E.S., gave a sketch lecture on the "Mouths of Insects," and comparing the mouth parts of the bee, a beetle, and a butterfly, shewed that the same organs are present in each insect, although, of course, modified to meet their various uses.

On the tables were placed a number of interesting exhibits. By the President, Mr. S. J. Capper, 5 drawers, forming an educational collection of insects. In this were shewn the principal types, and in some cases the life-history of the whole order of insects; and a drawer of *Lycæna*, containing most extraordinary varieties of the undersides. By the Rev. H. H. Higgins, British *Syrphidæ*. By Mr. C. S. Gregson, 2 drawers of his wonderful varieties of *Abaxas grossulariata*, these drawers excited great attention, as they are recorded to be the finest lot of varieties of this species extant, being picked from over 100,000 specimens bred by himself. By Mr. F. N. Pierce, a drawer shewing the various modes of "setting," and a selection of British Lepidoptera shewing the larva and imago of each species, and a case shewing Irish cream-coloured *Arctia mendica*, compared with the ordinary form; also a series of several species shewing range of variation. By Dr. J. W. Ellis, British *Lamellicornes* and *Chrysomelidæ*, in the latter drawer was a full series of the beautiful *Chrysomela cerealis* taken by himself on Snowdon. By the Honorary Secretary, R. Wilding, drawers of British Coleoptera, this exhibit was greatly admired for the exceedingly neat way in which the beetles were arranged, and as containing many very rare species. By the courtesy of the Rev. H. H. Higgins and T. J. Moor, Esq., selections from the British and European collections of Lepidoptera, bequeathed to the city by the late Nicholas Cooke. By Mr. W. Johnson, a drawer from his cabinet containing the *Lithosias* and some grand varieties of *Arctia caja*; he also exhibited 2 boxes containing specimens of all the *Plusiæ* and *Dianthaciæ*. By Mr. R. W. Hughes, a drawer containing specimens of all species captured during the year, and with one exception around the Liverpool district. Mr. C. H. H. Walker had beautiful illustrations of insects taken from life, drawn by himself. By Mr. J. McIntosh, curious old entomological books; while round the room were distributed every conceivable apparatus useful in the collection and preservation of insects, exhibited by B. Cooke and Son, of this city. This exhibit commanded great attention, shewing as it did, the perfection that entomological apparatus had been brought to. It was curious to see old collectors handling zinc boxes, nets, &c., and seeing how money, now, could smooth the difficulties of their younger days. Microscopes were exhibited by Mr. J. C. Thompson, F.R.M.S., and other members.

CLYDESDALE NATURALISTS' SOCIETY.

The third monthly meeting of the session was held on Wednesday evening, 16th November, at 102, Bath Street. Mr. Robt. Mason, F.L.S., vice-president, in the chair. Mr. Angus Sinclair, 207, Parliamentary Road, and Mr. Millar Tompson, 1, Stanley Street, West, were elected ordinary members. Mr. J. A. Harvie-Brown, F.Z.S., F.R.S.E., sent for exhibition a series of albino specimens of the common guillemot (*Uria troile*), and of the puffin (*Fratercula urtica*), showing a remarkable variety of plumage, regarding which a short paper was read. Mr. George E. Paterson exhibited a fine specimen of an albino marvis (*Turdus musicus*), which was shot on Mr. Harvie-Brown's estate at Quarter, Stirlingshire, in July, 1871. Mr. Paterson also exhibited an egg and two nests of the shoveller duck (*Anas clypeata*), taken by him on the 7th of June this year, on a loch in the district. In making some remarks on the exhibit, he stated that at this locality two broods of this rare species have been safely reared, and he also noted that the pochard duck had also bred at the same place this season. Mr. James Lumsden, F.Z.S., exhibited a specimen of the shoveller duck (*Anas clypeata*), from Loch Lomond, which was shot on 23rd February 1887, by Mr. Robert How, gamekeeper to Sir George H. Leith Buchanan, Bart., of Ross. The specimen was a male, showing very clearly the change of plumage which takes place in this species between autumn and winter. Mr. Lumsden made some remarks on the great importance of giving in all notices of rare birds full particulars, and, if possible, the name of the person who had taken the specimen. He also exhibited the head of a rook (*Corvus frugilegas*), showing a curious malformation of the bill. Mr. John M. Campbell exhibited live specimens of the Massasanga or prairie rattlesnake (*C. tergeminus*), ribbon or swift garter snake (*T. saurita*), and of the American black snake or racer (*Coluber alleghaniensis*), measuring five feet in length, from the United States. Mr. Campbell read a short paper giving a brief account of the peculiarities and habits of each species. Mr. D. C. Glen, F.G.S., exhibited two large rattles which had been taken from a specimen of the deadly American rattlesnake. Mr. Robert J. Bennett read a most interesting paper, entitled "Apiarian Notes in Argyleshire for 1887," in which he gave a very minute account of his experiences in bee-keeping during the past year, and he also drew an instructive comparison between the progress made in apiarian matters in the United States, Canada, and this country, from which it seems that our British bee-keepers are quite able to hold their own. He expressed satisfaction at the decrease which had taken place in imports of honey during the past year. Mr. A. H. Shepherd, (corresponding member) contributed a paper on "New Forest Collecting, 1887," giving his entomological experiences at the famous locality during the

past season. Mr. John M. Campbell read a valuable and interesting paper as a "Contribution towards a fauna of Ailsa Craig." No one seems to have published a complete list of the fauna of the famous island, and Mr. Campbell, to supply the deficiency, has brought together a large number of records of species, and these, supplemented from his own experience, present a pretty fair list of the fauna of that island. He has not included the fishes and invertebrate fauna in his list, but believes that these will prove as interesting as the other groups which he has given.—JOHN MACKAY, *Hon. Sec.*

WARRINGTON FIELD CLUB.

A meeting of the above was held at the Museum, November 4th, 1887. Linnæus Greening, Esq., in the chair.

Exhibitions.—A large display was made, principally local captures of this year. The following were the chief contributors: Mr. B. Kendrick, specimens of coleoptera, neuroptera, and other orders from South Africa, North India, and China; Mr. C. R. Billups and Mr. J. F. Dutton, coleoptera of the district; Messrs. L. Greening, J. A. Jackson, J. Collins, T. Acton, and W. Mounfield, lepidoptera of the district.

Mr. Gregson, of Liverpool, brought two drawers from his cabinet with varieties and aberrations of *Abraxas grossulariata*, they contained over 500 specimens, no two alike, and in reply to enquirers Mr. Gregson observed that they were the results of 27 years continuous interbreeding, from over 4000 larvæ fed each year, except that in one year he had only 2000. Some of the best varieties bred were lost through the insects being allowed to pair, but the results of his continuous breeding were before the meeting. He said the most successful variety season was in 1886, when he set 76 good ones; he did not think 20 of the specimens bred in 1887 were worth setting, one fumose, one yellow, and one double black banded, being the most interesting forms.

The paper of the evening was read by Mr. B. Kendrick, on "The Hessian Fly (*Cecidomyia destructor*) and some of its congeners," and illustrated by well executed diagrams of the insects and their parasites; he also exhibited straws and heads of barley, grown at High Legh, near Warrington, by Mr. Rigby. Mr. Kendrick went searching for the Hessian Fly in consequence of seeing a report in the "Warrington Guardian" that it had appeared there, but found only the old and well known *Chlorops tænipus*, which feeds on the upper part of the grain stems and aborts the ears. It was observed by Mr. Gregson that the Hessian Fly scare was pretty well over now, and that from his own knowledge the insect was not a recent introduction to Britain, and so long as it had its own parasites to support, he felt little fear of material injury from it.

If it had to be fought, he felt sure such economic entomologists as understood its morphology, would give the farmers such information and instructions as would soon stamp it out of this country; observing it was only ignorance that caused such scares as this of the Hessian Fly and that of the Colorado Beetle.

An informal discussion afterwards arose on "Evolution *v.* Immutability of species," during which Mr. Gregson promised to read a paper on "Immutability of species" before the club, at an early date.

All the lepidopterous collections exhibited were labelled by Robson and Gardner's list, the variety names printed therein giving it a value for collections over every other list at present in use.—W. H. WOODCOCK, *Hon. Secretary.*

NOTES AND OBSERVATIONS.

LOST! A BUMBLE-BEE'S NEST.—My youngest brother and myself, while out on the moor in August of this year, were driven by a heavy rain-storm to take refuge in a little barn, which stood between the heather and the cultivated land. There being no windows to the barn we left the door standing open, and owing to this fortunate circumstance, we were witnesses of one of the most curious incidents it has ever been my lot to see.

We had not been in the barn more than two or three minutes, before we noticed that there were a number of humble bees flying restlessly about in the doorway, and every now and then settling under the door and crawling about on the ground. We, of course, at once concluded that there was a nest under the door, and we went up to see what it was that was disturbing the bees. examination proved that there was a nest, but that its entrance was not, as we had supposed, under the door as it then stood, but was situated between the stone which formed the doorstep and the first board of the wooden floor, at a spot which bore the same relative position to the door when shut, as that for which the bees were now making, did to the door when open. As soon as we noticed this fact we shut the door, and the bees—a moment before so puzzled—at once found their nest, others, too, coming up, dropped into the hole without hesitation. We then opened the door again, and once more the bees that came up were quite at fault, and further closings and openings of the door were followed by precisely similar results. The fact appeared to be that the bees while recognizing the door, and remembering under which part of it their nest was usually situated, were totally unable to take in the fact of the door itself having moved.—F. E. PRESCOTT DECIE, 4, Pump Court, Temple.



THE HISTORY OF OUR BRITISH BUTTERFLIES.

BY C. W. DALE,

GLANVILLES WOOTTON.

Family PAPHIONIDÆ.

Who loves not the gay Butterfly, which flits
Before him in the ardent noon, array'd
In crimson, azure, emerald, and gold ;
With more magnificence upon his wing—
The little wing—than ever grac'd the robe
Gorgeous of royalty ; is like the kine
That wander mid the flowers which gem the meadows,
Unconscious of their beauty.

CARRINGTON, *Dartmoor*.

GENUS I, PAPHIO.

Auctorum.

PAPHIO—The Latin word for Butterfly.

Linnæus first attempted to combine in some degree Natural and Civil History, by attaching the names of personages, illustrious in their day, to insects of particular kinds. His first division of the Butterflies consists of Equites (Knights), and these are sub-divided into Troes and Achivi (Trojans and Greeks). Our British species belong to the latter division.

Linnæus included the whole of the Butterflies under the generic name *Papilio*, but he only knew 260 species, whereas 7695 are included in Kirby's Catalogue of 1871. The name is now restricted to the Swallow-tails, which having a larger number of species than any other—over 500 species, although only four occur in Europe—and many of them being amongst the largest and most beautiful of the Butterflies, still give the name a deserved precedence.

The characters of the genus may be described thus : antennæ rather long, moderately thick ; fore-wings long, with arched costa ; hind-wings with the margin toothed, and a prolonged tail.

PAPILIO MACHAON.

The Swallow-tailed Butterfly.

MACHAON, Linn., Macha'on. The hero of this name is mentioned by Homer, Il. ii. 731—The two sons of Æsculapius, skilled in leechcraft, Podalirius and Machaon.

There is no possibility of mistaking this noble insect for any other of our native species, after a glance at its portrait. Its superior size, conjoined with the possession of a pair of long tails on the hind-wings, would at once mark it distinctly, independently of the peculiar markings and colour.

In the colouring of the wings, which expand from three to four inches, a broad simplicity prevails, the general ground tint being a clear creamy yellow, with the veins and marginal bands of the deepest velvety black. The broad bands of black on the front wings are powdered toward the centre with yellow scales, and those on the hind wings with blue scales. The only other colour on this side is a large eye-like spot of red, blue, and black, at the anal angle of the hind wings. The under side is very similar in colouring to the upper, but the black markings are less decided and sharp, and there are several red spots on the hind wings.

Very few varieties have been found in England. There is one in the British Museum, with the ground colour drab, instead of creamy yellow, and others similar are in a few private collections. There is also a variety with the veins of the hind wings obscured by the ground colour. The red of the eye spot, at the anal angle, sometimes shows more or less between the veins on the hind-margin. A variety named *Sphyrus*, which occurs in the South of Italy and in Algiers, has more black on the fore wings, and less blue on hind wings than the type.

The egg, which is laid in June or July, is globular, of good size, and with an apparently smooth surface. When first laid it is of a greenish yellow colour, quickly turning green, and soon after tinged with violet-brown, gradually deepening to purple, and faintly showing the embryo through the shell, which in a day or two turns entirely purplish-black, a process of change similar to that shown by a ripening black currant. The shell next assumes a light pearly transparency, and the dark embryonic caterpillar coiled round within is plainly visible, and in a few hours hatched (Buckler.)

The caterpillar, which is a very handsome creature, is found feeding on umbelliferous plants, among which, its chief favourites in this country appear to be the wild carrot (*Daucus carota*), the March milk parsley (*Peucedanum palustre*), and the wood angelica (*Angelica sylvestris*.) In colour it is bright green, with velvet black rings, which are spotted with yellow. When young it is much darker. A distinguishing mark of this caterpillar is a reddish

coloured forked appendage just behind its head, which, when the creature is alarmed, gives out a strongly scented fluid. Bonnet says: "When I pressed this caterpillar near its anterior part, it darted forth its horn as if it meant to prick me with it, directing it towards my finger, but it withdrew it as soon as I left off pressing it. This horn smelled strongly of fennel, and probably is employed by the insect, by means of its powerful scent, to drive away the flies and ichneumons that attack it. This remarkable V shaped scent organ is situated at the anterior margin at the back of the second segment. close to the head, from which, at first view, it seems to proceed. At the bottom it is simple, but divided towards the middle, like the letter Y, into two forks of a fleshy substance, which it can lengthen, as a snail does its horns, to five times their ordinary extent, or retract them within the stalk so as wholly to conceal them. Sometimes it protrudes one fork, keeping the other retracted; and often withdraws the whole apparatus for hours together under the skin, and its place is only marked by two tawny coloured dots, so that an ordinary spectator would not suspect the existence of such an instrument." Moses Harris describes the caterpillar as being marked with black transverse lines, in the same manner as the stripes of the zebra, on which lines and stripes are spots of fine crimson.

The chrysalis again is very pretty, especially when of its ordinary colour, which is a lively green, shaded in some parts into bright yellow, but there is a frequent variety marked only with various shades of brown and buff. In shape it is angular, with the head slightly bifid.

The first brood of the butterfly appears on the wing the middle of May, according to Lewin. The female lays her eggs in ten or twelve days after, and in a week's time the young caterpillars come forth. In six or seven days they cast their first skin; about the end of June they change their skin for the fifth and last time; and in six or seven days after this, they arrive at full growth. They then prepare for their approaching metamorphosis by fixing themselves with a strong belt of silk round the middle of their body, and by the tail. In a day's time the chrysalis is complete, and this superb butterfly comes forth in July following. The caterpillars from the eggs of this brood are bred about the first week in August. After the usual shifting of their skins they become full fed in the end of September, and change to a chrysalis in a short time. In this state they remain through the winter, and the butterflies are produced the following May.

The chrysalides are most interesting objects to keep during the winter months. As the spring advances, the colours of the butterfly begin to appear faintly through their green envelope, and the pattern of the upper wings, which only are visible, becomes at last distinctly perceptible, of course, in

miniature. This exit most frequently takes place in early morning, and his wings being tiny things, hang limply from his comparatively ponderous body. Their rapid growth is a matter of marvel, for in about an hour's time they reach their full expanse, and ere many hours are over, they carry him with most enviable celerity through the air.

Abroad *Machaon* has a wide range, being found in the North and West of Asia, and the Himalayan mountains; in North Africa; and in Western North America.

In Europe it is found everywhere, except in the extreme North of the Continent.

In England, it seems to have been formerly widely and plentifully distributed, but has never been recorded as an inhabitant of Ireland, Scotland, or the Isle of Man.

This butterfly was figured and described in the first entomological publication extant in Britain, an extensive one in folio, written in the Latin language, and published at London in the year of our Lord 1634, by Thomas Mouffet, entitled "*Insectorum sine minimorum Animalium Theatrum.*"

The next account of it we have is by John Ray, who, in his "*Historia Insectorum,*" published in 1710, mentions that he met with it in Sussex and Essex, and also that he found the caterpillar in Sussex on *Pimpinella saxifraga*.

In 1717, Petifer gives it as being caught about London and divers counties in England, yet rarely. He calls it the "Royal William," and adds "Its size, beauty, and tail differs it from all others."

Benjamin Wilkes writes, "The first brood appears in May, the second towards the end of July. Being in a meadow near Cookham, in Kent, on the 5th day of August, 1748, I observed a female Swallow-tail hovering over certain plants, which I found to be the meadow saxifrage, and examining them carefully, I discovered four eggs just laid by the fly, wherewith I was highly pleased. On the 13th of the same month these eggs produced caterpillars. On the 22nd of September, the caterpillars were full-grown, and fixed themselves in order to change into the chrysalis, which was produced on the 26th of September, in which state it still remains (January 20th, 1749.) I fed the caterpillar from its being first hatched, with the green leaves of the common carrot, which it eats plentifully. This fine butterfly may be taken in the meadows and clover fields, about Cookham, near Westram, in Kent, at the times above mentioned. It flies so swiftly that it is vain to follow it, you must, therefore, wait till it settles, and then if you be near, be nimble, and you may catch it without much difficulty."

In 1776, Moses Harris writes of it: "By some aurelians it is called the

“Royal William,” probably as a compliment to His Royal Highness, William Duke of Cumberland, who was popular for his defeat of the rebels in 1745, about the time when this insect appears to have been first particularly noticed. The caterpillar is large and beautiful, smooth and pale green on the back, being striped with black transverse lines, in the same manner as the stripes of the zebra, on which lines are spots of fine crimson. It feeds principally on wild fennel.”

In “White’s Natural History of Selborne” is a comparative view of the Calendar of Selborne, kept by the Rev. Gilbert White, at Selborne, in Hampshire, and William Marwick, Esq., at Catsfield, near Battle, in Sussex. In it we read: “Swallow-tailed butterfly appears August 2nd. White; April 20th, June 7th, last seen August 28th. Markwich.”

In the end of June, 1798, several larvæ were found by the Rev. Dr. Abbott, at Windlesham, near Bagshot, in Surrey; from these, in the following August, he reared some splendid Swallow-tails.

In his “Lepidoptera Britanica, published in 1803, Haworth writes, “I know that *Machaon* breeds near Beverly, in Yorkshire, yet, and my brother-in-law, R. Scales, of Walworth, near London, possesses a specimen of it which was taken there about seven years ago.

In the obituary list for 1815, might have been inserted the following: *Machaon*.—August 17th, at Glanvilles Wootton, from a nip of the fingers, Machaon, the last Duke of Cumberland, in Dorsetshire; having survived his distinguished predecessor William Duke of Cumberland, who defeated the rebels in 1745, seventy years; and his celebrated namesake—Machaon—the son of Æsculapius, the world-renowned physician of the Greek and Trojan war, about a thousand years. Between the years 1805 and 1815, several were taken in Dorsetshire: at Hinton Martel, by the Rev. W. Storey; at Charminster, by Mr. Garland; at Cranborne; at Winborne, near Blandford; and at Glanvilles Wootten. In August, 1808, my father took twelve specimens on three consecutive days. They used to frequent chalk-hills, and smelled very strongly of mint.

About the same time the Rev. C. Kingsley, L.L.D. met with it in great plenty in Cowslip Meadow, near Lymington, and it was also taken at Redlane, near Bristol, by the Rev. W. Ray, and in Glamorganshire. The Rev. Mr. Newman also met with it at West Camel, and the Rev. R. Burney at Rympton, in Somersetshire. Mr. W. Shrimshire took it in plenty at Wisbeach, in Cambridgeshire, and his brother Dr. F. Shrimshire, at Peterborough, in Northamptonshire, and it was also taken in great plenty by my father, at Whittlesea Mere, in the year 1814.

In his “Entomologist’s Compendium,” published in 1819, George Samo-

uelle writes : " It is very local, but occurs at Beverley in Yorkshire, and near Bristol, and has been taken in Hampshire, near the New Forest."

In her " Butterfly Collection's Vade Mecum," published in 1827, Miss Jermyn only gives the following localities for *Machaon*—Fenny Places, Acle, and Horning, Norfolk ; Cherry-Hinton, Madingley, Whittlesea, and Grandchester, Cambridgeshire."

In 1841, three specimens of *Machaon* were taken by three different collectors at Haverhill, Suffolk.

In 1856, George Austin writes in the " Entomologists' Weekly Intelligencer," I have been accustomed to find the larvæ of *Machaon* year after year in the osier beds, behind Beaufroy's Distillery in Battersea Fields, but never once detected it in the winged state."

In 1871, Newman in his " British Butterflies," writes, " I have repeatedly found the caterpillar feeding on rue in a garden, on Tottenham Green ; this was probably fifty years ago. It can now only be sought for, with any prospect of success, in the counties of Cambridgeshire, Huntingdonshire, Norfolk, and perhaps Suffolk. In the " Young Naturalist," for 1879, we read " In England, *Machaon* is a fen insect. It was formerly common in all the Norfolk and Cambridgeshire fens, and then occasionally visited gardens in the suburbs of London. Now it is almost, if not entirely, confined to Wicken Fen, in Cambridgeshire."

Departed friend, alas, good-bye,
Wilt thou Wicken too forsake ?
In Dorset, Somerset, Yorkshire, Kent,
We mourn thy loss—
Yea, regret it,

PAPILIO PODALIRIUS.

Scarce Swallow-tailed Butterfly.

PODALIRIUS, Linn. *Podalirius*, brother to *Machaon*.

The wings are pale yellow, with black transverse bands, the intermediate ones on the fore wings shorter ; hind wings with a black border marked with several blue crescents. They have also a long tail, and the eye-like spot at the anal angle of the hind wings is orange in front, and black, dusted with blue, behind. They expand from $2\frac{3}{4}$ to $3\frac{1}{2}$ inches.

The caterpillar is thick, shaped somewhat like a woodlouse, and contracted behind. It is green, with yellow lines on the back and sides, and with yellow transverse lines spotted with red. It feeds on almond, sloe, plum, apple, pear, and oak.

The chrysalis is shorter than that of *Machaon*, and stouter in proportion, more decidedly bifid at the head, and more pointed at the tail. In colour it is ochreous, with darker streaks.

It is a common butterfly in Southern and Central Europe, North Africa, and West Asia as Persia and the Altai; and is met with in open places near woods, especially in hilly districts, in May and July.

It appears to have formerly inhabited England, but is now extinct. ("Kirby's European Butterflies and Moths.")

Described by Mouffet in 1634.

In 1710, the "Historia Insectorum," by John Ray, was published in London by Dr. Derham, and in it he writes of *Podalirius*, "Prope Liburnum Portum in Etruria invenimus, atque, ni male memini, etiam in Anglia."

In 1795, Dr. Berkenhout writes, "Rare, in woods."

In 1803, Haworth in his "Lepidoptera Britannica" writes, "My friend, the Rev. Dr. Abbott, of Bedford, has informed me that he took in May last, near Clapham Park Wood, in Bedfordshire, a specimen of *Papilio Podalirius* in the winged state. An ingenious and practical friend, probably Mr Rippon of York, has informed me that he took two sorts of Swallow-tailed *Papilios* near Beverly, in Yorkshire, five-and-twenty years ago, but no specimens of them are now extant; a fire which, unhappily, destroyed great part of his property, having consumed them likewise.

In 1822, the Rev. F. W. Hope captured one in Shropshire.

In or about the year 1826, one was taken on the wing between Sough and Datchet, Berkshire, by Mr. Rudston Read, when a school-boy at Eton.

Family PIERIDÆ.

Celestial messengers are we.—
Of nature's soul the wild romances;
Like wavelet sparks on western sea,
When sunset's gorgeous train advances,
And o'er the surface, rippling dances.

WOLLASTON'S *Lyra Devoniensis*.

GENUS II. APORIA.

Hubner.

Apória, a figure in rhetoric, when the orator doubts what to do or say.—
Cic. Att. 7, 21.

The antennæ are rather long and thick; and the wings, especially in the female, are semi-transparent.

APORIA CRATÆGI.

Black-veined White.

CRATÆGI, Linn.; *Cratæ'gi*, from the generic name of one of its food-plants—*Cratægus oxyacantha* (Hawthorn.)

Of the White Butterflies found in England, next to *Daphidice*, this is the rarest. It is a delicate, and by no means inelegant insect, though altogether plain in its appearance; and may readily be distinguished from the other analogous species, by the extreme blackness of the veinings both of the upper and lower wings. From being very sparingly coated with scales, the wings are semi-transparent, differing much in this respect from the Large Cabbage White, which it equals in size, and might be mistaken for on the wing. It will be observed, that instead of the feathered fringe that surrounds the wings of most butterflies, they are bordered in this species by a stout nervure, forming a sharp outline, and giving a peculiarly chaste finish. The underside differs in no mentionable respect from the upper, which is a very rare circumstance amongst the butterflies. The female has a small smoke-coloured marking at the disc of the fore wings, which are generally of a browner tint than in the males.

The eggs are, according to Kollar, cylindrical, rather thinner at the ends than in the middle, longitudinally ribbed, and of a shining yellow colour. They lie exposed on the leaf, without being covered in any way, sometimes lying in rows one against another, sometimes in an upright position, to the number of one hundred and fifty. In a fortnight after being first laid, they change to a silvery colour, and look more deeply ribbed, and as if covered with beads at both ends.

The caterpillar feeds on the hawthorn, sloe, and various kinds of fruit trees. When young it is black, but becomes afterwards thickly covered with whitish hairs, and on the sides and underneath is of a dark grey colour, with two longitudinal stripes of red or yellow.

That accurate observer of Nature, accomplished scholar, and highly pleasing poet, the late Rev. Dr. Hurd, has thus minutely described the birth and habits of the caterpillar:—

“ Hatch'd by the sunbeam from continuous cells,
 Around the slender apple-twig combin'd
 In circuit orderly, egg glued to egg,
 Issue the caterpillar swarm minute.
 There left, oviparous, her half-born brood,
 Ere summer clos'd, the parent left and died.
 There have they still endur'd, and still surviv'd
 Sharp winter's tyranny; the bitter frost,
 That slew the myrtle, and the lasting leaf
 Of the screen'd laurel chang'd, no death to them:
 Now busily convened, upon the bud
 That crown their genial branch, they feast sublime,
 And spread their muslin canopy around,
 Pavillion'd richer than the proudest king.

According to Moses Harris, the female lays her eggs on the whitethorn, about the latter end of June, and the young caterpillars, as soon as hatched from the eggs, enclose themselves in a slight web, leaving a passage to come out to feed, which they generally do morning and evening, retiring within their web in the middle of the day, to avoid the heat of the sun; in this manner they feed the remaining part of the warm weather, extending their web as they increase in size. At the approach of winter, they spin a strong web on one of the twigs, wherein they remain without eating during the winter, and come forth again early in the spring, feeding very greedily on the buds and young tender leaves. In preparing for their transformation, they fasten their tail to a twig by a strong white web, after which they carry a strong thread over their back three or four times, near the head; this is likewise made fast to the twig on each side. In this position they retain the form of the caterpillar twenty-four hours, and the chrysalis appears, which is of a yellow colour, beautifully streaked and spotted with black. They remain in the chrysalis state twenty-one days.

This butterfly is unknown as an inhabitant of Ireland, Scotland, or the Isle of Man, and does not occur in the North of England. It is common over the whole of the Continent, and of Europe, penetrating even into the the extreme North, Lapland only excepted. It also occurs in Western Asia, and Siberia, where Pallas saw it flying in such abundance in the environs of Winofka, that he took it at first for flakes of snow.

This very local English butterfly is briefly described by Dr. Merrett, in his *Pinax*, 1667; by Ray, in 1710; and by Petiver, in 1717, who adds, "It is found in meadows about June."

It was beautifully figured by Elezar Albin, who in the year 1731, published at London, his "*Insectorium Angliæ Naturalis Historia Illustrata*," and described it as follows:—"The caterpillar *a* in this plate is black and orange colour on the back, the belly and holders of a pale green ash colour, with a small black spot on each joint; the head and fore-feet of a deep black. They are commonly found feeding on the Whitethorn at the latter end of April, on which I fed them till the 12th of May, at which time one of them tied itself up by the tail, and cross the middle, and changed into a chrysalis marked *b* in the copperplate, of a deep yellow marked with black, out of which, the first of June, came *Papilio albus venis nigris*, the White Butterfly with black veins."

Of this work, Mr. Haworth writes, in "*Transactions of the Entomological Society of London*," 1812. "We recollect it to be the most elegant one of its day, and to contain principally, but not exclusively, such lepidopterous insects as the author, or his friends, had reared from the caterpillar state:

exhibiting them picturesquely feeding on their proper plants, and in all their phases or mutations; the whole highly coloured, and accompanied by descriptions in the English language. Yet Albin's is a work but poor in science, even for its time; and his insects are sometimes depicted in tints more remarkable for gaudiness than fidelity; this, however, may probably be no more than merely the fashion or error of its era." Albin, however, greatly benefited science by figuring many ichneumons and flies he bred from several of the lepidoptera.

Lewin in his "Insects of Great Britain" published in 1795, writes, "It is not very common or easily taken on the wing, as it flies pretty quickly over meadows and corn-fields." Haworth in 1803, adds, "It is frequently found in gardens."

Curtis in his "British Entomology" writes, "Fortunately this butterfly is seldom very abundant in England, and from the care taken of our gardens, it seems to become annually more scarce."

J. F. Stephens, writes in 1828, "This elegant insect is somewhat periodical in its appearance, at least near London, In June, 1810, I saw it in plenty at Coombe Wood, and in the following year I captured several on Muswell Hill, since which I have not seen any at large. Mr. Haworth informs me that it used to occur constantly at Chelsea, but he has not seen any of late. In the New Forest, near Brokenhurst, and near Herne Bay, in Kent, it abounds, and, I believe regularly." Curtis adds, "It has been taken in Norfolk, Suffolk, and Monk's Wood, near Cambridge; and Mr. Dale has captured it at Enborne, in Berkshire, and at Glanvilles Wootton, in Dorsetshire." The last specimen at the latter place was taken on June 10th, 1815.

In 1858, *Cratagi* appeared in considerable numbers at Herne Bay, Kent, and other parts of the Isle of Thanet; also near Cardiff, in South Wales, where in the middle of April, the caterpillars were found feeding by thousands upon insulated shrubs of *Prunus spinosa* (Common Sloe); and several were taken in the New Forest.

In addition to the localities previously mentioned, *Cratagi* has been recorded as occurring at Moreton, in Devonshire, at the Holm Bush in Sussex, near Petersfield, and Waltham, in Hampshire, in the Isle of Wight, at Barnwell Wold, in Northamptonshire, at Malvern, in Worcester-shire, at Clevedon, in Somersetshire, and at Kimbolton, in Herefordshire.

In 1872, several were taken in the New Forest, in Kent, near Bristol, and in Herefordshire.

In 1882, a few specimens were taken near Festiniog, in North Wales.

It has now become a very rare butterfly, and has long been an extinct species in the counties of Devonshire, Dorsetshire, the Isle of Wight, Suffolk,

Norfolk, Berkshire, and Northamptonshire. Perhaps the cause of it may be explained thus:—Small birds, particularly the Titmice, devour the caterpillars soon after they are hatched, as well as in the following spring, when they are dispersed upon the shoots. So eager are the birds, that they break into their nests late in the autumn, to obtain them.—KOLLAR.

GENUS III. PIERIS.

Schrank.

PIERIS, one of the daughters of Piêrus, fabled to have been metamorphosed into magpies, for challenging the Muses to sing better than themselves.—Ovid.

Antennæ long and slender; wings white; fore-wings rather pointed and tipped with black, in the female always with a black spot near the anal angle; chrysalis angulated.

This is one of the largest genera of Butterflies, and its members are distributed over the whole world. As defined by Kirby, it numbers nearly 200 species, of which eight are recorded as occurring in Europe.

We have four British species, all of which, *Napi* perhaps excepted, appear to be colonists, as are probably also the two species of *Colias*. Two of them, *Brassicæ* and *Rapæ*, as likely as not, were introduced into England amongst the pot herbs of the Romans. The three species—*Brassicæ*, *Rapæ*, and *Napi*—are very prone to variation, and the late Mr. Stephens elevated the different broods to the rank of species. The summer broods are much darker in colour than the spring, and in very hot weather *Rapæ* gets a yellowish tinge; of late years it has acclimatized itself in Canada. *Rapæ* is the first butterfly in the year to emerge from the chrysalis state, doing so, but very rarely, as early as February; and the caterpillars have been found feed as late as Christmas. The two species, *Brassicæ* and *Rapæ*, are most frequently found in gardens; *Napi* more often in woods and lanes, and *Daplidice* on the sea coast.

PIERIS BRASSICÆ.

Large Cabbage White.

BRASSICÆ, Linn. Bras'sicæ, from the generic name of its principal food-plant, *Brassica oleracea* (cabbage.)

This is a very common butterfly in this country, occurring as far north as the island of Hoy, one of the Orkneys; and its caterpillar causes much damage in gardens, especially in and near towns, in dry seasons, which are favourable to their production.

It is very common throughout Europe, except the Polar regions, and also in North and East of Asia, and in Northern Africa.

There is a very brief description of it in Merrett's Pinax, published in 1667, but there is a very lengthy one in Martin Lister's edition of Goedart, published at London in 1685, giving a full account of its transformations.

The wings, which ordinarily expand from two and a half inches to two inches and three-quarters, are white, with a black crescent-shaped band at the tip of the fore-wings, and a black spot on the upper edge of the hind-wings. The female differs from the male in having a couple of black spots on each fore-wing, and also a black streak on the inner margin; the band across the tip is moreover much wider. The under surface of the hind-wings is greenish yellow.

Var. *b.* is distinguished from the typical variety, by the band on the tip of the wings not being jagged. It is generally rather smaller, but in other respects is not different.

Var. *c.* (*Chariclea*, Steph.) differs from the preceding, in the black band at the tip of the wings being paler. This variety is generally less than the typical ones. I have one which only measures one inch and three-quarters across the wings.

Var. *d.* is distinguished by having a black blotch at the base of all the wings. It was taken at Leicester, in 1843, and figured in the "Zoologist."

Var. *e.* Is distinguished by all the wings on both sides being of a dusky black colour. It is a female, and was taken near Perth, in 1868, and recorded in the "Entomologist."

The first brood comes forth from the chrysalis in the very last few days of April, or the beginning of May, and continues on the wing till June is nearly over. The second emerges towards the end of July, and lasts out till the middle of September.

The egg is a most graceful and interesting object. It reminds us of some antique vessel, ribbed and fluted with consummate elegance and regularity. The colour is dull yellow.

The caterpillar is bluish-green, with black dots and yellow streaks on the back and sides, and is slightly hairy. It feeds on cabbage and other species of *crucifera* in June, and also in September and October. "When about to change into the chrysalis state, it commonly fixed itself to the under-side of the coping of a wall, or some similar projection; but as the ends of the slender thread which serves for its girth will not adhere firmly to stone or brick, it covers the space of about an inch long, and half-an-inch wide, with a web of silk, to the base of which its girth can be securely fastened. This butterfly disposes its eggs side by side, so as to resemble a close column of

soldiers, in consequence of which, on hatching, those caterpillars which proceed from the upper end, cannot disturb the adjoining eggs. These caterpillars scale walls and even glass windows without difficulty; but in the last instance, if the square upon which the creature is travelling, be examined with a microscope, a visible tract like that of a snail may be seen. This consists of little silken threads, which it has spun in a zig-zag direction, forming a rope ladder, by which it can ascend a surface it could not otherwise adhere to. These threads being of a gummy nature, harden in the air, and easily attach themselves to the glass."—Miss Jermyn's "Vade Mecum."

The chrysalis is pale green, dotted with black. Bonnet states "that the chrysalids exposed to a frost of 14° R. below zero (C. "F.) became lumps of ice, and yet produced butterflies." There are two or three varieties of colour, of which the above is the commonest, Another variety is bluish green all over, with yellow ridges and spiracles, with the black spots much smaller and fewer in number. Another variety is mottled with the green and white tints.

This species is very subject to the attack of a Hymenopterous parasite—*Apanteles glomeratus*—concerning which is an interesting note in the "Magazine of Natural History," Vol. 3.:—"On the 28th of June, I put twenty caterpillars of the large cabbage white butterfly, into a wire cage, they were mostly full-sized, and continued to feed on cabbage leaves placed in the cage with them. On the following day, five or six of the largest left the leaves, and crawled about the sides of the cage during the rest of the day. The next morning, June 30th, I found them resting on large clusters of minute cocoons of an ovate form, the largest not exceeding two lines in length, and about the thickness of a caraway seed. Each one was enveloped with a fine yellow silk, resembling that of the common silkworm. On these clusters the caterpillars remained the whole day without moving. Fresh leaves were given to the rest, but in the course of this day they all left off feeding, crawled about the cage, but underwent no other change. The next day I found they had ejected the parasitical progeny they had been impregnated with, and like the preceeding, continued resting on the clusters they had formed, and the last operation of these devoted caterpillars was to envelope each cluster in a veil, formed of the most delicate web. Some of them executed the task, but the greater part were too feeble to complete it, and in the course of three days more, they became motionless, and gradually one after another fell to the bottom of the cage, exhausted and shrivelled. The clusters of cocoons varied in their number, some contained upwards of a hundred, others not more than sixty or seventy. On July 12th, the first-formed cluster of cocoons evinced a state of maturity, and in the course of the day, numbers of the perfect insect came forth. Their exclusion was

effected by forcing open a small circular lid at one end of the cocoon. The insects as they came forth, were active and ready for flight.”—F. H. 1829.

In Martin Lister’s edition of “Goedart,” 1685, is a very lengthy article on the present species. In it he says—“that he bred several ichneumons from the caterpillars, and also a species of two-winged carnivorous fly” and adds—“it seems contrary to the usual course of nature, that from one and the same animal an offspring of a different species should be generated, and that one and the same creature should procreate in three different way.”

The fly is *Exorista vulgaris*. Another parasite—*Apanteles rubripes* has also been bred from it. Two other insects of the same order—*Hemiteles fulvipes* and *Mesochorus aciculatus* are again parasitical on *Apanteles glomeratus*, thus illustrating the old rhyme—

“ Little fleas have lesser fleas
Upon their backs to bite ’em,
And these again have lesser fleas,
And so *ad infinitum*.”

This and the next species are the only British butterflies that can be charged with committing any appreciable amount of damage to human food and property. In the winged state indeed they are perfectly harmless, but not so the hungry caterpillars. Sometimes they are so abundant as to deserve the title of a plague of caterpillars. One of these plagues occurred in 1853 and 1854, at Rottingdean, in the County of Sussex, concerning which is an interesting note in the “Zoologist,” vol. 13, by the Rev. Arthur Hussey :—
“For the last two years many of the gardens in this village have been infested with caterpillars to such an extent that the cabbages have been utterly destroyed. When the time for changing to the chrysalis state arrived, the surrounding buildings presented a curious appearance, being marked with long lines of the creatures travelling up the walls in search of a suitable place of shelter for undergoing their transformation. Among the myriads which wandered in search of a resting place, very rarely one of them would stop upon a wall exposed to the south or south-westerly winds. A great number of them took refuge in a malt-house, from which they could not escape as butterflies, the result being that for several weeks the malster swept up daily many hundreds of the dead insects. Probably a very durable green die might be obtained from the bodies of these cabbage-fed caterpillars, as years of washing have not effaced the stain of one crushed upon linen.”

Besides the Ichneumons previously mentioned, birds do much towards diminishing the numbers of these devastating caterpillars, and in his “Lepidoptera Britannica” Mr. Haworth writes thus, “I once observed a large tit (*Parus majos*) take five or six large ones to its nest in a very few minutes. In enclosed gardens, seagulls with their wings cut are of infinite service. I

had one eight years, that lived entirely all the time upon the insects, slugs, and worms which he found in the garden."

In the "Young Naturalist" for 1880, is a notice by the Editor on a flight of *Pieris brassicæ* at Hartlepool. "It was a fine hot day in June, with scarcely any wind, when my attention was attracted by an unusual number of them flying past. The butterflies rapidly increased in numbers, many hundreds, nay, thousands were in sight. They kept passing in such enormous numbers that Mr. Darwin's expression "snowing butterflies" is the most appropriate that can be used. From the direction of their flight, it was evident they came from the sea, and a fisherman told me, that he noticed them some miles off the land in immense swarms, some alighting on the boat, others appearing for a moment to settle on the surface of the ocean, and then rise from it again, the sea at the time being perfectly smooth. They seemed, he said, either to come from the open sea, or from the extreme end of the high Yorkshire land, that bounds our view on the opposite side of the Bay."

PIERIS RAPÆ.

Small Cabbage White.

RAPÆ, Linn. Ra'pæ, from the name of one of its food-plants—*Brassica rapæ* (Rape).

This is a more abundant butterfly than the last, especially in the West of England, and occurs probably all over the British Isles, although it has never been recorded from the Shetlands, but I have taken it myself in the Isle of Skye.

It occurs all over Europe except in the Polar regions, in North Africa, Northern and Western Asia, and Japan.

In North America it has only been lately introduced, but is spreading rapidly throughout Canada and the United States. The first specimen appears to have been taken at Quebec in 1858. What is more remarkable is, that a yellow variety (*Novangliæ*, Scudd) scarcely known in Europe, has appeared in America, and it will be interesting to see whether it will eventually become the dominant American form of the insect.

In the "Lepidoptera of Scotland" by Dr. Buchanan White, we read, "There seems some reason to doubt whether this species and *Brassicæ* are not introductions in the North, since they are probably never found at any distance from cultivation, nor the larvæ upon any but cultivated plants."

There is a very brief description of it in Merrett's Pinax, 1667; but a longer one in Lister's edition of Goedart, 1685.

The wings, which ordinarily expand from one inch and a half to two inches and a quarter, are white, with a black or triangular blotch at the tip of the fore-wings, and a black spot on the upper edge of the hind-wings. The male has one, the female two black spots on each fore-wing. The blotch at the tip is larger in the female than in the male. The under surface of the hind-wings is yellow.

Var. *b.* is distinguished from the typical variety by the upper surface of the wings being of a cream colour. There is no difference in the black markings. It appears in very hot weather, or early in the spring when bred under glass.

Var. *c.* differs from the preceding in the black blotch at the tip of the wings being paler, and the spots on the fore-wings being very indistinct.

Var. *d.* (*Metra*, Steph.) differs from the last variety by the spots on the fore-wings being entirely obsolete, and the tips are merely shaded by a few dark points. It generally appears in April.

Var. *e.* has all the wings above immaculate white, with the base black, and the apex of the hind-wings very obscurely clouded.

Var. *f.* is distinguished by having a deep black patch at the base of all the wings. In other respects, like the type. It was bred by myself in 1869.

Var. *g.* (*Novangliæ*, Scudd) is canary yellow. It is extremely rare in this country, but not so in America.

There are apparently three broods in the course of the year, the first appearing in April or even earlier, and stragglers of the last may be observed till past the middle of October; sometimes their third brood does not appear when a late or dull season has retarded the development.

The egg somewhat similar to that of the preceding species, is in shape like a flask, with longitudinal ribs, coming up neatly and evenly to the apex, and has delicate reticulation. It is at first of a pale greenish yellow, and afterwards becomes more yellow.

The caterpillar, very different to that of the preceding species, is of a dull-green colour, with a yellow dorsal stripe, and yellow dots on the sides. It differs also from *Brassicæ*, which only feeds on the outer leaves, by eating into the very heart of the cabbage, and is often cooked. The caterpillar has been observed late in December.

The chrysalis is either dusky-drab, rosy pink, or dull-green, and has three narrow greenish-yellow longitudinal stripes.

Rapæ in a similar manner to *Brassicæ*, is very subject to the attack of parasites, and the following have been bred from it—*Apanteles glomeratus* and *rubecula*, *Hemeteles fulvipes*, *Mesochorus aciculatus*, *Pteromalus puparum*, and *Exorista vulgaris*,

Both the Cabbage Whites, *Brassicæ* and *Rapæ* have strong migratory propensities, and are most abundant in some years, and very scarce in others, In 1868 particularly, they were very scarce all over Britian, although it was a fine hot summer.

In 1818, these species abounded so greatly near the Metropolis, as to attract the notice of the public journalists, and Mr. Stephens had a brood of *Brassicæ*, which were scarcely seven complete days in the chrysalis state, the thermometer during the period varying from 70° to 80°.

In 1842, a vast flight of white butterflies came over from the Continent to the Kentish coast; and Mr. Thorncroft published in the "Entomologist," the following interesting observations on the subject. "It was a still hot day, with hardly a breath of air, and now and then the common *Brassicæ* and *Rapæ* would lazily fly in. The flood tide set in about 3 p.m. with a gentle breeze, and then came a host of the above named butterflies with a few of *Napi*. What surprised my friends and myself was their alighting or settling on the sea with expanded wings, and the ease with which they rose again. The shore was covered with a coarse sort of rye-grass, on which they were resting when we returned home, and in walking through the tall grass, they rose in myriads." "On Sunday, the 5th of July, 1846, one of the largest flights of butterflies ever seen in this country crossed the Channel from France to England. Such was the density and extent of the cloud formed by the living mass, that it completely obscured the sun from the people on board of the Continental steamboats, and the decks were strewed with the insects in all directions. The flight reached Dover about 12 o'clock, and dispersed themselves along the shore and inland, darkening the air as they went. During the sea passage of the butterflies, the weather was calm and sunny with scarcely a puff of wind stirring; but an hour or so it came on to blow great guns from the South-West, the direction from which they came." —Extracted from the "Canterbury Journal."

Rapæ is a very thirsty butterfly, and fond of alighting on the wet mud at the edges of ponds. In London, it may be observed following the water-carts, and pitching on the recently sprinkled roads. More than once, in going by the steamer from Weymouth to Lulworth, in hot and calm summer weather, I have noticed a swarm of *Pieris rapæ*, two hundred or more in numbers, leave the land and fly out to sea. Sometimes the swarm would remain apparently stationary for a while, and the individuals would disport themselves somewhat after the manner of mayflies, evidently enjoying the vapour arising from the briny ocean.

PIERIS NAPI.

Green-veined White.

NAPI, Linn. Na'pi, from the name of one of its food-plants—*Brassicæ napus*.

This also is a common butterfly, but it prefers woods and hedge-rows to gardens, and is less often seen in towns than *brassicæ* and *rapæ*. It is generally distributed over the British Isles, but is not known to occur North of Rosshire.

This is a very common species throughout Europe, and also in the North and West of Asia, and Japan. Far north and also on the Alps, a suffused variety of the female (*Bryonia*, Hub.) is met with.

It is very briefly described by Dr. Merrett, in his "Pinax," 1667, and by Ray, in 1710.

Napi is easily distinguished from *rapæ* by the distinct greenish veinings, branching over the disk of the under surface of the wings. On the upper side, the fore-wings have dusky tips, and in the male there is a round black spot in the middle, not very remote from the upper margin; the female has two such spots on the upper wings. The hind wings have a black spot on the costa.

The expanse of the wings varies from one inch and four lines to two inches and two lines.

Var. *b.* differs from the preceding in being spotless.

Var. *c.* (*Sabellica*, Steph.) allied to the typical variety, but dissimilar in form, the wings being shorter and more rounded. The under side of the wings are adorned with very broad dusky veinings. I have one almost as dark as *Bryonia*.

Var. *d.* (*Napææ* Esp.) differs from the preceding by its larger size, by having much larger sized spots, and also by having a much larger blotch at the tip of the fore-wings. The hind-wings are rather pale, with the three veinings above, green and dilated. The under surface of the hind-wings have a yellowish tint, and the veinings are rather indistinct.

There are at least two broods in the year, the first appearing about the middle of April or May, and the second in the end of July, and continues on the wing to the beginning of October.

The egg is laid singly, on end, and is flask-shaped, with 14 longitudinal ribs, not meeting very neatly, and with regular delicate transverse reticulation. The colour is at first pale green, afterwards becoming more pale and silvery; thus, although much like the egg of *rapæ*, it is longer, not so neat

at the apex, and always greener in colour.—From Appendix to “Buckler’s Larvæ.”

The caterpillar is much like that of *rapæ*, but can be known from it by its lighter green, by the absence of a yellow dorsal line, by the single yellow spot in each segment enclosing the spiracle, and by the absence of black dots below the spiracular line. It feeds on various species of the cress kind, in June and in September.

The chrysalis is either of a very pale pink buff, or of a light green colour.

PIERIS DAPLIDICE.

Bath White.

DAPLIDICE, Linn. Daplidice, one of the twenty-nine daughters of Danaus, King of Argos, who killed their husbands in obedience to their father’s orders.

This, one of the rarest of our British butterflies, varies in the expansion of its wings from an inch and a half to a couple of inches. The wings are white, with a shade of cream colour. The fore-wings, which are unusually pointed, have a large black spot (very large in the female), a little above the centre; and a black band at the tip, in which are situated some white spots. The underside of the hind-wings are irregularly mottled with green and white.

The female differs from the male in having a black spot near the inner margin of the fore-wings, and also by the hind-wings having some blackish markings.

The egg is of a bright pinkish red, and in shape very much like a cupless acorn.

The caterpillar is dull blue, striped with yellow and dotted with black, and has a green head. It feeds on mignonette and weld in June, and also in September.

The chrysalis is dark grey, with numerous black dots.

The late Mr. Buckler, proved by experimenting on the caterpillar, that it is a species quite unsuited to our climate, and belongs to a warmer country.

The Chequered or Bath White is common over Central and Southern Europe, especially along the shores of the Mediterranean, as well as on the opposite coasts of Asia and Africa. It is mostly found in dry and sandy situations, and I have seen it flying plentifully, in company with other Whites, over the slopes of the Metropolis at Athens.

The first person to record it as a British species was Petiver, who in his

"Gazophylaci Naturæ et Artis," published at London, in the year of our Lord, 1702, wrote thus "Vernon's Half Mourner. *Papilio Leucomelanus Cantabrigiensis nobis*. I do not know of any that has met with this in England, but Mr. Vernon about Cambridge, and there very rare." He adds in his "Papilionum Britannicæ Icones," published in 1717, "This has also been found about Hampstead in July or August."

In Ray's "Historia Insectorum," published in 1719, we read "A. D. Vernon habui, qui in agro Cantabrigiense eam invenit. Eandem D. Jezreel Jones circa Lisbonam, observavit, referente D. Petiver." He calls it "The Greenish Marbled Half Mourner."

In his "Insects of Great Britain," published in 1795, Lewin informs us that "It was named the Bath White, from a piece of needle work executed at Bath by a young lady, from a specimen of this insect, said to have been taken near that place. On my examining the insects purchased by J. T. Swainson, Esq., at the sale of the late Duchess Dowager of Portland's subjects in Natural History, I found this insect mixed with the female Orange-Tip; and it then appeared to me that some person collected this box of butterflies, and sent them to the Duchess, and from the great resemblance of this to the female Orange Tip, the difference of this rare species passed without being noticed."

Donovan in his "Natural History of British Insects" published in 1796, observes "That it is only found in the environs of Bath."

In the Preface to Haworth's "Lepidoptera Britannica," written in July, 1803, we read thus "Since the body of this work was printed, my friend, the Rev. Dr. Abbott, of Bedford, has informed me that he took in May last, near Clapham Park wood, in Bedfordshire, a specimen of *Papilio podalirius* in the winged state; and that he also took in June last, in White wood, near Gamlingay in Cambridgeshire, the *Papilio daplidice* in a faded state, and likewise *Papilio lathonia*. These are three extremely interesting species, and there is not a British specimen of any of them extant, except the above."

Dr. Abbott died in 1817, and his insects were purchased after his death by Mr. Dale.

The next specimen, a female, was taken by J. F. Stephens, Esq. on the 14th day of August, 1818, in the meadow behind Dover Castle. Another was taken that same year, by Mr. Miller, at Keynstone, between Bath and Bristol.

None appear to have been taken again till August, 1826, when it was met with by Mr. Leplastrier, at Dover, and by him again in August, 1835, and 1842: the latter specimen fortunately laid some eggs, from which Mr. Leplastrier reared four fine females and one male the following May.

In 1836, a specimen was captured by Mr. R. Dawson, in Roseberry Wood, near Exeter.

In 1852, one was taken near Whittlesea Mere, by Mr. Buxton.

In 1857, one was taken near Colchester.

In 1859, captures at Dover, Kingsdown, Brighton, and Tenterden, in Kent, were made and recorded.

In 1868, specimens were taken at Margate and Dover.

In 1870, two specimens were captured at Portsmouth, and one at Brighton.

In 1871, specimens were taken at Folkestone, Sandgate, St. Margaret's Bay, and Brighton.

In 1872, there were no less than four of *Daplidice*, nine of *Lathonia*, and two of *Antiopa*, taken at Dover by different persons, all three species being unusually common that year. Specimens of *Daplidice* were captured besides at Christchurch, Portsmouth, Brighton, Folkestone, Eastbourne, Deal, and Margate, Felixstow, and Newmarket.

In 1876, one specimen was taken at Southend, and another at Folkestone.

In 1884, a pair were taken at Dover.

In 1885, a couple were taken at Folkestone.

GENUS IV. ANTHOCHARIS.

Boisduval.

ANTHOCHARIS. Anthos, a flower; Chaireis, to delight in.

This genus is found throughout Europe, Asia, North Africa, and the western part of North America. The males may be readily distinguished from all butterflies by the orange tips of the fore-wings. The antennæ are slender and rather short, and the abdomen is slender. Another distinguishing mark of this genus is the chrysalis, which is very peculiar, and looks like a boat in miniature.

ANTHOCHARIS CARDAMINES.

Orange-tip.

CARDAMINES, Linn. Cardaminés from the generic name of one of its food-plants. *Cardamines impatiens* (Cuckoo flower.)

This truly exquisite and lovely little creature makes its appearance in April, and continues to flit gaily along by hedgerow and woodside to the beginning of July, charming vernal rambles in the country, whether entomological or no, by its merry blossom-like appearance.

The male is well known and common, but the female is scarce, and much resembles *Pieris daphnidice*, from which, however, it may be distinguished by the more rounded tips of the fore-wings, by its shorter antennæ, and by having a smaller lunule spot at the centre of the fore-wings. The ground colour is white. The underside of the hind-wings is chequered with green and white.

The expanse of the wings varies from one and a quarter to a couple of inches.

Var. *b.* Both sexes with a black spot on the upper surface of the hind-wings.

Var. *c.* Both sexes with the black spot on the fore-wings nearly obliterated.

Var. *d.* Female with a V shaped greenish-yellow spot on the under surface of the fore-wings, placed between the lunule spot and the inner margin.

Var. *e.* Male with a large and oblong lunule spot.

Var. *f.* Differs from the type, by the patch on the fore-wings of the male being yellow instead of orange.

Var. *g.* Male with a hardly discernible orange patch. This variety, which was in Mr. Haworth's collection, is probably an hermaphrodite.

The egg, which is laid in May or June, is of a yellowish-white colour.

The caterpillar is green, slender, with a white lateral stripe, and covered with raised dots bearing fine pubescence. It feeds on *Cardamine impatiens* and other Cruciferæ, in July and August.

The chrysalis is green, with a pink anal tip, and in shape greatly resembles a canoe.

It has a wide distribution in Europe, and is found also in the North and West of Asia.

In Britain, Forres appears to be its northernmost limit.

Mouffet figured and described it in 1635.

GENUS V. LEUCOPHASIA.

Stephens.

LEUCOPHASIA. Leukos, white; phasis, appearance.

The fore-wings are long and narrow without any discoidal spot, the antennæ are slender and rather short, the abdomen is rather long and very slender.

As yet only two species are known, and both are European.

LEUCOPHASIA SINAPIS.

Wood White.

SINAPIS, Linn. Sina'pis, named after the Mustard (*Sinapis nigra*), formerly supposed to be its food-plant.

The wings, which vary from one inch five lines, to one inch and seven lines in expanse, are white, with an ash-coloured blotch at the tip of the fore-wings, this blotch is of a much fainter shade in the female than in the male. The underside of the hind-wings has some obscure dull-green markings.

Var. *b.* Has the blotch of a deep black colour.

Var. *c.* (Summer brood) differs from the type in being of a more creamy white.

Var. *d.* (*Diniensis*, Boisd.) differs from the type in wanting the green markings on the under surface of the hind-wings; and the blotch at the tip of the fore-wings is smaller. and sometimes surrounded with white.

Var. *e.* (*Erysimi*, Bork.) of the female has the wings of an immaculate white without the blotch.

This variety has occurred in the New Forest.

The egg is of a glistening yellowish-white colour, and resembles a cucumber in shape.

The caterpillar, which feeds on the vetch (*Vicia cracca*) and other Leguminosæ in June and July, and also in September, is of a lovely delicate green, with a darker green dorsal line, and a distinct yellow spiracular line.

The chrysalis is very beautiful. In shape it is slender, very acutely pointed at the head, but not so much so at the tail. It has a yellow streak on both sides and white spots, otherwise it is green.

This is the most delicate butterfly we have, and the slenderness of its abdomen reminds one of the exotic genus *Leptalis*. It has a wide range on the Continent of Europe, being only wanting in the Polar regions. It also occurs in the North-west of Asia. The first brood is on the wing in May and the beginning of June, and the second in the end of July and in August. On a wet day it may be found settled on the underside of a leaf, in a shady lane, with its long wings pointed towards the ground.

Although found in most of the English and Welsh counties, and abundantly at Galway and Killarney in Ireland; it is a local species, frequenting the shady pathways and outskirts of woods, and flitting along with an undulating motion. Its extreme whiteness, combined with slow flight is as much an emblem of purity and innocence, as an ordinary butterfly is of the human soul. In 1865 and 1866 it occurred rather commonly in Dorsetshire and Devonshire, but in some years it is very scarce.

It is described in Ray's "Historia Insectorum," 1710; and Petiver, in 1717, wrote "I have observed this in Hampstead and other woods in June.

GENUS VI. GONEPTEREX.

Leach.

GONEPTEREX. Gonos, angular; Pteris, a wing.

This is also a small genus, possessing a little over a dozen species, only two of which, *Rhamni* and *Cleopatra*, occur in Europe. A distinguishing feature is that the body, which is rather stout, is covered with long silky down. All the wings possess an angular projection. The antennæ are short, rather thick, and of a red colour, hence Boisduval named the genus *Rhodocera*.

GONEPTEREX RHAMNI.

Brimstone Butterfly.

RHAMNI, Linn. Rham'ni, from Rhamnus the generic name of its food-plants, the Buckthorns.

The general colour of the male is a clear brilliant yellow, much like that of the Daffodil, its contemporary; and in the centre of each wing is a small spot of rich orange. As the male, from his colour, bears the name of "Brimstone" or "Sulphur," so the colour of his consort may be accurately compared to the tint of another chemical preparation, called "Milk of Sulphur." On the wing she is often mistaken for the Large Cabbage White. The expanse of the wings varies from two inches four lines to two inches and six lines.

Var. *b.* Male with the wings clouded, and minutely dotted and streaked with orange.

Var. *c.* Male with an orange patch on the fore-wings, somewhat resembling *Cleopatra*.

The egg is laid singly, generally on a rib of the under side of a buckthorn leaf in April or May. At first it is of a silvery-green, but afterwards turns to a yellow. In shape it is cylindrical, and resembles a flask.

The caterpillar, which feeds on buckthorn and blackthorn, and also, according to Lewin, on the wild rose, in June and the fore part of July, is of a dull green colour, and has a white lateral streak. It is subject to the attack of an hymenopterous parasite—*Limneria vulgaris*, which, according to Mr. Bignell, forms its cocoon inside of the caterpillar, and so constructs it, that the skin of the caterpillar is made to do duty for an extra protection.

The chrysalis is green, with several red dots; it is very gibbous in the middle, and attenuated like a boat in front; it is attached to the tail on a perpendicular branch, and fastened with a loose silken thread round the middle of the body.

The duration of the three stages of egg, caterpillar, and chrysalis must be limited to something less than two months; as the remainder of the year is passed in the perfect state.

The butterfly emerges from the chrysalis state at the end of July or in August, continues on the wing till the cold weather sets in, and then retires to its winter quarters. It does not, however, remain in them very long, and may often be seen sporting about in some flowery nook in the first sunny days of February and March, looking more like the petals of the primrose over which it hovers, floating on the breeze, than a living creature—

“As if Flora's breath, by some transforming power,
Had changed a flower into a butterfly.”

Sometimes this tenant of the garden and the flower bed, may be seen, like infancy by the side of age, sporting on the front of some old grey rock, or settling on the wild thyme,—or on the golden furze,—as its wings vibrate with a quickness that will dazzle the sight.

“Behold again with saffron wing superb
The giddy Butterfly. Released at length
From his warm winter cell, he mounts on high,
No longer reptile, but endowed with plumes,
And through the blue air wanders; pert alights,
And seems to sleep, but from the treacherous hand
Snatches his beauties suddenly away,
And zigzag dances o'er the flowery dell.”

Favourite Village.

Mouffet was the first English author to figure and describe it, which he did in 1633.

Petiver in 1717, called it—“*Papilio sulphureus*,” adding—“it is amongst the first to appear in the spring and again in the autumn,” and of the female says—“this being so nearly white often escapes as common.”

Abroad it has an extended range, being found all over Europe and Asia, in North Africa, and even in California.

It has not been observed in the Isle of Man, and but once in Scotland; in Ireland it is common at Killarney and in Connemara; in England it is very generally distributed and common, but is rather a southern than a northern species, being restricted in its range by the food-plant, which does not extend into the more northern counties. In 1861 my father did not see a specimen the whole season, and it was also scarce for two or three years afterwards.

GENUS VII. COLIAS.

Fabricius.

COLIAS, Linn. Colias, a surname of Venus, from a promontory of Attica, at which she was worshipped.

This genus is met with in almost every part of the world except Australia, New Zealand, the East and West Indian Islands, and perhaps Central Africa. It occurs all over Europe. In Asia it is found from Nova Zembla and Siberia to the Southern parts of India; in Africa it occurs from Egypt and Abyssinia to the Canary Islands and again at the Cape of Good Hope; in America from Grinnel Land and Boothia Felix, to Tierra del Fuego; and it is also found in the Sandwich Islands. It is, however, very much confined to the mountains in the inter-tropical countries. On the mountains of Europe, some species are found almost up to the regions of perpetual snow; and on the Himalayas, one species occurs at the great elevation of 17,000 feet.

The prevalent colour of all the species is yellow or orange, sometimes verging to white in the females, sometimes, as in the most northern species, to a greenish hue. Near the centre of the hind wings is a deep orange spot.

The antennæ are short and rather thick, and like those of *Goneptereæ*, of a reddish colour.

The males exhibit a character, often overlooked, which serves well to distinguish the species. It is a kind of a glandular sac placed upon the anterior edge of the hind-wings near the base. It is large in *Edusa*, small and lenticular in *Myrmidone*, and wanting in *Hyale* and *Chrysothome*.

About thirty species are known, nine of them occurring in Europe.

Our two British species are both noted for their periodic appearance. These periods were supposed to be influenced by the eggs or chrysalids lying dormant, but our knowledge of this genus will warrant us in considering all these suggestions as arbitrary, and unsupported by facts. It is possible, that the females may occasionally forsake the ordinary habit of the species of flying up and down one or two clover fields for hours or indeed for days together, and fly, as they can do, swiftly across the country, re-enforced by a few immigrants from the Continent, laying a few eggs here and a few eggs there, in the various clover fields over which they pass; and that the caterpillars in a favourable summer feed up rapidly, escaping their worst enemy in this climate,—mould; and so the perfect insects might be found, earlier or later, according to the climate, some inland, and large numbers in those coast districts, in which they usually occur.

Some species of the genus have been observed at great distances from land. Mr. Charles Darwin names an instance worth quoting. "One evening, when

we were about ten miles from San Blas in California, vast numbers of butterflies, in flocks of countless myriads, extended as far as the eye could range. Even by the aid of a glass it was not possible to see a space free from butterflies. The seamen called out that it was snowing butterflies, and such, in fact, was the appearance. More species than one were present, but the main part belonged to a kind very similar to, but not identical with, the common English *Colias edusa*. The day had been fine and calm, and the one previous equally so, with bright variable airs; hence, we cannot suppose that the insects were blown off the land; but we must conclude that they voluntarily took flight."

The species was most probably *Colias chrysothème*, which is found in a limited district of Central and South-Eastern Europe, but in North America occurs over a very wide range.

In his "Illustrations of British Entomology," James Francis Stephens figured and described a North American species, *Philodice* as British, under the name of *Europome*. Two others—*Palæno* and *Myrmidone*—have also been erroneously recorded as British.

COLIAS EDUSA.

Clouded Yellow.

EDUSA, Fab. Edù'sa a Roman divinity, worshipped as the protectress of children, and supposed to bless their food.

The wings, which expand from one inch and eight lines in some examples, to two inches and five lines in others, are of an exceedingly rich orange-yellow or saffron colour; and have a broad dark brown or nearly black border. This border is marked in the male with thin yellow streaks, and in the female with pale yellow spots. There is a beautiful rosy tinge in the fringe of the wings and on their front edge. The underside of the wings is of a paler yellow than the upper, taking a citron hue in some parts, and marked with black and brown. In the centre of each hind-wing is a brown-circled silvery spot.

In shape it varies considerably, especially in the hind margin of the fore-wings, which is either rounded, straight, convex or concave, and curved; the inner margin also varies, as does the shape of the hind-wings.

The colour is also subject to much variation. The brilliant orange or saffron varies in intensity, and there is the greenish-white variety of the female called *Helice*; intermediate shades between these two are to be met with, and specimens have been taken with the fore-wings of *Helice* and the hind-

wings of *Edusa*, and again with one side *Helice* and the other side *Edusa*. Some specimens are beautifully shot with blue or purple.

Var. *b.* of the female (*Helice*, Hubner) differs from the type in being of a greenish-white, in place of orange-yellow or saffron.

Var. *c.* very small, with the hind-wings subfalcate, but coloured as in the type.

Var. *d.* (erroneously supposed to be *Chrysothome* by Mr. Stephens) differs chiefly from the type in its smaller size, in the rotundity of the hind-margin of the hind-wings, its paler colour, the dissimilar form of the marginal fascia, the expanded duskiness of the base of the wings, and the black discoidal spot on the under surface of the hind-wings being paler in the middle.

Var. *e.* very much suffused with black. Suffusion is more or less common to most species; and the Canadian entomologist, Mr. W. H. Edwards, considers the application of severe cold to the chrysalis as a cause.

The usual time for *Edusa* to be seen on the wing is from August to the chilly month of November, but occasionally there is an earlier brood in May and June. The variety *Helice* is liable to be mistaken on the wing for *Melanargia galathea*, especially in chalk districts, which the latter frequents.

The eggs are oval, but very sharply pointed at each end, and are laid on the upper surfaces of leaves in an upright position, standing on end. They are shining, and at first whitish-yellow, but they rapidly turn to a darker yellow, and afterwards to pink.—Buckler.

The caterpillar, when young, is of a pinkish-brown, but afterwards changes to a velvety green. It has a yellow spiracular line, a red spot on each segment below the spiracles, and a white mark on the upper part. In general appearance it is very like that of *Pieris rapæ*, but the red marks at the spiracles are a safe guide for distinguishing them. It feeds on various kinds of *Trifolium* or clover, medick, melilot, and other *Leguminosæ* in June and July, and also in September and October.

The Chrysalis is moderately stout, but not so angular as those of the White Butterflies. The colour of the back and body is a very pale yellowish-green, with a pale yellow stripe on each side the wing-cases, which are long and well developed, projecting below the abdomen. The head is sharply pointed, and is of a dark olive-green above, and of a pale primrose yellow underneath.

It is a generally distributed species over Western, Central, and Southern Europe; the Azores; North Africa, and Syria. At the Cape of Good Hope, it is replaced by a closely allied species, the *Electra* of Linnæus; and in Lapland and Greenland by *Hecla*.

It may be found throughout the year on the Continent, even as early as February at Malta, but it is rarely seen in England before August. It is a

much commoner butterfly than *Hyale* in the British Islands, though rarer on the Continent, and is somewhat irregular in its appearances. It was particularly abundant in Britain, in 1877, but by no means so elsewhere. Clover and lucerne fields are its favourite resorts, though flowery meadows, grassy slopes near the sea, and the sides of railway banks are also the scenes of its lively flight. It has also a marked preference for the South Coast, though in 1877 it occurred all over Great Britain and Ireland, even as far north as the Orkney Islands. In one season, perhaps, hardly a solitary specimen will be seen, then in the very next, a swarm of them will spread over the Southern Counties, delighting the collector, and puzzling the naturalist to find a sufficient reason for this sudden burst of insect life; then for three or four years together it will be very scarce again. None make a finer show in the cabinet, and few tempt pursuit more strongly, than this richly coloured and nimble-winged beauty; therefore it has always been a favourite, and captures of it have been more frequently recorded in the magazines and newspapers than of any other species.

The first in England to figure and describe it was old Mouffet, in 1633.

In Ray's "Historia Insectorum," 1710, we read, "In Essexia non procul à Bocking oppido in agro Lino fato invenimus, Eadem à D. Vernon in agro Cantabrigiensi capta, æ ad nos delata est Hæc, observante D. Willughby, in Stiria frequens est. Unde Patet multas Papilionum species Angliæ cum reliqua Europa communes esse."

In Petiver's "Papilionum Britannicæ Icones," 1717, we read, "*Papilio crocea*, limbo nigricante. The Saffron Butterfly seen about Deptford, Peckham, &c., from June till September."

In Harris' "Aurelian," 1775, we read, "This beautiful fly is taken in meadows in the month of August, they fond of settling on the yellow lupins and thistles. They have been taken flying in plenty in Epping Forest, but as they seldom haunt one place for many successive seasons, I cannot venture to mention it as a place where they are to be found. Where there is a brood, the times of the day to find them are at eight in the morning and four in the afternoon, but never in the middle of the day, when they conceal themselves to rest. They fly very fast, therefore not easily taken, the male in particular flies exceedingly fast." To this my father adds a note "I never saw them fly but in the middle of the day."

In Donovan's "Natural History of British Insects," 1792, we read, "With us it has ever been esteemed as a rare insect, though seen this season in Kent in greater plenty than for several years; but as they were probably only an accidental brood, they may again disappear for a considerable time."

In Lewin's "Insect of Great Britain," 1795, we read, "This beautiful

species of butterfly is peculiar to rich meadow lands, and not common. It is on the wing the latter end of August and the beginning of September. I have met with it in many different places, but never have seen more than two or three flying at a time. It is quick in flight, and not easily taken, except about eight or nine o'clock in the morning, when feeding on the flowers then in bloom." A retrospect of the occurrence of *Colias edusa*, in Britain, since the days of Lewin, may not be without interest.

In 1797, it occurred in great plenty at Wrentham in Suffolk.

In 1804, it was abundant at Clapham and other places near London, and also in Dorsetshire, and the Isle of Wight.

It was also common in 1808, the year in which my father began his "Entomological Diary."

In 1809, *Edusa* was very scarce, but one of the white variety was seen at Thetford, and plenty of *Hyale* at Horning, Norfolk, by Mr. Mack.

In 1810, I can find none recorded.

In 1811, it was very common, and several were taken in June.

In 1812, I can find none recorded, and very few for 1813 and 1814, and none in 1815, 1816, or 1817. The winter of 1813-14 was so severe that an ox was roasted on the Thames.

In 1818, a splendid year for butterflies and one with an unusually hot summer, it occurred abundantly, and a few were taken in the month of July.

None were recorded in 1819, a good year for *Antiopa*, 1820 and 1821, a good year for *Hyale*.

It was common again in 1822, but none were recorded in 1823 and 1824, and but one in 1825.

It was common in 1826, the "*Annus mirabilis*" of English Entomologists, and so were also *Hyale*, *Cardui*, *Atalanta*, and *Phlœas*.

None were recorded in 1827, 1828 and 1829; 1829 a year which had a remarkably wet sunless summer, followed by one of the most severe winters of the present century, there being, even at Florence in Italy, forty-eight days of frost; nor in 1830.

It was plentiful in 1831, there being a considerable flight in the neighbourhood of Dover, during the months of August and September.

Scarce in 1832, a year which had a cold backward spring, succeeding a mild and open winter; 1833, though common in Jersey, and 1834.

It was common in 1835 (appearing in profusion at Killarney), as was also *Hyale*, and it was also common in 1836.

It was scarce in 1837 and 1838, but common in 1839, many being taken in June.

It was scarce in 1840, 1841 and 1842; 1842 a year which had a remarkably

fine hot summer, and one which produced *Hyale* in more than usual abundance, and very favourable to the production of insect life. Of 1842, the Rev. W. T. Bree writes, "Mr. Le Plastrier informs me that they had no Clouded Yellows last summer about Dover, except *Hyale*, where, in certain seasons, they are to be seen in considerably plenty." The White butterflies were particularly abundant that year.

In 1843, it was abundant again, and it was also very common in 1844, as was also *Hyale*.

In 1845, it was particularly scarce, and none were recorded in 1846 a good year for *Antiopa*.

It was scarce in 1847, but one was taken in the Isle of Arran (first in Scotland), once recorded in 1848, none in 1849 and 1850, one in 1851, scarce in 1852, and none recorded in 1853 and 1854.

It was common in 1855 and 1856, very common in 1857, one being taken as late as the 18th of November, and also very common in 1858, especially in June, but still taken as late as November 7th.

In 1859, a year with a fine hot summer, it was very abundant all over England, but *Hyale*, which was common in 1857 and 1858, was very scarce; it was, however, a good year for the *Sphingidæ* or Hawk-moths.

It was very scarce in the cold sunless years of 1860, 1861, 1862, & 1863.

It was common in the fine seasons of 1864 and 1865.

Several were taken in 1867, 1868, a year with a particularly hot summer, the great season for *Hyale* and the *Sphingidæ*, and in 1869.

It was very scarce in 1870, a fine year, and probably the driest of the present century.

It was only once recorded in 1871, and was not common in 1872, the great year for *Antiopa*.

In 1873, not a specimen appears to have been taken, and very few in 1874.

It was common again in 1875 and 1876.

Now comes its great year—1877, in which it appeared in greater numbers than it had ever been known to do before, occurring in many places where it was previously unknown, as for instance the Orkney Isles. Several of the white variety *Helice*, were also taken that season. Although so abundant in Britain that year, it was very scarce on the Continent.

One of the grandest sights I ever saw in my life, was on a little undercliff to the East of Lulworth Cove, on the 5th of September, 1877. On this undercliff grows a mass of *Inula Crithmoides*, then in full bloom; below is the clear blue water of Weymouth Bay, unruffled by a ripple. Every one of its yellow flowers was literally covered with one, two, or more of *Colias edusa*, with its white variety *Helice*, *Cardui*, *Atalanta*, *Rapæ*, *Io*, *Phælas*,

Janira, Corydon, Alexis, Agestis, Sylvanus, Linea, Actæon, and Galathea.

The year 1877 began with an exceptionally mild wet winter, and a long, chilly, disheartening spring, so writes C. Barrett, Esq. However, with the beginning of June, the weather began to improve, and, on the 4th, our first warm day, *Colias edusa* made its appearance. Two days later, I found several more, and from that time until the 4th of July, they were to be found in moderate numbers all over the country on every sunny day. It is a curious circumstance, that along with *Edusa* there appeared an early brood of *Scopula ferrugalis* in considerable numbers. By the end of the first week in August, after a deal of wind and rain, the second brood of *Edusa* appeared, again accompanied by *Scopula ferrugalis*, but not by *Hyale*. September was a beautifully fine and warm month throughout, and *Edusa* appeared in the greatest profusion, but gradually got scarcer and more worn and feeble towards the end, so that the conclusion forced itself upon one's mind, that hibernation in their case was impossible, as they would have insufficient vitality.

In some sheltered situations in Kent, and other parts of the South Coast, a third brood appeared in October, and continued on the wing till the second week in November, when the chilly blasts of the coming winter became too much for it.

On the 6th of August, 1877, the late Mr. William Buckler hearing that the second brood of *Colias edusa* was flying in great profusion, induced a friend to net him a few of the shabbiest females he could meet with. By the evening one of these laid some eggs, which hatched in a few days. The caterpillars continued to feed and grow, consuming a great deal of food, and stripping bare the stems of plant after plant. On the approach of cold frosty nights, they remained stretched out still and passive, seeming to feed only by day. On the 15th of October, one changed to a chrysalis, followed by two more on the following day. On the 22nd, another assumed the chrysalis state, and by the 27th, eight other caterpillars had spun themselves up in a horizontal position, in a similar manner to those of the genus *Pieris*. It was formerly supposed to hibernate in the perfect state, and it was first found to do so in the chrysalis state by Mr. Dale, in the year 1867.

In 1878, after another mild winter, a few imagos of *Edusa* were seen in April, May, and June, after which it was particularly scarce. One, however, was taken on ivy bloom in the middle of December.

In 1879, the great year for *Vanessa cardui* and *Plusia gamma*, and one which had the wettest and most disastrous summer of the present century, it was abundant in Kent and Sussex during the month of September, but apparently not so in other parts of England.

It was scarce in 1880, 1881, 1882, 1883, and 1884. The winters of 1880 and 1881 were very severe.

In 1885, a year with a fine late summer, it was fairly common, but very scarce again in 1886.

COLIAS HYALE.

Pale Clouded Yellow.

HYALE, Linn. Hyale, a nymph in the train of Diana. Ovid, Met. III. 470.

The wings of this interesting butterfly are of a primrose yellow, and are from two inches, to nearly two inches and a quarter in expanse.

The sexes are nearly alike in their markings, the chief difference being in the paler ground tint of the females.

There is some risk to beginners of confounding this species with the white variety of *Edusa* named *Helice*, so it may be as well to point out the principal distinction between the two. The dark border of the upper wings of *Edusa*, is of nearly equal breadth along the whole of the outer margin, and at the lower corner is continued inwards for a short distance; whilst in *Hyale* this border narrows rapidly, and disappears before reaching the lower corner of the wing. The dark border of the hind-wings also is much broader in *Edusa*, than in *Hyale*.

Var. *b.* differs from the type in the ground tint of the wings being almost white. It is admirably figured in Lewin's "British Insects" and is the var. *pallida* of Robson and Gardner's list.

Var. *c.* has the fore-wings suffused with black scales as far as the discoidal spot.

There are also other varieties: one has only a few black marks at the tip of the forewings; another has the border so broad that, but for the want of it on the hind-wings, it might do duty for *Helice*. One variety has been named *Sareptensis* by Dr. Staudinger. It has the hind margin of the fore-wings broadly black, and occurs on the southern Steppes of Russia.

The egg is apparently smooth, but really ribbed and of a pale canary-yellow, reminding one of a canary seed in miniature.—Buckler.

The caterpillar is of a dull green colour, with a white or yellow spiracular line, and the whole skin covered closely with short black spines or bristles. It feeds on *Trifolium repens* and *Medicago lupulina*, Lucern, &c., in August and also in October. In repose, it lies along the middle of the leaf's superior surface, so that at night when the leaf closes, as most, if not all, of the *Trifolium* tribe do, it is quite enclosed by its segments.

The Chrysalis is very similar to that of *Edusa*, green, with a yellow lateral longitudinal line.

This interesting butterfly used to be considered a great rarity in England, frequenting the South Eastern corner, but has been gradually extending its range, along with the increasing cultivation of lucern and various other species of the clover kind, on which the caterpillar feeds, and amongst the seeds of which the eggs may possibly be introduced into fresh localities. It is double-brooded, but is commonest in Central Europe in the autumn, though in the South it may be found throughout the year, and has been noticed in Malta as early as March.

Its range extends over the whole of Europe except the North, Western and Central Asia, China, and Japan (where there is a very striking temperature form, measuring only one and three quarters of an inch in expanse, and emerging in February); the Mauritius, and North Africa. It is generally one of the very commonest autumn butterflies in fields and meadows on the Continent of Europe; and its flight is much less rapid than that of *Edusa*.

This species appears to have been first observed in England by Lewin, who in his "Insects of Great Britain" published in 1795, wrote thus, "This is a very rare species of butterfly. In all my researches after insects I never met with it but in the Isle of Sheppey, and on a hilly pasture field near Ospringe in Kent. I found it in different years in both places, and it appeared to be locally attached to the spot. It is out in the winged state the middle of August, and is not difficult to take on the wing, as it does not ramble far or fly swift." Of the white variety he writes, "This species is likewise very rare. I met with a brood of these butterflies in a gravelly pasture field in Kent, and they were all of the same pale yellow colour, but in every other character they perfectly agreed with the above described; and it is a doubt with me, whether this be a distinct species, or only a variety in colour. This fly is likewise on the wing the middle of August."

In 1803, it was recorded as being very rare, by Mr. Haworth.

In 1809, it was seen in plenty at Horning, Norfolk, by Mr. Mack.

The next account of it we have is by Mr. J. F. Stephens in his "Illustrations of British Entomology" published in 1828, as follows "I have seen very few specimens, and until the last season, only three recent captures had come to my knowledge. The first of these was found in August, 1811, at Wrentham in Suffolk by the able artist (C. M. Curtis), to whose pencil I am indebted for the figures with which this work is embellished, and is in his brother's (John Curtis) collection. The second specimen was taken in Epping Forest, in June, 1819, and the third subsequently at Brighton; but last season many

specimens were captured near the last named place, by a person residing in that town."

In 1829, John Curtis wrote in his "British Entomology:" "This rare insect is generally found near the coast, especially of Suffolk, Kent, and Sussex, from the beginning of August to the first week in September."

In 1831, the Rev. W. T. Bree writes in the "Magazine of Natural History" "*Colias hyale* appears to be a maritime fly, occurring almost exclusively near the sea coast. Mr. Le Plastrier possesses a beautiful series of specimens of this rare insect, taken chiefly, if not entirely, near Dover."

In 1835, it was quite common in the South-Eastern counties, and a single specimen was taken near Ross in Herefordshire, which appears to have been the first observed west of Surrey. *Edusa* was also common in 1835.

In 1842, the Rev. W. T. Bree writes in the "Zoologist": "The summer of 1842 was one of the finest we have had for many years, and therefore favourable to the production of insects; but what strikes me as strange is, that the same season which produced *Hyale* in more than usual numbers, should not have been equally productive of the allied species, *Edusa*."

In 1842, *Hyale* occurred abundantly in the Eastern and Southern counties, and specimens were taken as far North as York, and as far West as Wilton in Wiltshire, and the Isle of Wight.

In the "Entomologist" for 1842, J. F. Stephens writes, "Of *Colias hyale*, which seems to prefer chalky districts, and to make its appearance after a fine and hot summer; I saw seven specimens in a deep chalk-pit on the Southern side of the down, near Guildford."

In the same volume, Mr. Thomas Desvignes writes, "You may safely state that it only appears every seven years (perhaps one or two may be seen in the interim.) Ever since I took them near Brighton in 1835, I foretold that it would taken in 1842, which turns out to be true. The time of its appearance is from the 15th of August, to the middle of September, but I recollect seeing some specimens that were taken in June, by Le Plastrier at Dover. They are very much pursued by *Pieris brassicae*, which appear to be continually tormenting them, seldom allowing them to settle; and should they survive the day, the following day they are very much worn, and the wings chipped. I have watched two males fighting and soaring in the air till nearly out of sight. They invariably settle on the flower of the lucerne, on which I should say they deposit their eggs, and which have been introduced into this country with the seed originally imported from Switzerland. In 1835, I took fifty specimens in several fields near Brighton, and this year twenty-two in fields in Northamptonshire, probably the most inland county in England where *Hyale* has been captured."

In 1843 and 1844 several of *Hyale* were taken, but more of *Edusa*.

In 1847, both *Hyale* and *Edusa* were taken at Lyme Regis in Dorsetshire.

In 1848, it was only once recorded, as was also *Edusa*.

In 1849, not more than twenty specimens were captured, which entirely broke down the theory of its septennial appearance.

In 1850, it was only once recorded.

In 1855, it was rare but *Edusa* common.

In 1856, a couple were recorded.

In 1857, it was very common in South-Eastern counties as was also *Edusa*.

In 1858, it was again common and *Edusa* also.

In 1859, it was only once recorded but *Edusa* was very common.

In 1865, a few were taken.

In 1867, it was only once recorded.

Now comes the great year 1868, in which it appeared in greater numbers than it has ever done before or since, and a few stragglers were found as far North as Yorkshire and Lancashire, and others at Killarney and Howth, in Ireland.

In the end of July and beginning of August, *Hyale* was the commonest butterfly to be seen at Margate, where the specimens were flying by hundreds. It was a lovely sight to see these handsome creatures settled on flowers, and swaying to and fro in the wind: the rich gold colour of their under-side contrasting beautifully with the purple flower of the lucerne.

" On the gay bosom of some fragrant flower,
They idly fluttering, live their little hour,
Their life all pleasure, and their task all play,
All spring their age, and sunshine all their day."

Mrs. Barbauld.

Hyale was abundant all over the Isle of Thanet, wherever a little patch of lucerne was to be seen, it was sure to be there, even close to the houses. It also appeared that year in great abundance at Gravesend, Colchester in Essex, Cromer in Norfolk, the Isle of Wight, and all along the coasts of Kent and Sussex. A few specimens were taken as late as the 24th September, between Faversham and Canterbury.

In 1869, one was taken in the New Forest, and in 1870 it was scarce, as was also *Edusa*, although it was a fine dry year.

In 1872, the great year for *Antiopa*, *Hyale* occurred commonly on the Sussex and Kentish coasts, but not *Edusa*.

In 1873 and 1874, it was very scarce.

In 1875, *Hyale* was very common again, and several were taken in May and June, being apparently the first year in which the spring-brood has been observed in England. Some specimens were taken as far inland as Birming-

ham. In Suffolk, Essex, and Kent, it appeared in greater abundance than it has done since 1868. *Edusa* was also very common in 1875.

In 1876, both species were common again, and I took a specimen of *Hyale* near Sherborne, being the only one I ever saw alive. This I record as showing how scarce a species it is in the West of England.

In 1877, the year in which *Edusa* appeared in its greatest profusion; very few specimens of *Hyale* were seen, and since then only a couple have been recorded, one in 1881, and the other in 1885.

Family LYCÆNIDÆ.

This is a very extensive family of small, but extremely beautiful butterflies, the European representatives of which are known by the names of Hair streaks, Coppers, and Blues; the former from the peculiar slender hair-like lines on the under surface of the wings; the two latter from the prevailing colour of the upper surface. It is divided into about forty genera, which include fully 1200 species, being nearly nearly twice the number known thirty years ago. Many of the East Indian and American species, far outstrip the European in the brilliancy of their colours.

"Dipt in the richest tincture of the skies,
Where light disports in ever mingling dyes,
While every beam new transient colour flings,
Colours that change when'er they wave their wings."

Pope.

In the chrysalis state, this family bears a close resemblance to the *Papilionidæ* and *Pieridæ*, not only by being attached by the tail, but also by being supported with a belt of silk, which passes round the middle of the body, and is firmly fixed on each side.

The caterpillars somewhat resemble woodlice, and are termed onisciformes.

GENUS VIII. THECLA.

Fabricius.

Thec'la, a Virgin and Martyr. Butler's lives of the Saints, ix. 286.

Thecla is a genus of which between five and six hundred species are now described. Its head-quarters appear to be America, where more than nine-tenths of the species occur. In Brazil are some of the largest and most brilliant species of the family. A few are found in Asia and Africa, nine or ten in Europe, of which five are British. Most of the species possess tails to the hind-wings, in that respect resembling those of the genus *Papilio*.

Many of them have one or more fine lines across the underside of the wings, whence arises the name "Hair streaks." A curious characteristic of the genus is, that the members of one sex often have a satin or plush-like patch on the fore-wings, at the extremity of the discoidal cell. The caterpillars appear to frequent trees and shrubs instead of herbaceous plants, as is the custom with those of the allied genera; and the perfect insects are enabled, by their robust structure, to fly with great power over the branches of even the highest oaks and other forest trees.

Writers have divided this genus into two or three sub-genera. Dalman separated those species in which the males have a velvety patch on the fore-wings, under the name *Zephyrus*. This arrangement is followed by Kirby, in his "Catalogue of Diurnal Lepidoptera." Hubner, however, had made the same division at an earlier date, and had still further divided the group. Those in which the males had a velvety patch on the fore-wings, he called *Bithys*; those without a patch, *Strymon*; and the tail-less species he called *Lycus*. To those who study British insects only, this sub-division may appear unnecessary, but the advantage is very apparent when we consider the large number of species. Each sub-genus has its British representative, as will be seen.

SUB-GENUS BITHYS, Hubner.

ZEPHYRUS, Dalman.

Females with a more or less velvety patch on the fore-wings.

ZEPHYRUS is a bad generic name, being the specific name of one of the *Polyommata*.

THECLA BETULÆ.

Brown Hair-streak.

BETULÆ, Linn. Bet'ulæ, from the generic name of one of its food-plants the birch, *Betula alba*.

This is the largest species of the genus found in Europe, measuring sometimes an inch and two-thirds in expanse. The sexes differ considerably on the upper side, the male being of a deep brown colour, slightly paler near the centre of the fore-wings, whilst the female possesses on the front wings a large patch of clear orange. Both sexes have several orange marks upon the lower angles of the hind-wings. On the underside the general colour is a tawny orange with duller bands, and marked with one white line on the fore-wings and two parallel white lines on the hind-wings.

This butterfly is later on the wing than any other species of the genus. The earliest specimens emerge in the end of July, and they continue to appear for some time, remaining out till September or even October.

The eggs are white, and are somewhat like those of *Quercus*. They are attached to the twigs of the food-plant, and do not hatch before the spring.

The caterpillar is of a bright apple-green, with pale yellow lines and two rows of oblique streaks of the same colour. It feeds on blackthorn, birch, and alder in May and June.

The chrysalis is short, obese, and of a clear red-brown colour.

Three species of Hymenopterus parasites, belonging to the family Ichneumonidæ, have been bred from *Thecla betulæ*, viz.: *Agrypon flaveolatum*, *Campoplex pugillater*, and *Campoplex eurynotus*.

Thecla betulæ has not a wide range, but occurs in Central Europe, and the South of Russia. It also extends into the Southern parts of Siberia and the valley of the Amoor.

It has not been noticed in the Isle of Man, nor in Scotland, but is very common in the lanes and road-side hedges in the South and West of Ireland in August, frequenting the flowers of the bramble, and settling the moment the sun is obscured. It has not been observed in either Ulster or Leinster. In England it is very widely distributed, being most common in the counties of Devonshire, Lancashire, Essex, and Cambridgeshire. It appears to be entirely absent in the North-Eastern portion, not occurring in Yorkshire, Durham, nor Northumberland, and seems to have become extinct in the counties of Dorsetshire and Norfolk.

The first specimen recorded in England appears to have been taken at Croydon, by the Rev. John Ray, on August 31st, 1702.

Eleazer Albin, in 1720, writes thus, "The caterpillar is of a light sea green colour. It was taken near Hornsey Wood, on the 8th of June; it tyed itself up after the manner of the White Butterflies, and on the 16th of July came forth the Hair-streak Butterfly. This caterpillar is very rare and scarce to be met with."

Lewin, in 1795, writes, "This insect is very far from common, but the fly may be taken on the tops of hedges, and particularly on the maple tree, on which it delights to settle. The caterpillars are very singular in their form, and at first sight appear like woodlice, lying flat on a leaf or twig, without the least sign of feet; and when they travel their motion is more like that of a slug than that of a caterpillar."

Haworth, in 1803, records it as being rare.

Stephens, in 1828, writes "Coombe and Darenth Woods are its chief residences near London, but it cannot be esteemed a common species anywhere."

Curtis adds, "It has also been taken in Norfolk, Suffolk, Devon, Dorset, &c."

None appear to have been taken in Dorsetshire since 1842.

THECLA QUERCUS.

Purple Hair-streak.

QUERCUS, Linn. *Quercus*, from the generic name of its food-plant, the oak (*Quercus Robur.*)

This species varies in the expanse of its wings from about an inch and a quarter to an inch and a half. The sexes differ considerably on the upper side, the male being entirely of a blackish brown above, with a purplish gloss; whilst the female possesses on the front wings a purplish blue blotch towards the base. On the underside, the wings are of an ash colour, with a distinct white line running across them, and with a couple of orange dots at the inner corner of the hind wings.

The egg is of the shape common to the family, only larger than that of any of our Blues. It is round in outline, flattened, and with the exception of a central depression on the upper surface, covered with irregular oblong reticulation, and the egg looks quite like a rough *Echinus* in miniature. The shell under the reticulation apparently has a very pale pinkish brown tinge: the lines of the reticulation are white (Rev. J. Hellins). The eggs are laid on the twigs of the oak in August, and remain firmly glued to them throughout the winter.

The caterpillar, which feeds on the oak in May and June, is reddish-brown, covered with short hairs, and with several rows of dark greenish lines or dots. It is short and obese, and in appearance resembles a woodlouse.

The chrysalis is ferruginous, with three dorsal rows of brown dots. In changing to the chrysalis state, the caterpillar spins a few threads, making a frail sort of cocoon just on or just below the surface of the earth, or availing itself of the shelter of a fallen leaf.

This is at once the commonest and the handsomest of the Hair-streaks, being found in every part of England, where there is an oak wood, and looking like a small Purple Emperor, with its rich gloss of the imperial purple. It is also common in Ireland; but in Scotland it is a very local species, not occurring in the Northern or North-eastern counties. On the Continent it is generally distributed, except in the North and extreme South, and its range extends into Asia Minor. The butterfly is seen in July and August, flitting about in sportive groups round oak and ash trees, and occasionally descending within reach of the net.

The Rev. John Ray, in his "Historia Insectorium," mentions that "he took a pair sitting on nettles at Croydon, on the 8th of July, 1692, and that the caterpillar is very similar to a woodlouse."

SUB-GENUS STRYMON.

Hubner.

Females with no velvety patch on the fore-wing.

THECLA W-ALBUM.

Black Hair-streak.

W-ALBUM, Knoch. W-al'bum, on account of the white W on the under-wings.

This species averages about an inch and a half in the expansion of its wings.

This is very much like the next in appearance. On the upper side it is a very dark brown, almost black, with an orange spot at the anal angle of the hind-wings, often very indistinct. On the under side it is of an ashy brown, with a row of orange lunules at the hind margins, most distinct at the anal angles. A white hair-like line crosses both wings, and forms a W near the inner margin of each. This last character will at once distinguish it from the next species, *Pruni*.

The eggs are laid on the twigs of the elm and wych elm in July and August, and in shape are somewhat like an orange, but are more depressed on the crown; they are of a whitish colour, and remain firmly glued to the rind of the twigs throughout the winter (Newman.)

The caterpillar is pale green, with short brownish oblique streaks on the side, sometimes with two rows of red spots down the back, and a dull red stripe on each side above the feet. The head is dark brown and retractile, and the body is covered with soft delicate hair. It feeds on elm, wych elm, and also blackthorn in May and June.

The chrysalis is short and obese, ferruginous, with three dorsal rows of brown dots.

An ichneumon fly, viz. *Perilitus scutellata* had been bred from it.

The butterfly appears at the end of June or in July, and continues on the wing till August.

It is found in Central and Southern Europe, and Northern and Western Asia; but seems to be everywhere confined to very restricted localities, and to be of somewhat uncertain appearance.

It is unknown in Ireland, Scotland, and the Isle of Man. In England it is widely but not generally distributed, and does not occur north of Yorkshire; nor is it found in Wales, or the South-western counties.

The first to record it as a British species appears to be Lewin, who in his "Insects of Great Britain," writes thus, "This butterfly is not common.

is first seen out on the wing about the middle of July, and is then sometimes to be seen flying about the bramble blossoms, and frequently settling on them to feed, when it may easily be taken."

In his "Illustrations of British Entomology," J. F. Stephens writes thus, "This species is usually esteemed a scarce insect in the neighbourhood of London, and previously to the last season I never saw it alive; but the boundless profusion with which the hedges, for miles, in the vicinity of Ripley, were enlivened by the myriads that hovered over every flower and bramble blossom, last July, exceeded anything of the kind I have ever witnessed. Some notion of their numbers may be formed, when I mention that I captured, without moving from the spot, nearly 200 specimens in less than half-an-hour, as they successively approached the bramble bush where I had taken up my position. How to account for their prodigious numbers I am perfectly unable, as the same fields and hedges had been carefully explored by me at the same and different periods of the year for several preceding seasons, without the occurrence of a single specimen in either of its stages; and it is worthy of remark that the hedges to the north and north-west of the town were perfectly free, although the brambles, &c., were in plenty. A few specimens were also taken near Windsor, and in Cambridgeshire, and I believe, near Ipswich, during the past season. The entomologists of this last town, Mr. Kirby informs me, do not esteem it a scarce insect; its usual time of appearance is the end of June, and it continues till the middle of July." In the "Zoologist" for 1847, Mr. Stephen adds, "Although I frequented the same locality for thirteen years subsequently; sometimes in the season, for a month together, I have not seen a single specimen there; but in 1833, I caught one specimen at Madingly Wood, near Cambridge."

"In 1829 or 1830," so writes the Rev. C. S. Bird, "this insect appeared in the greatest profusion in my own garden, at Burghfield, near Reading."

It has also been obtained at Melton Wood, near Doncaster, in Yorkshire; Ashton and Barnwell Wolds, in Northamptonshire; Stilton, in Huntingdonshire; New Forest, Hampshire; Allesley, in Warwickshire; and in the neighbourhood of Bristol.

In 1873, it appeared in great abundance in Savenoke Forest.

THECLA PRUNI.

Dark Hairstreak.

Pruni, Linn. Pru'ni, from the generic name of its food-plant, the Blackthorn, *Prunus spinosus*.

This species averages about an inch and a quarter in the expansion of its wings. On the upper side it is a very dark brown, sometimes almost black, and has near the hinder edge of the hind-wing a few orange spots. This last character will at once distinguish it from the previous species, *W-album*. On the underside it is an ashy grey, and has a broad band of orange, with a row of black spots on its inner edge, and a silvery blue line.

The caterpillar is green, with oblique yellow lines on the sides, and dark marks down the back. It feeds on blackthorn in May.

The chrysalis is brown, obese, with lighter markings, and darker tubercles.

The butterfly emerges at the end of June or July, and frequents woods in Central Europe, France, Italy, Scandinavia, Dalmatia, and the mountainous districts of Western Siberia. In this country it is confined to very few counties: Huntingdonshire, Northamptonshire, Buckinghamshire, Derbyshire, and the extreme south of Yorkshire.

It was not known to be a British species until September 1828, when a member of the Entomological Club, purchased a number of specimens from a Mr. Seaman, then a well-known dealer in objects of natural history, and resident at Ipswich. The purchase was made under the impression that the butterflies were the Black Hair-streak (*W-album*), then a desirable insect to obtain. Seaman, unconscious of the value of his capture, had given the real and familiar locality of Monk's Wood, in Huntingdonshire, as the habitat, but as soon as it was known that the butterflies were not the Black Hair-streak at all, but a species new to Britain, he determined to move the mine of wealth to Yorkshire; and Mr. Curtis, who shortly afterwards published the butterfly under its correct name, gave Yorkshire as the county where it had been found.

In an appendix to his "Illustrations of British Entomology," 1834, Mr. Stephens writes, "The insect occurs in profusion in Monk's Woods, Hunts., towards the end of June, at which period it was taken by C. C. Babington, Esq., and in the beginning of July I had the pleasure of capturing it there myself."

In 1832, several were taken by Mr. Henderson, in Melton Wood, near Doncaster.

In 1837, my father met with it as late as the 17th of July; and in 1842, Mr. Doubleday as early as the 18th of June.

In the Zoologist for 1852, the Rev. W. Bree writes, "*Thecla pruni* is very uncertain in its appearance. In 1837, it literally swarmed in Barnwell and Ashton Wolds, Northamptonshire. I do not scruple to say that it would have been possible to capture some hundreds of them, had one been so disposed; for the last few years it has appeared very sparingly indeed."

In the "Weekly Intelligence" for 1858, Mr. Sturges writes, "In a box of insects captured within a few miles of Chesterfield I find this very local species."

In the "Entomologist" for 1874, Mr. Thompson writes, "*Thecla pruni* in Buckinghamshire. On the 4th July, being at Linford Woods, I captured several specimens of *Thecla pruni*, on flowers of the privet, mostly females."

SUB-GENUS LYCUS.

Hubner.

Species without the small tail on the hind-wings, and the streak on the underside wanting or less distinct.

THECLA RUBI.

Green Hair-streak.

RUBI, Linn. Ru'bi, named after the bramble (*Rubus fruticosus*), on which it was formerly supposed to feed.

This may be easily distinguished from all other of our British butterflies by the green colour of the underside; and from the other Hair-streaks by possessing no tails. The colour of the upperside is brown, and the wings expand about an inch and a quarter. The female has occasionally a pale whitish oval dot near the middle of the forewings towards the costa.

The caterpillar is of a yellowish green, with a brown dorsal stripe, and oblique white stripes on the sides, and covered with minute raised points bearing fine short bristles. It feeds on *Genista tinctoria*, and on Broom, in June and July. When about to undergo its change, it enters the earth, but only just beneath the surface.

The chrysalis is short and obese, rather rounded, and of a dark, dull purplish brown colour, covered with short dark brown bristles.

The butterfly appears on the wing in the end of April, and continues out till June. Stray specimens are sometimes met with in July and even in August.

It occurs all over Europe except the Polar regions, North Africa, and Northern and Western Asia, as far as Persia. In California there is a closely allied species—*Dunetaria*, which is, perhaps, only a geographical variety.

It appears to frequent open places in woods, and bushy overgrown land, lanes, &c., and to be generally distributed throughout the British Isles, occurring as far north as Rosshire.

The first English author who appears to have known it was Dr. Merrett, in 1667.

Petiver, in 1702, gives it as occurring in the West of England, Cambridge, and about London.

GENUS IX. CHRYSOPHANUS.

Hubner.

CHRYSOPHANUS, from Chryson—gold, and Phaino—to appear.

The relationship of this genus to the next is unquestionably very close, but the splendid coppery colour of the upper surface of the wings, the naked eyes, and the very spinose feet, seem to warrant their generic separation. There has been a considerable diversity of opinion as to the employment of the generic names of the two groups. Fabricius included both under the name of LYCÆNA. Latreille employed the name POLYOMMATUS for the whole of the species of the family LYCÆNIDÆ, giving one of the Blues as an example of the genus. Stephens employed the name of LYCÆNA for the Coppers and of POLYOMMATUS for the Blues. On the other hand, Boisduval employed the name of POLYOMMATUS for the Coppers and that of LYCÆNA for the Blues. But Hubner's name CHRYSOPHANUS is far more applicable to the present group, being quite expressive of their splendid appearance.

The species of this genus are for the most part European; a few species are, however, scattered over most parts of the world. The species found in Europe are about fifteen in number, only one of which is to be found in the British Isles at the present day. Another formerly inhabited the fens of Huntingdonshire, and three others have been recorded as British, but apparently upon rather doubtful authority.

CHRYSOPHANUS DISPAR.

Large Copper.

DISPAR, Haworth. Dis'par, unlike; on account of the disparity in appearance of the sexes.

Some years ago, this was the pride of English entomologists, for we were supposed to have a butterfly entirely to ourselves, it being unknown on the Continent, whilst it literally swarmed in some of the fens of Huntingdonshire and Cambridgeshire.

The two sexes differ very remarkably in the appearance of the upperside. This in the male, is of an effulgent coppery colour, with a narrow black hind margin. Above the centre of each fore-wing, are a larger and smaller black spot. Above the centre of each hind-wing, is a black streak. The female has two larger black spots above the centre of each fore-wing, and a row of seven between the centre and the hind margin, which is broader than that of the male. The hind-wings of the females are much suffused with black scales, and have a band of coppery-red near the margin, extending also more or less

distinctly along the courses of the veins. On the underside both sexes are nearly alike, the hind-wings being of a general light blue tint, with black spots, and a red band near the margin; and the fore-wings having a yellowish tinge, with a row of seven black spots between the centre and the hind margin, and another row of three between the middle and the fore margin.

The expanse across the wings varies from one inch and five lines to two inches and two lines. Very few varieties are known. There is a female in my own collection, which is almost entirely black, and a specimen in Mr. Sidebotham's collection seems to approach the variety *Schmidtii* of *Phleas*, having the forewings inclining to silvery towards the hind margin. On the Continent occurs the variety *Rutilus*, which is smaller, and has smaller spots, and is found in France, Germany, and Italy. It has been recorded as British under the name of *Hippothoë*. Concerning this, my father wrote in "Loudon's Magazine," for 1834, "Mr. Haworth told me that they came out of an old cabinet called the Kentish Cabinet, and were said to have been taken near Faversham. I had a male and a female from the late Mr. Latham, which were from Capt. Lindegren's cabinet, whence, probably, all the supposed British specimens came."

The caterpillar is somewhat hairy, bright green, with innumerable white dots. It used to feed on the Great Water Dock (*Rumex hydrolapathum*), and was hatched from the egg in August or September, and hibernating before growing much, reappeared in spring to feed up by May or June.

The chrysalis was at first green, then pale ash-coloured, with a dark dorsal line, and two abbreviated white ones on each side, and lastly sometimes deep brown (Stephens). It was very obese, blunt at both extremities, attached by minute hooks at the caudal extremities, and also by a belt of silk round the middle (Newman.)

The butterfly used to emerge from the chrysalis state in June and July, the 25th of June being the earliest known date.

Some butterflies of this very rare species, so Lewin, in 1793 informs us in his "Insects of Great Britain," were met with by a gentleman in Huntingdonshire, on a moorish piece of land, and were afterwards sent to Mr. Seymour, F.L.S., of Dorsetshire, who presented them to the late Duchess Dowager of Portland.

Haworth, in 1803, informs us in his "Lepidoptera Britannica," that the butterfly in July frequents the marshes of Cambridgeshire in certain but undeterminable years. That it is a new and very beautiful species to England, lately detected by himself and his very dear friends W. Skrimshire and F. Skrimshire, M.D., and formerly in Wales by the celebrated botanist Hudson; but nowhere in Scotland, as Donovan hath said from erroneous information.

Mr. William Hudson, on the institution of the British Museum, in 1756, was made one of the assistant librarians. He resigned this office, however, in 1758, in order to pursue his profession as an apothecary. In 1762, he published his well-known work "Flora Anglica," in which the indigenous plants of England were arranged according to the Linnæan system, and he was soon after made a Fellow of the Royal Society. In 1778, was published a second and improved edition.

The Messrs. Skrimshire first saw the Coppers as they going to Ely in a gig in 1797 or 1798, but took little notice. On returning they saw one settle on the road, and they knew it was not a common one.

The next specimens were taken at Whittlesea Mere, by Thomas Speechley, an old boatman in my father's employ, in July, 1819, and subsequently by my father himself and the Messrs. Standish. It appears to have occurred in great plenty, as several hundreds were taken within the next ten years by the London collectors, who visited Whittlesea and Yaxley Meres, during the month of July, for the sole purpose of obtaining specimens. In 1827, Mr. Haworth took fifty specimens in a single day in Bardolph Fen, Norfolk; a few also were taken at Benacre, in Suffolk.

In Loudon's "Natural History" for 1834, is the following fact communicated to the Rev. W. T. Bree, by Mr. Haworth. "Some entomologists once made an excursion into the fens, for the purpose of taking the beautiful *Lycæna dispar* or Large Copper butterfly, which it is well known frequents low marshy grounds. The Coppers were captured in great abundance. It so happened that the following winter proved to be a very wet one, and the entire tract of land where the Coppers had been found was completely inundated, and actually lay under water for a considerable time. The entomologists deemed that the flood would certainly destroy the Coppers, and that the race would become extinct in that part of the country. The next summer, however, the butterflies were found again on the very same spot, as plentifully as before. Subsequently the tract of land was submitted to the action of fire, and the whole surface burnt with a view to agricultural improvement. After this operation, the Coppers were no longer met with in that particular locality." The latest capture, consisting of five specimens, appears to have been made at Holme Fen, by Mr. Stretton either in 1847 or 1848.

In 1851, Whittlesea Mere was drained, and what was once the home of many a rare bird and insect, became first a dry surface of hardened mud, cracked by the sun's heat into multitudinous fissures, and now scarce yields to any land in England, in the weight of its golden harvest.

In the "Introduction to Entomology" by Kirby and Spence, published in 1826, is the following passage, "Morasses also have their peculiar insects.

In this kind of district in the Isle of Ely, has been taken that scarce and beautiful butterfly *Lycæna virgaureæ*," by a Fellow of Trinity College, Cambridge. Donovan also states one was taken in Cambridgeshire, and *Papilio virgaureæ* and *Papilio hippothoë* (meaning *Dispar*), have been frequently confounded with each other; but on a comparison, a material difference will be discovered. Moses Harris has figured *Phlæas* under the name of *Virgaureæ*, but he was misled by Linnæus, who referred a description of Ray's, to *Virgaureæ* instead of *Phlæas*.

CHRYSOPHANUS HIPPOTHOE.

Purple-edged Copper.

HIPPOTHOE, Linn. Hippo'thoë, the mother of Taphius, of the race of Perseus.

There has existed a certain amount of confusion, concerning the name of the present species. Fabricius thinking Linnæus' description applied to *Dispar*, named the present species *Chryseis*. But the specimen in the Linnæan cabinet is not *Dispar*, but the *Chryseis* of Fabricius.

In the "Pinax rerum Naturalium Britannicarum" of Dr. Christopher Merrett, published at London in 1667, is the following description of a butterfly, "Cum externis coccineis externis purpurascentibus." Mr. Haworth observes in his "Review of Entomology" published in the "Transactions of the Entomological Society" for 1812, "That Merrett should have been acquainted with *Papilio chryseis*, the Purple-edged Copper as British is indeed singular, but his words 'externis purpurascentibus,' by which I understood 'externis marginibus,' &c., absolutely and pointedly agree with it, and as absolutely and pointedly disagree with every other known British species."

The next account of it we have is in "Sowerby's British Miscellany, published in 1806, as follows, "This new British *Papilio* was caught by Mr. Plasted, of Chelsea, in Ashdown Forest, Sussex."

It may perhaps be asked, What other species did Mr. Plasted take? Why! *Satyrus hero* and *arcanius*, in Ashdown Forest; *Acontia catena*, at Brixton; and *Acontia caloris*, in the neighbourhood of London.

In his "British Entomology" Curtis wrote, "*Chryseis* was abundant in August and September, 1818, at Woodside, near Epping."

In his "Illustrations of British Entomology" Stephens wrote, "Dr. Leach received fine and recent specimens from the vicinity of Epping, for several successive seasons." Probably they were from the same person, supposed to be a dealer, who is said to have taken *Calophasia linariæ* in June, 1817, at Woodside, near Epping.

It is a common species throughout a great part of Europe and Western Asia, from June to August, though somewhat local, frequenting damp meadows near woods, and in the mountains.

CHRYSOPHANUS PHLŒAS.

Small Copper.

PHLŒAS, Linn. Phlœ'as, a surname of Venus, perhaps derived from *flos* bloom.

The sexes of this lively little representative of the genus resemble each other closely, and also the female of *Dispar* on the upperside, the hind-wings however, are much blacker, and there are three lilac dots on each. On the underside, the hind-wings are of an ashy brown. The expanse varies from eleven lines to one inch and four lines.

It is a very variable species, and the ground colour varies from the bright copper of the type through paler yellow to perfectly pure silvery white, which variety is called *Schmidtii*. In the other direction, it varies by the fore-wing being suffused with dark scales until they nearly resemble the hind-wings. Mr. Stephens in his "Illustrations" give the following varieties.

Var. *b.* has the fore-wings of a deep dusky copper, with very large nearly confluent spots; the hind-wings with a very narrow waved band.

Var. *c.* has the forewings of a pale rufous copper, with the spots very small, and several of the inner ones obliterated.

Var. *d.* has the hindwings more or less spotted with blue towards the coppery band.

Var. *e.* has the hind-wings with faint radiating coppery lines, as in the female of *Dispar*.

Var. *f.* has the hind-wings wholly of a dusky colour, without the cupreus marginal fascia.

Var. *g.* has the disc of the wings pure white; but the wings are spotted and bordered as in the type.

The Southern variety *Tineus*, Cranes, is very much darker than the type, and has short tails to the hind-wings.

Other named varieties are *Chinensis*, occurring at Shanghai; *Pseudophlœas*, from Abyssinia; *Americana*, from Massachusets, and *Hypophlœas*, from California.

The egg is large for the size of the butterfly. It is circular, rather flattened, of a light cream colour, and very coarsely reticulated with whitish raised net work.—Buckler.

The caterpillar is green, and has a deep red dorsal stripe and a pale red mark along the side, where it projects over the legs. Sometimes it is paler and without the red markings. It feeds on various species of dock and sorrel (*Rumex*.)

The chrysalis is of a light brown, very much freckled with darker brown. It is very thick and dumpy, much resembling that of *Lycæna*.

There appears to be three broods of this resplendent little butterfly in the year. It appears first on the wing in April or May; the eggs then deposited hatch in about ten days, and the caterpillars feed up in about three weeks; they remain ten or twelve days in the chrysalis state, and the butterfly is on the wing again by the end of June. The same relative periods may be taken with the third brood, the butterflies of which appear in September, and continue on the wing sometimes as late as the 8th of November, flashing about in the sunshine, or settling on the yellow flowers of the Inula or Ragwort, or on the lilac blossoms of the Scabious, whose soft tones set off to the best advantage the metallic effulgence of this little gem. The caterpillars from this last brood hibernate when small, and reappear early the following spring.

Phlæas has a very extensive range, and is abundant throughout Europe, except the extreme North, in North Africa from the Canary Islands to Abyssinia, Northern and Western Asia to the Himalayas, and even over the greater part of North America, one form of it extending as far South as Venezuela.

It is also an abundant species throughout the British Isles, except the extreme North.

It is described in Ray's "Historia Insectorum," 1710.

GENUS X. POLYOMMATUS.

Latreille.

POLYOM'MATUS, many eyed, in allusion to the numerous eye-like spots on the under surface of the wings.

This is a very large genus, embracing between three and four hundred species, distributed all over the world, but least numerous in South America. One species, *Parrhasioides*, is as yet the only butterfly known from the Galapagos Islands, and another, *Franklinii*, is found high up in the Arctic Regions. One species, *Trochilius*, is the smallest of our European butterflies, measuring not more than half-an-inch across the wings. Small as all the European Blues are, few of the tropical ones surpass them in size or in beauty; and the largest known species, *Pyreri*, a native of Japan, is not more than a couple of inches across the wings, being thus only slightly larger than our

English species *Arion*: About 50 species inhabit Europe, of which ten have been taken in Britain.

The characters of the genus may be thus described: Antennæ slender, club thick, not gradually formed like that of *Thecla*; palpi rather long; eyes sometimes hairy, sometimes naked; wings very seldom with tails, those of the male generally blue; those of female generally brown.

The caterpillars of all our British species, with the exception of *Argiolus*, feed on papilionaceous, and various other low plants.

Dr. Horsfield in the "Lepidoptera Javanica," divided the genus *Polyommatus* into two sub-genera, the first named *Pithecops*, from the peculiar aspect of the chrysalis. This sub-genus is represented in the British Fauna by *T. alsus*. The sub-genus *Polyommatus*, is characterised by Dr. Horsfield as having the margins of the hind-wings with the anal extremity angular, and produced to a short, rounded point. Mr. Stephens, in his catalogue, adopts these two sub-genera as sections, giving *Argiolus* and *Acis*, as well as *Alsus*, as belonging to *Pithecops*. Dr. Horsfield, however, gives *Alsus* expressly as the European type of *Pithecops*, which he characterises by the comparative narrowness of the wings, and it also possesses a peculiarity in the arrangement of the veins of the fore-wings. *Argiolus*, on the contrary, has broader wings than any other European species, and of a stronger texture. Ochseneimer divided the genus artificially into two sections, according to the presence or want of a row of fulvous spots within the hind-margin of the hind-wings.

A few species have pale transverse lines on the underside; these and one or two others, have short and slender tails to the hind-wings. These Hübner placed in his genus *Lampides*.

SUB-GENUS—LAMPIDES.

Hübner.

Hind-wings with short and slender tails.

Most of the species of this sub-genus are found in Asia and the Asiatic Islands, and only four in Europe.

POLYOMMATUS BÆTICUS.

Long-tailed Blue.

BÆTICUS, Linn. Bæ'ticus, from Bætica, as the Southern portion of Spain was called in the days of the Roman Empire.

This little stranger somewhat resembles the Common Blue on the upperside, but may at once be recognized by the long, tail-like appendages to the hind-wings. The underside is totally distinct from that of any of our native Blues, being of a plain brown with numerous nearly straight white streaks, and two spots of glittering metallic green, reminding one on a small scale, of the "eye" of a peacock's feather. On the upperside the male is of a violet blue, with two black spots at the anal angle of the hind-wings; but the female is blue only at the base of the fore-wings, and the inner margin of the hind-wings, the prevailing colour being brown.

The expansion of the wings varies from one inch and a line to an inch and four lines.

The caterpillar feeds on the common pea, and other of the Leguminosæ in June and July, but has not yet been detected in Britain. It is of a green or of a reddish-brown colour, with a dark dorsal streak, and has a lateral line and oblique streaks, of a paler shade than the ground colour.

The chrysalis is attached by a belt of silk round the middle of its body to the stem of its food plant. It is obese and rounded at both extremities; the colour is testaceous yellow or dull red, with brown dots and black spiracles.

The butterfly is on the wing from August to October. It has long been known as a Southern species, with a very wide range of distribution, abounding everywhere in Europe south of the Alps, and all over Africa, Western Asia and the East Indies. It is also found in the Mauritius and the Canary Islands, and in the Island of St. Helena it is the commonest butterfly, being especially fond of a rather high altitude. On the other hand it is scarcely ever found north of the Alps, except in France; though it occasionally extends its range as far as the Channel Islands, where it appeared abundantly in 1859, and has even been met with once or twice on the South coast of England, and three times in Belgium.

It was first taken in this country in the above mentioned year, 1859; one specimen on the 4th August, near Christchurch, Hampshire, by Mr. Latour. Another on the same day at Brighton, by Mr. McArthur, on the downs near the sea, where a third specimen was taken the next day by the same collector. The next specimen was taken at Freshwater, in the Isle of Wight, by Mr. Snell, on the 23rd of August, 1878.

In 1880, Mr. Durham writes to the "Entomologist" "On September 12th, while at Aldwich, near Bognor, Sussex, I went into the garden, shortly after breakfast. I almost immediately saw a specimen of this rare butterfly at rest on a geranium. Having obtained my net, I succeeded in taking it."

In 1882, a specimen was taken at Bournemouth by Miss Staples, on the 2nd October.

POLYOMMATUS ARGIADES.

Bloxworth Blue.

ARGIADES, Pall. Argia'des, perhaps from Argia, wife of Polynices, daughter of Adrastus, King of Argos.

The wings of this—the most recent addition to our by no means large list of British Butterflies, expand a little over an inch. It somewhat resembles *Ægon*, but may be recognized by the little tail-like appendages to the hind-wings. On the upperside, the male is of a lilac blue, with narrow brown borders to all the wings. The female is brown, and has two orange spots at the anal angle of the hind-wings. The underside is of a whitish grey, with a few black spots and two orange spots at the anal angle of the hind-wings.

The caterpillar is of a pale green, with a dark line along the back, and brown and white spots. It feeds on *Lotus corniculatus*, and various species of *Trifolium*, hibernating small and feeding up in the spring.

The discovery of a new butterfly in Britain is an event of considerable interest. Mr. Stainton in 1857, considered that new species of British butterflies were more likely to occur in the genus *Erebia*, than in any other. Events have proved him wrong. As far as we know at the present time, only five specimens of *Argiades* have been taken in England; two by the Rev. O. P. Cambridge, or rather by his sons. These were taken on Bloxworth Heath, near Wareham, in Dorsetshire, on the 19th and 20th of August, 1885. A specimen was also taken near Bournemouth, the same month by Mr. Philip Tudor. Two others have been detected by the Rev. J. S. St. John, of Whatley Rectory, Frome, Somersetshire. These, it appears, were taken eleven years ago, 1874, close by a small quarry not two miles from the Rectory. As it has a co-extensive range with *Adonis* and *Corydon* on the Continent, it is probable that it occupies other exceedingly small holdings in our South-Western counties, than those to which reference has been made.

Abroad it appears to be, generally speaking, a common species, frequenting open flowery places in woods, and mountain meadows in May, and again in August. The spring brood, *Polysperchon*, is much smaller than the summer, and there is a variety, *Corelas*, which has no orange spots.

It is found throughout Central and Southern Europe, except Spain, North-Western Asia, the South of Siberia, and Amurland.

SUB-GENUS—NOMIADES.

Hubner.

The species of this sub-genus differ from the next by the absence of any red or fulvous spots on the underside.

In Britain we possess four species, one of which, *Alsus*, belongs to the sub-genus *Pithecopis*, of Dr. Horsfield.

POLYOMMATUS ARGIOLUS.

Azure Blue.

ARGIOLUS, Linn. Argi'olus, diminutive of Argos, a city of Greece.

This Blue has wings of a stronger texture than any other of the European species, and is of entirely different habits, flying over the tops of, and settling on, holly bushes, evergreen oaks, and ivy covered walls and trees, instead of low growing plants, in meadows and on chalk downs.

The male is of a pale blue on the upperside, slightly margined with black. The spring brood of the female much resembles the male, but it has a broad black hind-margin to the fore-wings, and black marginal dots on the hind-wings. The summer brood has the hind-margins of the fore-wings still broader; and the costa of the hind-wings also is broadly black. The underside is of a very silvery blue, with numerous black dots. The width across the wings varies from one inch to one inch and a quarter.

In Persia and the Island of Cyprus a variety, *Hypoleuca*, occurs, which has no spots on the underside.

There are two broods of the butterfly in the year. The first is on the wing the middle of April, to the middle of May; sometimes earlier, as the Rev. W. Bree in "Loudon's Magazine" for 1831, mentions having seen it on the wing as early as March 28th. The caterpillars from this are hatched from the egg in the end of May, and feed on the flowers and young leaves of holly, or young ivy leaves throughout the month of June.

The second brood of butterflies appear in the end of July and in August. The second brood of caterpillars feed in September and October, on the flower buds and young leaves of the ivy; and the winter is passed in the chrysalis state.

The egg is very much like that of the Common Blue, except that it is rather larger, the shell is of a pale bluish green, and its whole surface, with the exception of a central spot, is overlaid with raised white reticulations, having little knobs at the angles.

The caterpillar escapes from it by eating a hole near the centre of the upper surface, and is plump and hairy, with a greenish-white body and dark head; it is very slow in its movements. In about five weeks it is full-fed, and then reaches the length of three-eighths of an inch, covered with unusually long, whitish, soft, silky hair. There appear to be several varieties in colour. One is of a bright yellowish-green, with paler lines; another is of an olive green, strongly marked with crimson on the dorsal region, and along the sides; another is of a dark dull satiny green, with a dark green line along the back; another is of an olivaceous pink or mouse colour. It feeds on the flower buds and young leaves of the holly, ivy, evergreen oak, dogwood, spindle tree, and buckthorn. About four or five days before changing to the chrysalis state, it spins a fine layer of silk as a foothold, and fastens itself to a stalk of its food-plant, by a stout thread of silk round the middle of the body, and two short ones on each side, joining which it forms triple moorings.—Buckler.

The chrysalis is short and obese, smooth, of a green or pale ochreous colour, with brown markings, and a dark dorsal line.

Argiolus is a common but seldom abundant species, in open woods and gardens, throughout Europe except the extreme North, Northern and Western Asia, and North Africa; and very closely allied species are found in the Himalayas and North America.

It is generally distributed throughout England and Ireland, but is apparently absent from Scotland and the Isle of Man.

Ray, in his "Historia Insectorum," published in 1710, gives it as having taken by Petiver in a garden at Enfield. This appears to be the first account of it being taken in England.

Lewin writes in 1795, "They are inhabitants of our woodlands, but are far from being numerous. Flying slowly up and down the avenues of the woods they may be easily taken."

In 1809 and 1810, my father met with it in great plenty at Enborne in Berkshire, during the months of May and June.

In 1835 and 1836, it was very abundant in Suffolk, but in 1841 only a couple were seen.

In 1856, immense quantities were taken in Sutton Park, Warwickshire.

In 1870, several were seen in Dorsetshire, previously only one had been seen at Glanvilles Wootton, and that on the 28th of April, 1827.

In 1882, *Argiolus* was again very common.

In the "Entomologist" for 1886, Mr. Harwood of Colchester writes, "I collected for years in this district without meeting with a single specimen;

it then became common for several seasons, but has been comparatively scarce during the past three or four years."

Although *Argiolus* is double-brooded in the South of England, it appears to be only single-brooded in the North, as in his "Lepidoptera of Northumberland and Durham" Mr. Wailes only records it as occurring in the spring of the year; and the Rev. W. T. Bree writing to "Loudon's Magazine for 1836, states, that he took a specimen on the 28th of August, in his garden at Allesley, near Coventry, in Warwickshire, and that, although the species is for the most part only single-brooded in his part of the country, it it does nevertheless, occasionally, though rarely, produce a second brood during the same season.

POLYOMMATUS ACIS.

Mazarine Blue.

ACIS, W. V. A'cis a young Prince of Sicily, who was in love with the beautiful Galathea, and in despair threw himself into the river, which from that time has borne his name. This species appears to have had the name of *Semiargus* given to it in "Des Naturforscher" a Zoological Miscellany, published at Halle, in 1775. The name of *Acis* was given in the Vienna Catalogue, published in 1776.

Lewin, however, in 1795, called it *Cimon*, giving Linnæus as an authority for the name.

The male is of a dull dark blue, with very narrow blackish-brown hind margin to the wings.

The female is of a dark brown, with a bluish tinge at the base of the wings. The under-side of both sexes are similar, being of a pale greyish-drab, tinged at the base with greenish-blue, and with black spots in white rings.

The width across the wings varies from one inch to one inch and a half.

Five named varieties occur on the mountains of Asia Minor, Mount Parnassus and other Greek mountains. One of them, *Belbi*, has red spots on the underside, and another, *Antiochena*, a form of the female, has a reddish band on the upperside of all the wings.

When flying, *Acis* much resembles *Alexis*, but is darker in colour, of slower flight, and flies more heavily, and at Glanvilles Wootton was formerly the most common.

The caterpillar has never been discovered in England. It is covered with fine yellowish-green hair, and has stripes of a darker shade on the back and sides; the head and feet being of a dark brown. It feeds on *Anthyllis vulneraria* in August and September. (Kirby.)

The butterfly is found from May to August, and inhabits meadows throughout Europe except the extreme North, and its range extends into the Western parts of Asia, as far as Persia.

It has never been met with in Scotland, Ireland, the Isle of Man or the Channel Islands, and in England is an almost, if not quite, extinct species.

The first account we have of its occurrence in England, is in Ray's "Historia Insectorum" published in 1710, as follows. "Alæ supinæ ad exortum cœrulescunt; inferius e fusco albicant. Ocelli sex septemne in singulis alis. A. D. Dale capta nobisque ostensa est."

In 1795, Lewin in his "Insects of Great Britain" writes, "This is a very rare butterfly with us, and therefore it will be readily supposed our knowledge of its natural history is very much confined. The caterpillar is unknown. The last week in August, 1793, I took two or three of the butterflies, flying in a pasture field at the bottom of a hill near Bath. They were much wasted in colour and appeared to have been long on the wing; whence we may safely conclude, that they were first out from the chrysalides about the middle of July."

In 1803, Haworth in his "Lepidoptera Britannica" writes, "Habitat Imago m. Mai. f. Jul. in Cretaceis, rarissima fere omnium nostratum cœruleorum; at nuper capta, et ad me missa, in comitatu Ebor, amicissimo meo P. W. Watson, et etiam in Norfolcia amicissimo meo J. Burrell, M.A."

In 1819, Samouelle in his "Entomologists' Useful Compendium" writes, "In Britain it is very local, but it is found near Sherborne in Dorset in great abundance."

In 1828, Stephens in his "Illustrations of British Entomology" writes, "A scarce, or rather local species; found in chalky districts in Norfolk, Cambridge, Yorkshire, and Dorsetshire; also near Brokenhurst and Avesbury, Hants; and on Windlesham Heath, Surrey, towards the end of May and of July." To these localities, Curtis adds Leicestershire, and Coleshill, Warwickshire, and it has also been met with in Lincolnshire, Worcestershire and Monmouthshire.

In Loudon's Magazine for 1833, the Rev. W. T. Bree writes, "*Acis* was at one time considered to be an insect of very great variety. In 1803, Haworth spoke of it as the rarest, perhaps, of our British Blues. Since that period, the species has turned up in a variety of situations. Though by no means common, it appears to be widely distributed; nor is it peculiar to chalk districts; but seems to delight in woody situations abounding in grass. Probably it may be overlooked on the wing, and passed by for the Common Blue."

It was common at Glanvilles Wootton, in Dorsetshire, in 1808, once recorded in 1811, once in 1812, common in 1813, 1814, 1815 (one being taken as late as August 1st), and 1816, scarce in 1817 and 1818, common in 1819, 1820, and 1821, scarce in 1822 and 1823, common in 1825 twenty specimens being taken by my father on the 13th June, scarce in 1828, 1830, and 1831, common in 1834 and 1835, one only seen in 1836, a few in 1837, none recorded in 1838, scarce in 1839 and 1840, and in 1841 a pair on the 19th June, being the last ever seen in Dorsetshire. From J. C. Dale's Entomological Journal.

In Cambridgeshire, the last specimen appears to have been taken on 28th July, 1858, and in Gloucestershire, July, 1849. In Glamorganshire, it could be taken in plenty in 1835, 1836, and 1837; a few were also taken in that county in 1871, 1874, and 1875, twelve specimens in 1876, and two in 1877. At Tenby, in Pembrokeshire, one was taken by Mr. Edwards, flying over thyme, in 1883. This appears to be the last specimen taken in the British Isles.

POLYOMMATUS ALSUS.

Little Blue.

ALSUS, W.V. Al'sus, a Rutulian shepherd, Virg. *Æneid.* xii. 304.

This was named *Minima* by Fuessli in 1775, but Fabricius recognizing the absurdity of the name, adopted that of *Alsus*, given in the Vienna Catalogue, published in 1776. *Trochilius*, not *Alsus*, is the smallest of the European butterflies.

Both sexes are of a dull brown on the upperside, the male with, the female without, a silvery blue tinge. The underside much resembles that of *Acis*.

The width across the wings varies from three-quarters of an inch to an inch.

Very few varieties are known. I once saw an albino taken at Winchester, and a variety, *Lorquini*, which is sky blue on the upperside, is found on the Continent.

The egg, as might be expected, is very small, round, but more flat than globular, with a central depression on the upper surface; the depression is the only place where the pale green ground colour of the egg can be well seen, because the rest of it is closely covered with a raised white network. It is generally deposited low down on the calyx of the flowers of *Anthyllis vulneraria*; on the flowers and seeds of which plant the caterpillar feeds.

The caterpillar is a very tiny little fellow on emerging from the egg, and is of a whitish-green colour with a black head. After a time the colour changes

to a pinkish-brown or a chocolate, and finally to a greenish-yellow, with reddish-brown dorsal and lateral streaks, the skin being covered with short bristles of a darkish brown. When full grown it is about one-third of an inch long, and may be compared to a very tiny tortoise, the head being very small and retractile, and a lateral ridge running all round, and giving the appearance of an upper shell.

The chrysalis is obese, of a brownish-yellow with three rows of black spots. It does not appear to be suspended by the tail and by a girdle of silk, as is the custom of the family, and when found on a chalky soil, can well be passed over as a stony particle.

There appears to be two broods of the butterfly in the year, at least in the South of England, one in May and June, and the others in August. Perhaps the second brood does not always appear, as the Rev. J. Hellins writes to the "Entomological Monthly Magazine," Vol. 10. thus, "Egg laid about middle of June; caterpillar hatched within a week, full-fed, and fixed motionless about the end of July, so continuing ten months till the beginning of next June; the chrysalis state then lasting some ten days or so, and the butterfly, apparently, living but a short time to perpetuate the species. The long continuance in the caterpillar state, after being full-fed, seems very remarkable."

This little butterfly is generally distributed over Europe except in the extreme North, and occurs also in Siberia and Asia Minor. It is chiefly confined to chalk and limestone districts, and rather local though occurring in almost every county in England, and is common in many places in both Ireland and Scotland, Forres being its northernmost limit.

Lewin appears to have been the first to have taken it in England, for in his "Insects of Great Britain," 1795, he writes thus, "This very small butterfly passed unnoticed a number of years. Its flight is quick, and being so very minute, it is lost to the sight in a moment. It is far from uncommon, as I have taken it in various places flying the first week in June. It frequents the sides of hedges on a chalky soil. The caterpillar is not likely to be seen, as it must be very small; and we may safely suppose, that it feeds on grass. The male and female differ only in size."

Stephens in 1828, records it as "not a very abundant species."

POLYOMMATUS ARION.

Large Blue.

ARION, Linn. Ari'on, a Lyric poet of the Island of Lesbos, and a skilful player upon the lute.

The upperside is of a deep dark blue, with black hind-margins, and granulated with black scales, giving it a dull appearance. There is a black central spot on the fore-wing, and four spots or more between it and the hind-margin. The female differs from the male by having the spots of a larger size, and wedge shape, instead of being round as are those of the male. The underside is of silvery gray with a blue tinge near the base of the wings, and has many black spots in white rings.

The expansion of the wings varies from one inch and five lines, to one inch and eight lines.

Var. *b.* (*Alcon*, Steph.) is of a brownish ash colour on the underside, and has the spots rather indistinct. Stephens records it as being in the collection of Mr. Haworth, and that it was captured in Buckinghamshire, by Mr. Jones, known by his paper on the neuration of the wings of the Linnæan *Papilions*. After Mr. Haworth's death, it was bought at the sale of his effects, by Mr. Dale. Other examples exist in various other collections.

Another variety, *Cyanecula*, occurs in North-Eastern Siberia.

The egg is round, smooth, and depressed on the top, and of a pale greenish-blue colour. It is covered with fine raised transparent white reticulation.

The caterpillar is a stout little fellow, but tapering towards the head. At first it is of a dull green colour, but afterwards turns to a pinkish-brown, the body being sparingly clothed with light brown hair. When young it feeds on the flowers of *Thymus serpyllum*, but in captivity always dies before changing to a chrysalis.

Arion is generally distributed over Europe, and the North and West of Asia. In Germany it haunts the lofty fir forests, where the ground is clothed with bilberry, moss, and straggling plants of wild thyme, and is to be met with throughout the month of July. In Silesia, though, Professor Zeller found it plentifully in the moist open meadows at the foot of Mount Hochwald. It has never been met with in Ireland, Scotland, or the Isle of Man, and in very few counties in England.

Donovan in his "Natural History of British Insects," published in 1796, writes, "*Papilio arion* is a very scarce insect in this country, and it does not appear to be much more common in any other part of Europe, as Fabricius only says "Habitat in Europæ Pratis. Mr. Lemon, a collector of eminence some years since, met with it in England."

British specimens of *Arion* belonged to the celebrated Duchess of Portland, and after her death, were sold at the sale of her Museum, in 1786.

In his "History of British Insects," 1795, Lewin writes, "This species of butterfly is but rarely met with in England. It is out on the wing the middle of July, on high chalky lands in different parts of the kingdom,

having been taken on Dover Cliffs, Marlborough Downs, the hills near Bath, and near Cliefden in Buckinghamshire.”

Mr. Haworth received this local species from Dr. Abbott, who took it in 1798, in the Mouse's Pasture, near Bedford, where Mr. Dale afterwards took it in 1819.

It was also formerly taken on hills near Winchester, at Monk's Wood in Huntingdonshire, near Hereford, and at Charmouth, in Dorsetshire. Its metropolis appears to have been in South Devon, at the Bolt's Head, near Plymouth. It has also been met in some abundance at Clonelly, in North Devon, at Langport, in Somersetshire, and on the Cotswold Hills in Gloucestershire. From Gloucestershire we ascend to a Midland county, Northamptonshire, in which county a considerable number have been taken at Barnwell Wold, where it was discovered by the Rev. W. T. Bree, in July, 1837.

During the last five and twenty years, this fine species of Blue has been gradually disappearing from its known localities in this country. It was certainly extinct at Barnwell Wold, in 1865, and it has rarely, if ever, been seen in the Wold since the wet summer of 1860.

The following passage is extracted from a communication made to the "Entomologists' Monthly Magazine" for 1885, by Mr. Herbert Marsden:—
 "It was on June 17th, 1866, that I first saw the species alive, when in the course of a long ramble I captured it in a narrow valley amongst the Cotswold Hills. The early part of June, 1867, was dark and cold, and I only secured some twelve or fifteen examples. The season, May and June, 1868, was hot and brilliant, and *Arion* appeared on June 5th, which is the earliest date I ever heard of the species being out; but although rather more plentiful than the previous year, it was still rather scarce. In 1869, another fine or partially fine season, it was more abundant, and I find from my diary that on June 19th I took ten at rest about sunset. The year 1870, however, is the one to be marked with a white stone by the lovers of *Lycænidæ*; and *Arion* appeared much more widely distributed than in any other year I know of, either before or since. It would, I am sure, have been possible for an active collector to have caught a thousand specimens during the season, for in a few visits I secured about an hundred and fifty, not netting half of those seen, and turning many loose again. During the next few years *Arion* continued to appear, but very irregularly as regards numbers. The best seasons since 1870 being those of 1876 and 1877, the latter especially, but on no occasion has it been nearly so abundant as in 1870. Now come the dark days. The latter part of June, 1877, was damp and broken, not at all the bright warm weather which *Arion* loves. In dark, cloudy weather they are always

still, and, I believe, they will only deposit their eggs when the sun is warm and bright. In 1878 the weather was worse, there being hardly a fine day in the month, and less than a dozen were seen, mostly worn and weather-beaten, for there was scarcely two consecutive fine days. In 1879 the weather was still worse, and *Arion* scarcer than ever, while in 1880 only two were obtained and two three more seen. For the four years 1881-4, not one has been seen in the Gloucestershire district that I have been able to trace."

In the "Entomologist" for 1884, Mr. Bignell writes, "I feel quite certain that the haunts of *Lycæna arion* at Bolthead must be looked upon as a thing of the past. I visited the old familiar spots twice this year, 28th June and 5th July, without seeing a single specimen. On the 17th June, 1865, when I captured the above named species, the wild thyme was in full bloom. Many females I watched that day, flitting about depositing their eggs on the flowers of the thyme. But now all is changed, the fern, furze, and thyme, which held full possession of the slopes towards the sea are comparatively gone. The farmer who rents the land has annually burnt, first one spot and then another. I know *Arion* has been on the wing this year, for I have had the pleasure of seeing nine specimens, taken during the first week in July by a gentleman who had visited Bolthead, but gave it up in disgust. Although the eggs are laid on the flowers of the thyme, and the caterpillars feed upon them until the first moult, it is quite certain that it is not their food-plant; but what the food-plant is I am not prepared to say, but I strongly suspect it is one of the small *trefoils* or *vetches*."

The above mentioned nine specimens are the last that have been recorded as being taken in England, and were probably taken on a rough piece of ground near a village about ten miles from Kingsbridge, in South Devon, where Newman in his "British Butterflies" published in 1871, records it as being very abundant.

SUB-GENUS—AGRIADES.

Hübner.

All the species of this sub-genus or section possess a row of red or fulvous spots on the under surface of all the wings, near the hind margin.

The females bear a close resemblance to each other; indeed, Mr. Stainton in his "Manual" observes of two of the species, *Corydon* and *Adonis*, "The first real difficulty of the butterfly collector consists in the discrimination of the females of these species; the males can always be readily distinguished by the great difference in the ground colour of the upper surface of the wings.

Adonis well deserves its name, and is the most splendid Blue we have. *Corydon*, however, has a peculiar beauty of its own, it reminds one of the soft silvery appearance of moonlight, whilst *Adonis* recalls the intense blue of the sky on a hot summer's day. These gay colours are confined to the males, the females are clothed in sober garbs of brown. *Corydon* boasts of a more or less distinct spot on the upper surface of the hind-wings, this in *Adonis* we seek for in vain; and, besides, in *Corydon* we find the dark dashes in the white fringes broader and more conspicuous than in *Adonis*. A fainter point of distinction is, that the black spots of the underside are more conspicuous in *Corydon* than in *Adonis*." *Corydon* has, moreover, a more striking appearance than *Adonis*, and is normally the larger insect of two. The scales, again, with which each is sprinkled, are of the same tint as the respective males.

POLYMMATUS CORYDON.

Chalk Hill Blue.

CORYDON, Poda. Cor'ydon, a Roman shepherd. Virg. Ecl. ii. 56.

This species varies in the expansion of its wings from an inch and a line to an inch and three-quarters.

The male has the upper surface of the wings of a very light silvery blue with dusky hind-margins, which near the anal angle of the hind-margins are broken up into three or four spots. The female is brown, sprinkled with scales of the male colour, and has a row of fulvous spots round the hind-margin, most distinct on the hind-wings, which have also a less distinct central spot. Both sexes have white fringes, through which the wing rays form dark lines; these lines are broader and more conspicuous than are those of *Adonis*. The underside is of a brownish-grey or slate colour with distinct black spots in white rings, these spots are larger than those of *Adonis*, and give a bolder and a more striking appearance. A row of these spots round the hind-margin has an orange lunule to each, on the side nearest the base, forming a wavy orange line.

Many remarkable varieties of this species exist, especially on the underside. Stephens in his "Illustrations" gives the following:—

Var. *b*. Above brown, with a blue disc, and a whitish discoidal dot with a black pupil: beneath, the posterior wings have a discoidal white-cinctured crescent, with a wavy band of seven undulated spots towards the hinder margin. This is the *Calæthys* of Miss Jermyn.

Var. *c*. Male with the hinder-margins of all the wings above with a very deep blackish fimbria; the ocelli on the posterior wings very strong.

Var. *d.* with the humeral spots beneath the anterior wings obliterated.

Var. *e.* all the wings beneath with the central discoidal spot alone; the margins with faint rudiments of ocelli.

Var. *f.* with the spots more or less confluent beneath, sometimes prolonged into dashes; the colour of the upper surface of the wings in both sexes varies much; the female has been found with the disc fine rich blue.

There are a great many named varieties:—

Var. *Albicans*, H.S., as its name implies, is a white form found in Andalusia.

Var. *Appenina*, Zell., is a very pale form found on the Italian mountains.

Var. *Hispana*, H.S., or *Arragonensis*, Gerh., is another pale form, with spotted hind-margin, found in Spain.

Var. *Corydonius*, H.S., or *Ossmar*, Bis., is a violet-blue form, found on the mountains of Asia Minor.

Var. *Caucasica*, Led., is a sky-blue form, from Armenia.

Var. *Syngrapha*, Kef. is a form of the female which resembles the male, except that there is a brownish band of orange rings or lunules round the hind-margin of all the wings. It occurs chiefly on the Swiss Alps, but I have a specimen taken in the South of England, and it has also been met with at Frankfort.

Var. *Calathæis*, Jermyn, has a discoidal white-cinctured crescent on the underside of the hind wings, below which, towards the posterior margin, is an undulated band consisting of seven ocellated spots; the forewings sometimes have a central spot and sometimes more. I have both male and female of the variety, and also a specimen with only a central spot on the underside of one of the forewings and several on the other.

Var. *Cinnus*, Hubner, closely resembles the last, but the hind wings are of a much darker brown, and the fore wings have seven black spots in white rings on the underside.

Var. *Parisiensis*, Gerh., closely resembles the type with the exception of a white streak on the underside of the hind wings.

Besides these there are other remarkable varieties. Mr. Welman has a female taken at Croydon, with a small patch of the male colour on the fore wings, and a larger patch on the hind wings; and I have one which is chalky white on the underside, and has only one black spot, and that in the centre of each fore wing.

The caterpillar is very similar to that of *Adonis*, but is of a lighter and and brighter green, and the hairs it is covered with are of a light brown. In every other particular of form and ornamentation the two agree. It feeds on *Hippocrepis comosa*, *Anthyllis vulneraria* and other allied plants.

In the description of *Papilio Machaon*, it will be remembered that a distinguishing mark of the caterpillar, is a reddish coloured forked appendage just behind its head, which, when the creature is alarmed, gives out a strongly scented fluid. According to Dr. Hagen, a somewhat similar process exists on the caterpillar of *Corydon* and its allies, but this seems attractive rather than protective. Dr. Hagen writes, "You find on the penultimate segment outside and behind the stigmata, two large white spots, each one of which originates a white membranous tube, just like the finger of a glove, the top of which is not entirely drawn out. On the ante-penultimate segment is a large and transverse opening behind and between the stigmata, near the apical border. It looks like a closed mouth with lips, but I have not seen anything protruding from it. These were first, I believe, discovered by Guenèe, and the fact that ants hunted the caterpillars, and followed them for the sake of the secretion was first remarked by Professor Zeller. This ant companionship is detailed in a very interesting manner by Mr. Edwards, in his 'Butterflies of North America,' under the head of *Lycæna Pseudo-argiolus*, from which much of the above is quoted."—Extracted from Mr. Jordan's "Review of Buckler's Larvæ of British Butterflies," in *Entomologists' Monthly Magazine*, Vol. 23.

The chrysalis is short and rounded, and of a pale greenish-brown colour.

The butterfly appears on the wing in the middle of July, and continues out to the first week of September. In the wet year of 1879, I met with both it and *Adonis* on the 2nd October, but it must be looked upon in the light of a retarded emergence. The females appear later than the males, and are much less frequent. They lay their eggs in August, and the caterpillars being hatched in September, hibernate small, feed up in the spring, and turn to the chrysalis state in June.

On the Continent it is found generally in the Central and Southern portions of Europe, from Spain to the South of Russia, and it also occurs in the West of Asia. Though called the Chalk Hill Blue, *Corydon* is much more widely distributed in England than *Adonis*. It is most plentiful in the South, but is not uncommon in some places in Lancashire in the West, though it is not found in Yorkshire in the East. It is most plentiful on the chalk and limestone, but is occasionally found elsewhere. It has never been met with in either Scotland, Ireland, or the Isle of Man.

Petiver figured it in 1702, in his "Gazophylaci Naturæ et Artis," and Ray, in his "Historia Insectorum," writes "Hanc in cellibus Banstediensibus prope Epsam invenit D. Petiver; eumden etiam nuperrime observavit D. Dale propè Newport oppidum in Essexia."

POLYOMMATUS ADONIS.

Clifden Blue.

ADONIS, W.V. Ado'nis, a young shepherd beloved by Venus. Virg. Aln. x. 18.

The name of *Adonis* was bestowed in the Vienna Catalogue, published in 1776, and the name of *Bellargus*, in Der Naturforscher, published in 1775.

The former name was adopted by Fabricius, who attempted to combine in some degree Natural and Civil History, by attaching the names of personages illustrious in their day, to the butterflies; thus following the example of the illustrious Linnæus. The only exception Linnæus appears to have made to this rule was in naming a few species after the plants on which their caterpillars feed.

Linnæus is recorded as having said, "If Fabricius comes to me with a certain insect, and Zoega with a certain moss, then I pull off my hat and say, 'Be you my teachers.'" Unfortunately, some entomologists of the present day, following the harsh and stern rule of priority to too great an extent, discard the beautiful name of *Adonis* for that of *Bellargus*. Linnæus laid down a rule in his "Critica et Philosophia," that no adjective should be admitted as a generic name. On this ground he expunged several names of other authors. In a letter to Haller, written on June 8th, 1737, Linnæus says, "Those who come after us, in the free republic of Botany, will never subscribe to authorities sanctioned only by antiquity, why, therefore, should we retain barbarous or mule names, or names distinguished only by their tails? If specific names require alteration, why may not false generic ones likewise be changed?"

The species varies in the expansion of its wings from an inch and a line to an inch and a half.

The male has the upper surface of the wings of a lovely clear bright blue, with a slender black line round the hind margins. The female is brown, sprinkled with scales of the male colour, and has a row of fulvous spots, brighter than those on *Corydon*, round the hind margin, most distinct on the hind-wings. Both sexes have white fringes, through which the wing rays form dark lines. The underside is of a brownish gray or slate colour, with distinct black spots in white rings; these spots are smaller than those on *Corydon*. A row of these spots round the hind margins has an orange lunule to each on the side nearest the base, forming a wavy orange line. The female is slightly smaller than the female of *Corydon*.

Many remarkable varieties of this species exist, especially on the underside. Stephens, in his "Illustrations," gives the following:—

Var. *b*. With the ocelli beneath more or less confluent.

Var. *c*. With the fulvous band on the hinder margin of all the wings obliterated.

Var. *d*. With the humeral spots of the anterior wings beneath obliterated.

Var. *e*. With all the ocellated dots beneath very small, and several of them deficient.

Var. *f*. With the central discoidal spot alone remaining, the marginal fascia merely indicated by a few indistinct dusky lunules.

The varieties in ocellation are endless: some have the ocelli nearly round, others more or less elongate; some very large, others extremely small; the white blotch on the posterior wings beneath, also varies much in size and form.

A few named varieties exist.

Var. *Ceronus*, Esp., is a form of the female which is very much suffused with blue on the hindwings, and the male has a marginal band of fulvous spots on the upper surface of all the wings.

Var. *Urania*, Bischoff, is a form of the male found in Turkey, which is black, suffused with blue; this is perhaps the same as the *Polona* of Zeller, which occurs on the mountains of Asia Minor.

Var. *Cinnus*, Hub., has the spots on the underside of the posterior wings not ocellated. Besides these, there are other remarkable varieties. I have a female of the same colour as the male, thus corresponding to the var. *Syngrapha* of *Corydon*. Mr. Briggs has a female with dashes of the male colour on the tip of one wing, and females are occasionally very much suffused with blue. A very strange variety was taken at Folkestone in September, 1875, being very dark bluish-black on the upperside with a bluish-gray fringe, and shot with coppery reflection on the underside. Mr. Briggs has a female which is almost black on the underside, with the exception of a white central ring on each wing, and the marginal row of fulvous spots; and Mr. Stevens has another which is unusually pale on both the upper and under sides.

The egg of *Adonis* is small, round, and of a light dull grey, with white reticulation and knobs.

The Caterpillar is very similar to that of *Corydon*, but is of a deeper and darker green, the hairs it is covered with are black. There is a double dorsal row of eight humps or segments. The side spreads out to a rounded ridge running round the body, and hiding the legs from view when the caterpillar is at rest.

The chrysalis is obese, with some very small hairs scattered over it. The colour is at first greenish on the wing-cases, greenish-brown on the rest of the body, afterwards it is ochreous all over.

The butterfly appears on the wing in May or the beginning of June. The egg is doubtless laid that month, and the caterpillar should be found feeding on *Hippocrepis comosa* (the Tufted Horseshoe Vetch), in June and July.

In August the second brood appears, the caterpillars from which, hibernating when small, feed up the following spring, and enter the chrysalis state in April or the beginning of May.

It is very common in many parts of Europe, North Africa, and Asia Minor. In North-Eastern and North-Western Europe it is much more local than in the South, being especially attached to the chalk and limestone.

It is unknown as an inhabitant of Scotland, Ireland, or the Isle of Man, and in England is a more southern species than *Corydon*, not occurring north of Gloucestershire and Buckinghamshire.

The first account I can find of its occurrence in England is in the "Aurelian's Pocket Companion," by Moses Harris, published in 1775, as being found on commons near Clifden.

Lewin, in his "Insects of Great Britain," 1795, writes, "This most beautiful species of butterfly was first observed and caught at Clifden, in Buckinghamshire, and for that reason has always retained the name of Clifden Blue; however, it is pretty common in various parts of England, and is to be taken on chalky pastures. The flies are on the wing the middle of June; and as they do not fly from the place where they are bred, and frequently settle on the ground, they may be easily taken."

Haworth, in this "Lepidoptera Britannica," 1803, writes, "*Adonis*, being by far the most lovely of the British Blues, is much sought after by our inferior collectors, who make annual and distant pedestrian excursions, for the sole purpose of obtaining its charming males to decorate their pictures with; a picture, consisting of numerous and beautiful lepidoptera, ornamentally and regularly disposed, being the ultimate object of the assiduous people in the science of Entomology. These pictures are of various shapes and sizes: I have even seen some which have contained 500 specimens."

Some of the Spitalfield collectors, after toiling at their weaving machines all the week, used to start at 10 o'clock on Saturday night, in order to arrive at Darenth and Birch Woods by daybreak, so as to collect the twilight-flying moths. Daniel Bryder, one of the most industrious of these collectors, and who was employed by Mr. Wilkin to collect for him in the New Forest, was the first of the Spitalfield collectors who attempted to arrange his insects

scientifically. The feelings of this class of persons Crabbe thus records in his "Borough":—

"There is my friend the weaver; strong desires
Reign in his heart, this beauty he admires.
See to the shady grove he wings his way
And feels in hope, the raptures of the day—
Eager he looks, and soon to glad his eyes
From the sweet bower by nature formed, arise
Bright troops of virgin moths and fresh-born butterflies
—He fears no bailiff's wrath, no baron's blame,
His is untax'd and undisputed game."

POLYOMMATUS DORYLAS.

Dartford Blue.

DORYLAS, W.V. Dórylas, one of the conspirators against Perseus, and slain by him. Ovid Met. V. 130.

In Lewin's "Insects of Great Britain" published in 1875, figures are given of a *Polyommatus* under the name of "*Hyacinthus*," of which he writes "I met this new species of butterfly in the middle of July, flying on the side of a chalk hill near Dartford, in Kent, and have no doubt but there was a constant brood at that place, as I found them there for two successive years on the wing, in the middle of the same month. The male is figured with the wings expanded, at fig. 4; the female at fig. 5; and the under-parts at fig. 6." Ochenheiner refers these figures to Dorylas, W.V. J. F. Stephens in his "Illustrations," doubtfully gives Lewin's insect as distinct from *Adonis*, and in his last publication (the Museum catalogue), it stands as variety "a" of that species. Henry Doubleday in the *Zoologist*, Vol. 21 writes, "I have examined the specimens contained in the cabinet of the late J. F. Stevens. They are certainly not Lewin's species, but merely ordinary specimens of *Adonis*; and the same may be said of the specimens marked '*Ceronus*, Hub.,' which is a variety in which the female is of nearly as brilliant a hue as the male. I do not know whether any of Lewin's specimens are now in existence, but his figures most certainly represent the sexes of *P. Dorylas*, which is distinguished from *Adonis* by its paler blue colour slightly tinged with green, immaculate cilia, and the absence of the two transverse ocelli at the base of the superior wings beneath." The female is of the same colour as the male; but the fore-wings are broadly bordered with black, and the hind-wings have a row of bright fulvous spots round the hind-margin.

The caterpillar is dark green, with yellow streaks and a black head; and lives on the flowers of *Melilotus officinalis* in Spring and Autumn, being

double brooded. It is found in May and August, in many parts of Europe, but is local and not very common, frequenting grassy woods and hills, especially on a limestone soil. It is almost absent from the plains of Northern Germany, and there is no trustworthy record of its occurrence in Britain since the time of Lewin.

POLYOMMATUS ICARUS.

Common Blue.

ICARUS, Rott. *Icàrus*, the son of *Dædalus*, who flying with his father from Crete with artificial wings, flew too high, whereby the sun melted his wings, and he fell into the sea, which from him was called the Icarian Sea.

This species varies in the expansion of the wings from three quarters of an inch to one inch and five lines.

The male has the upper surface of the wings of a lilac blue. The form of the female most frequently met with is brown, much suffused with blue; and has a series of distinct fulvous crescent-shaped spots near the hind-margin of all the wings, forming a wavy line. The fore-wings of the female have a black discoidal spot, and the hind-wings have a marginal row of black spots edged with white on one side, and having the fulvous spots on the other. Both sexes have white fringes, but they are not intersected by the wing rays, as in *Corydon* and *Adonis*. The underside is of a pale grey or pale brown colour with distinct black spots in white rings, and a row of distinct fulvous crescent-shaped spots round the hind-margin.

The varieties of this species are innumerable, both in size, form, and colour, some of the females have the fore-wings very much rounded at the tip, others somewhat acute; the hind-margin of the fore-wings is frequently spotted with white, and the disc sometimes has a round white dot with a central black spot. some specimens are remarkably clear, and so transparent that the ocelli on the underside of the wings are plainly observable on the upper. Some females have the fringe entirely brown, and others quite white; some have the upper surface of the wings nearly as blue as that of the males, with a black central spot; whilst others are plain brown, without the least vestige of blue. The number of ocelli also varies greatly. Specimens occur occasionally that are true hermaphrodites, having the wings on one side male and on the other female. A specimen is in Mr. Gregson's collection which has the fore-wings male, and the hind-wings female. A very extraordinary one has the left side male and the right side female, except that about two-thirds of the inner portion of the fore-wing is of the male colour, leaving a stripe along the costa of the usual colour of the female.

Var. *b.* (*Icarinus* Scriba.) Differs from the type by the absence of the basal spots on the underside of the fore-wings.

Var. *c.* (*Labiensus*, Jermyn.) Wings pale pinkish-blue above, and without the fulvous spots beneath.

Var. *d.* (*Lacon*, Jermyn.) Has the disc of the wings on the underside marked only with a triangular spot; the hind-margin of the anterior with a few indistinct dusky marks, and of the posterior with a fulvous band terminated internally with a series of black wedge-shaped spots, and externally with black dots on a white ground.

Var. *e.* (*Thestylis*, Jermyn.) Is formed of a large specimen of the female, in which the blue of the upper surface is much more extended than in the type. The anterior wings beneath has a large kidney-shaped black spot circled obscurely with white, the concave side turned towards the inner margin; the posterior wings with the spot next the costal margin kidney-shaped, the concave side turned towards the disc.

Var. *f.* The anterior wings have a distinct marginal band of fulvous crescents surmounted with black, and the central spot of the underside of the posterior is obsolete.

Var. *g.* Like the preceding, but in the band on the upperside of the hind-wings, the posterior part of the iris is silvery.

Var. *h.* (*Iphis*, Baumh.) A brown form of the female, without any blue.

Var. *i.* (*Thersites*, Baumh.) A blackish-brown form of the female, with a row of small fulvous spots near the hind-margin of the hind-wings, but none on the fore-wings.

Var. *j.* (*Cærulea*, Gar.) A lilac blue form of the female, with broadly black hind-margin, otherwise like the type. This is probably the *Icarius* of Miss Jermyn, and the *Amandus* of Hubner.

Var. *k.* (*Pusillus*, Gerhard.) Appears to consist of very small blue males and brown females.

Var. *l.* (*Eros*, Steph.) The male above very pale greenish-blue, with a narrow marginal black streak; the posterior wings with a few blackish spots on the margin; on the underside is a faint yellowish band.

In addition to the above there are some very interesting varieties. Violet; blue shot with mauve; and sky-blue males are known; and the underside of a very singular variety, taken near Cambridge, by the Rev. Rudston Read, is figured in the "Entomological Transactions" for 1853. In this specimen the usual ocelli were absent, but on each wing was a row of strong black marks within the posterior margin, not extending outwardly beyond the red spots on the lower wings, and similarly situated on the upper wings, but

there the red spots were wanting. Only part of the posterior ocelli were represented by black dots.

A more extraordinary one still was taken by my father, in Dorsetshire, on August 5th, 1826. The underside of this specimen is of a cream colour, the usual ocelli are absent, but replaced on the fore-wings by two black streaks near the centre, and on the hind-wings by a very few minute black dots; the fulvous band of spots same as in type, but the marginal row of black spots wanting. I have a variety of *Corydon* almost identical with this, given me by Mr. Ross.

The egg is circular, and of a greenish-white colour, covered with tiny hairs; it has a pale line above the projecting sides, and several pale oblique lines on each side, and a small black head; the segmental divisions and a sunk dorsal line are of a darker green. When young, the colour is grey tinged with purple, and it makes its exit from the egg by eating a large round hole in the centre of the upper surface, leaving the rest of the shell untouched. For some days its only method of feeding is by eating into the substance of a leaf of the Bird's-foot trefoil (*Lotus corniculatus*), either from the upper or lower side, leaving the opposite skin as a white spot; afterwards it feeds on the flower as well as on the leaves. The Rest Harrow (*Ononis arvensis*) and clover are also food-plants.

The chrysalis is dull green, with brownish markings, short and stout, nearly as round at the anal extremity as at the head.

The butterfly appears on the wing in May, and soon becomes very plentiful, continuing throughout June in great abundance. The caterpillars from this brood feed up rather quickly, and even by July, the second brood of the butterfly may be taken. Late in the season, September and October, dwarfed specimens are found, which may be a third brood, but this appears to depend very much on circumstances. When the weather is unsuitable, few of the last brood appear, and it is probable that the caterpillars feed up and enter the chrysalis state in the autumn, or hibernate, according to the season; those which hibernate producing the largest specimens of the butterfly. The most northerly specimens are the largest and brightest, and perhaps the reason may be found in the fact of their remaining the longest in the caterpillar state.

This is the commonest of all the Blues, abounding in meadows, on heaths and downs, and not at all confined to chalky soils like its congeners, and occurs all over the British Isles, from the Isle of Hoy, the most northerly of the Shetlands, to the Lizard Point in Cornwall.

It is common all over Europe, Northern and Western Asia, as far as the Himalayas, and North Africa.

The first English author to figure it was old Mouffet, in 1633, in his "Insectorum sine minimorum Animalium Theatrum.."

Besides giving a figure of the upper and another of the underside, he gives the following description, &c.—

"Lætiore adspectu prodit, alis oculatis, cyanum cœlestem atque incomparabilem spirantibus. Fecit illam Dedala rerum artifex natura totam oculeam, adeo ut illum in Mythologo Arctoris filium, non pavonis caudæ infertum, sed in hujus alis habitantem haud inepte fingeres; quas quidem non minori superbia adnerso sale expandit, atque illa avis Junonia, quam, præ celesti quo excellit colore, fere in ruborem dat."

It is also described in the "Pinax," of Dr. Merrett, published in 1667, as follows: "Alis oculatis cyanum cœlestem spirantibus."

It is also figured in Petiver's "Gazophylacii Naturæ and Artis," in 1702, under the name of "*Papiunculus cœruleus vulgatissimus*, Blue Argus"; very common on heaths from June to August.

In his "Aurelian," published in 1775, Moses Harris writes: "They are seen in plenty about the beginning of June. See Linn. Papil. Pleb. 232, Argus. Perhaps this is designed for it."

Lewin writes in 1795, "There are at least two broods of these butterflies annually; or rather a constant succession of them from June to September. They are very common, and are to be seen in almost every situation."

POLYOMMATUS ALEXIS.

Brown Argus.

ALEXIS, Scop. Alex'is, a Roman Shepherd, Virg. Ecl. ii. 1.

It cannot cause surprise that a butterfly which has caused so much discussion has had many names. Lewin, in 1795, called it *Idas*, which name was also used in 1803, by Haworth, who transcribes Donovan's remarks in his "Natural History of British Insects," vol. ix, published in 1800: "This insect must not be confounded with the *Papilio idas* of Linnæus. The Linnæan *P. idas* is evidently the female of *P. argus*; a circumstance unknown to that author, who considers them as distinct species, from their very dissimilar appearance." Haworth goes on to say, "The above remarks are very appropriate, and worthy my transcription: but they render it necessary to keep in mind, that the *Papilio argus* of Donovan is not in either of the sexes, the *Papilio argus* of Linnæus or other authors; its male being the *Papilio icarus* of Lewin and of this work, and its female being the *Papilio adonis* of Fabricius, &c. The genuine *Argus* of Linnæus is not figured by Donovan at all. What I have remarked relative to *Idas* being a distinct species with

Linnæus, must be applied to his 'Fauna Suecica' alone; for in the 13th edition of his 'Systema Naturæ,' I find he makes the species *Idas* of the fauna, the proper female of his *Argus*, thereby laudably and liberally correcting in maturer years, this error of his youth."

Possibly Donovan was led into error by Moses Harris, who figures *Icarus* in his "Aurelian," and in the letterpress writes, "See Linn. Papil. Pleb. 232, *Argus*. Perhaps this is designed for it."

The species varies in the expansion of its wings from an inch to an inch and two lines. The upper surface of the wings of both sexes are brown, with a row of bright orange spots at the hind-margin of all the wings, and with narrow white fringes; and also with a black central spot. The underside is of a greyish-brown, with black spots in the white rings, none of which are nearer the base of the fore-wing than the central spots, and with a row of orange spots at the hind-margins. This is the form found in the South of England, and better known as *Agestis*, W.V. It is also the form most frequently found on the Continent of Europe.

Var. *Allous*, Hub. differs from the type by the absence of the row of orange spots. I have a specimen of this form, taken in Castle Eden Dene, in company with *Salmacis*, by my father in August, 1837. In the South of Europe, all the second brood are of this form.

Var. *Artaxerxes*, Fab., Scotch Argus. This differs from the type by the discoidal spot on the forewings being white instead of black, by the row of orange spots being partly, or in some specimens totally, absent on the upper-side; and with the eye-like spots on the underside being entirely filled up with white. This form is unknown on the Continent, and Fabricius received it from Mr. Jones, of Chelsea. These specimens probably came from Dr. Walker, who met with them at Rosslyn Castle, in August, 1797.

Var. *Salmacis*, Steph. Durham Argus, is an intermediate form, has the orange spots less vivid than the type, a black discoidal spot, but the white spots on the underside without black centres.

Var. *Æstiva*, Hub., is a brown variety of the underside.

Varieties also occur in which the spots on the underside differ. One has the central spot only, another is without it, and sometimes the spots are elongated into streaks, a form of variety noticed in several species of the genus.

The sexes of this species closely resemble each other, but in the female the marginal band of orange spots is slightly broader.

The egg is of a pale greenish drab colour, covered with a coarse prominent reticulation; it is smaller than that of *Ægon*, though very like it in form and sculpture, being circular, and flat, with a central depression on the upper surface.—Buckler.

The caterpillar is of a pale green, with a purplish brown dorsal line, and two very pale oblique lateral lines. It is short and thick, arched on the back, covered with fine white hairs, and a black head. It feeds on the leaves of the Sun Cistus (*Helianthemum vulgare*), and the Heron's Bill (*Erodium cicutarium*.)

The chrysalis is smooth, rather thick in proportion, of a pale green colour with a deep pink stripe at the sides, enclosing a central white one, and has the head rounded and prominent.

It is found throughout Europe, North Africa, and Northern and Western Asia to the Himalayas, from May to August, frequenting dry sunny places, especially on chalk or limestone. On the Alps it is found to the tree limit. In the South of England the butterfly appears at the latter end of May, or in June, at the end of which month it may be found in more Northern localities. The caterpillars are to be found in June or July, in the South, and the butterfly is again on the wing in August. The caterpillars of this brood hibernate to reappear in April or May. In Scotland there is but one brood, the caterpillars of which pass the winter quite small, to feed up in the spring.

The white spotted variety *Artaxerxes* seems to be entirely confined to Britain, ranging from Richmond (54½" N.L.) to Kincardineshire (57" N.L.), and in Scotland from sea to sea. Throughout all this district it appears only once in the season. The black spotted variety *Agestis* has a wide European range, from Gibraltar in the South (36" N.L.) to Upsala in the North (60" N.L.); and from England on the West to the Ural Mountains on the East. In England as far North as London and Bristol, it seems to be double brooded; whilst at Liverpool and so Northwards only single, making its appearance simultaneously with the *Artaxerxes* form.

The Southern form *Agestis* was figured by James Petiver in his "Gazophylaci Naturæ et Artis," published at London, in 1702; and also in his "Papilionum Britannicæ," 1717. It was also figured by Lewin in his "Insects of Great Britain," published in 1795, as well as the Northern form *Artaxerxes*, accompanied by the following letterpress—"Brown Blue Idas, Linnæus. This is a common butterfly with us, and to be taken in almost every dry pasture field, or in the open parts of woods, flying, the first insect in June, when it first makes its appearance. There is also a later brood of this species in August."

"Brown White Spot, *Artaxerxes*. This new species of butterfly was taken in Scotland, and is now in the collection of Mr. William Jones, of Chelsea."

In his "Lepidoptera Britannicæ," 1803, Haworth records *Artaxerxes* as being very rare in the fields of Scotland, but not in England, as Christian

Fabricius has said in error, and adds that his specimens were taken in Scotland, by his very dear friend Dr. F. Skrimshire.

In the XVI. Vol. of the "Natural History of British Insects," published in 1813, Donovan writes "To the great astonishment of our English collectors of Natural History in the vicinity of the Metropolis, *Papilio Artaxerxes*, an insect hitherto esteemed of the highest possible rarity, has been lately found in no very inconsiderable plenty in Britain; for this interesting discovery we are indebted to the fortunate researches of our young and very worthy friend, W. E. Leach, Esq., who met with it common on Arthur's Seat, near Edinburgh, and also on the Pentland Hills. A discovery so interesting in the annals of Entomology, because *Papilio Artaxerxes*, was not merely esteemed rare in this country; on the Continent it appears to be totally unknown: there entomologists, till the time of Fabricius, have not mentioned it, nor had Fabricius himself once seen an example of the species; he derived his information solely from a drawing by the hand of W. Jones, of Chelsea. The extreme accuracy of that delineation, it must indeed be allowed, would render it unnecessary for Fabricius to consult the insect from which it was portrayed, but the circumstance is mentioned in order to prove the rarity of the species as an European insect; and we cannot, it is presumed, afford a more decisive testimony of its interest in this respect than in stating Fabricius, its original describer, had never seen it. *Papilio Artaxerxes* is by no means striking in appearance; it becomes important from the general estimation of its scarcity, and its claim to consideration in this view is indubitable. In the best of the English cabinets, with the exception of that of our sincere friend, A. M'Leay, Esq., we have often lamented to observe a deception intended to supply the deficiency of this species; namely, a little painting of the insect, carefully consigned on a pin, to the most obscure corner of the drawer, and which has oftentimes, we suspect, been mistaken for the original: this we apprehend, should not be reprehended in terms of unusual severity—yet we cannot think the custom wholly blameless. We have alluded to the cabinet of Mr. M'Leay, and it will therefore be right to add in explanation that his valuable and extensive collection contained a very fine specimen of *Papilio Artaxerxes*, that had been taken in Scotland previously to the discovery made by Mr. Leach."

Curtis, in his "British Entomology," writes, "Mr. Dale and myself took specimens amongst grass in stony and barren places at the base of Arthur's Seat, the end of June and in August, 1825."

Stephens in his "Illustrations," 1828, writes concerning *Artaxerxes*, "A very local species, and hitherto supposed to be peculiar to Scotland, but it has lately been taken in the North of England." And in the following vol.,

1829, "I have recently obtained specimens of what seems to be a new species of *Polyommatus*, intermediate between *Agestis* and *Artaxerxes*, and which I propose calling *Salmacis*." These were taken in Castle Eden Dene, by G. Wailes, Esq. Mr. Wailes, concerning this, writes to the first volume of the "Entomological Magazine" published in 1833, "I entirely coincide with Mr. Stephens in considering this a distinct species. I must, however, state that Mr. Stephens' description, in his invaluable Illustrations (Haust. Vol. III. p. 235), is not quite correct; for I have observed, out of about 150 specimens that the variety with the black spot forms two-thirds of the whole; and that neither sex possesses exclusively either the white or black spot, though the majority of the former variety are males. It appears to be confined to the sea banks, and I have never seen it above half-a-mile from the coast."

In the same volume amongst the "Observations on the influence of locality, time of appearances, &c., on species and varieties of Butterflies, by J. C. Dale, Esq., M.A., F.L.S., &c." is the following, "*Polyommatus salmacis* is intermediate between *Agestis* and *Artaxerxes*, in Scotland none of the *Agestis* are to be found, they are all *Artaxerxes*; in the south none of the *Artaxerxes* are to be found, they are all *Agestis*. At Newcastle, they appear to be mules or hybrids, between the two species, partaking in some degree of the character of both; some of the varieties have a black spot inside the white one, or the upper surface of the first wings."

This appears to have drawn forth from the pen of Mr. Edward Newman, in the second volume of the same publication, p. 516, the following, "From examining specimens of *Polyommatus agestis* from different localities, I have arrived at a conclusion which will not, I fear be coincided with by many of our Lepidopterists. On the South Downs of Sussex and Kent, *Agestis* assumes what may be called the typical form. I have taken it at Ramsgate, Dover, Hythe, Hastings, Brighton, Rye, Worthing, Little Hampton, Chichester, Portsmouth, in the Isle of Wight, in Dorsetshire, in Somersetshire, and throughout this range it is very similar; then going upwards, I have met with it at Worcester, Birmingham, and Shrewsbury: here an evident change has taken place, the band of rust coloured spots has become less bright; at Manchester, these spots have left the upper wing entirely; at Castle Eden Dene, they are scarcely to be traced, and a black spot in the centre of the upper wing becomes fringed with white, in some specimens it is quite white; the butterfly then changes its name to *Salmacis*. We proceed further northward, and the black pupil leaves the eyes on the underside, until at Edinburgh they are quite gone; then it is called *Artaxerxes*. The conclusion I arrive at is this, that *Agestis*, *Salmacis*, and *Artaxerxes* are but one species.

Mr. Dale, in the "Naturalist," Vol. I., page 16, says, "I have observed a

few of *Artaxerxes* having a slight black pupil to the ocelli on the reverse side; and one I took at Duddington Lock has it more distinct than some of those at Newcastle, where it assumes the name *Salmacis*, some resembling the former, and others differing but little from one southern species or variety *Agestis*, and which have been supposed by some persons to be hybrids. From those who contend for three species, I would request opinions as to specimen lately taken, near Langport, being evidently a remarkably fine female of *Agestis*, having a more complete white spot with black pupil than any I have seen from Newcastle; and I have a specimen or two shewing a little white cincture to the black spot. Surely it would be going too far to make a fourth species, and yet it is better than *Salmacis*. I think this proves beyond doubt that there is but one species. Mr. Bentley has a beautiful variety of *Agestis*, totally destitute of black ocelli on the reverse side."

Mr. Sircom, writing to the "Zoologist," Vol. II., says, I have in my small collection *Salmacis*, which I captured on Durdham Down, Bristol. The cabinet of one of my friends contains a similar specimen, taken in the Isle of Wight."

In his elaborate notice of *Agestis*, in his "Catalogue of the Lepidoptera of Northumberland and Durham," published in 1858, George Wailes concludes with "I think I am justified in writing the three forms of this butterfly, under the single name of *Agestis*," thus retracting his former opinion.

When Professor Zeller, in 1867, published his most interesting history of this species in the "Entomologists' Monthly Magazine" (Vol. 4, p. 73-77), he stated it to be generally accepted that *Polyommatus Artaxerxes* is only a variety of *Agestis*; and yet it appeared to him extremely improbable that the caterpillars of *Agestis* should habituate themselves to the food-plant of *Artaxerxes*. However, in Vol. 6 of the same periodical, he writes thus, "On the 8th May, this year, 1869, I received four caterpillars of *Artaxerxes*, sent expressly for me from Edinburgh. Three were full grown, so that one was a chrysalis already on the 10th. The fourth was much smaller; and as the *Helianthemum vulgare* does not grow in the vicinity of Stettin, I offered it some young plants of *Erodium cicutarium*, and lo, it bored directly into a flower bud, which on the following day I found eaten out." On the 3rd June, 1877, Mr. Robson, of Hartlepool, whilst searching *Helianthemum vulgare* growing near the coast in his locality, found five caterpillars of a *Polyommatus*, which he at once forwarded to Mr. Buckler. These he fed upon *Helianthemum*, and they in a short time entered the chrysalis state; two of them were, unfortunately, attacked with mould, but the other three disclosed three differently marked butterflies, viz. on July 2nd, 5th, and 7th. These appeared to be respectively *Salmacis*, *Artaxerxes*, and *Agestis*, but to partake most

of *Salmacis* on the underside. These larvæ were all alike, and in no respect distinguishable from larvæ of *Artaxerxes* found at Arthur's Seat, and previously reared by Mr. Buckler.

POLYOMMATUS ÆGON.

Silver-studded Blue.

ÆGON, W.V. Ægon, a Roman Shepherd, Virg. Ecl. iii. 2.

This species varies in the expansion of its wings from an inch to an inch and two lines. The male has the upper surface of the wings of a deep purplish blue, with dusky hind margins, and white fringes. The female is brown, sometimes much suffused with blue, and has a row of orange lunules at the hind-margin of the hind-wings, most distinct at the anal angle. The underside is bluish-grey in the male, greyish-brown with bluish base in the female, and has a marginal band of fulvous spots, and three rows of black spots in narrow white rings. On the underside of the hind-wings, near the edge, is a row of metallic spots of a bluish tint, shining like polished silver, from these Moses Harris named it the "Silver-studded Blue." Some striking varieties of this species have been observed. In one, captured by Mr. Hatchett, at Coombe Wood, the upper surface of all the wings is of a pale fulvous tawny colour, like that of *Satyrus pamphilus*. Mr. Briggs has an exceedingly pale specimen, and I have one with the right wings male and the left wings female. In another, taken by Mr. Haworth, in salt marshes near Holt, Norfolk, and thence named by him *P. maritimus*, the ocelli on the disc of the underside of the wings are elongated into those on the middle of the wing, being almost confluent with the following row of spots. To a specimen of this variety, the Rev. W. Kirby applied the manuscript name of *Alcippe*, but Mr. Stephens applies that name to another, and apparently very distinct variety, of smaller size, having the wings narrower, blue above, with a broad, black margin to all the wings, the underside of the male of a deep greyish or drab colour, the ocelli very distinct in the female, and the oblique series on the posterior wing consisting of four. This is probably the *Algidion* of Gerhart. The variety *Leodrus*, Hub., is brown, and has the orange band very distinct on the upper surface of all four wings. The variety *Bella*, H.S., found in Asia Minor, has the underside of the wings paler than the type, and a row of marginal spots. I have a brown variety of the female which has the marginal row of spots wanting, and replaced on the lower wings by a marginal row of white rings.

The egg is rather large in proportion to the size of the butterfly. It is white in colour, of a circular form, flattened and depressed in the centre both

above and below, covered with raised white reticulation, all except the top.—Buckler.

The caterpillar is of a bright yellow green, with black head and legs, a blackish brown dorsal line edged with white, and yellowish green oblique marks on the back and sides. It feeds on *Ornithopus perpusillus*, and probably on some of the lesser trefoils, as *P. agon* occurs in Portland, whereas the *Ornithopus perpusillus* is not known there.

The chrysalis is less than half-an-inch in length, and of a dull green colour with a brown dorsal line, the wing cases being rather long in proportion.

The butterfly emerges from the chrysalis state at the end of June or July, and continues on the wing for about two months. In 1877, I met with it as late as the 17th September. The eggs do not hatch till spring, the dates being from the end of February to about the end of March. The caterpillars feed but slowly, changing their skin for the last time from 11th to 15th June, and turning into chrysalids by the 24th, remaining in that state about three weeks. The chrysalides are generally slightly attached, after the usual manner of the genus, viz. by a button at the tail and a belt of silk round the middle, to a stem of the food-plant, at the very bottom and partly in the earth: sometimes they are attached to large stones.

It appears to be generally distributed throughout Central and Southern Europe and Asia Minor, frequenting heaths and stony pastures. In England it is widely but not generally distributed; but is scarce in Scotland, not being found north of Perthshire; and it also occurs at Wicklow, in Ireland.

It was figured in 1717, by James Petiver, in his "Papilionum Britanniaë," under the name *Papiunculus plumbeus parvus*, Small Lead Argus." Moses Harris, in his "Aurelian's Pocket Companion," published in 1775, records it as haunting commons. Lewin, in 1795, writes "This pretty little butterfly is very common. It is out on the wing the second week in June, and flies mostly in low reedy meadows."

Family ERYCINIDÆ.

The only notable distinction between this and the last family is in the perfect insect, the males of which, in the Erycinidæ have only four perfect legs, while the females have six. Both sexes of the Lycænidæ have six perfect legs.

The Erycinidæ are most numerous in Tropical America, but several are found both in Asia and Africa, but only one in Europe, which occurs also in Britain. They are of small size, and extremely varied in their forms. Thus

some of them resemble the tailed species of Papilionidæ and Nymphalidæ; others the long-winged Heliconidæ; others the blue and copper species of Lycænidæ; and some the dusky and spotted Hesperidæ. About 700 species are included in Kirby's Catalogue of 1871. The curious *Libythea*, included by Kirby with the present group, has one European species, *Celtis*. It has a caterpillar like those of the Pieridæ, a chrysalis suspended by the tail only like Nymphalidæ, and the perfect insect has brush-like fore feet in the male like the Erycinidæ.

GENUS XI.—NEMEOBIUS.

Stephens.

NEMEOBIUS.—Nemos, a grove, and bios, life.

A genus of but a single species, which does not occur outside of Europe. It is a very interesting insect, being our sole representative of this important family. It is generically nearly allied to *Zemeros*, a genus found in various parts of the East Indies, Java, and China; but the elongated, acute, very hairy palpi, the pilose eyes, the strongly clavate antennæ, and the curious arrangement of the veins of the hind wings, separate it from all the adjacent genera. Looking at the series of European, or still more restrictedly, at our British butterflies, this species fills an important station between the butterflies with girted chrysalides, having fully developed feet in both sexes, and those butterflies in which the fore feet of the males are brush-like, all of which inhabiting Europe, have simple suspended chrysalides. This position was assigned to the genus, with admirable tact, by Dennis and Schiffermüller, in the "Wiener Verzeichniss," or Vienna Catalogue, more than a century ago.

NEMEOBIUS LUCINA.

Duke of Burgundy Fritillary.

LUCINA, Linn. Luci'na, a goddess of women. Virg. Ecl. iv. 10.

Though this little butterfly bears the name of Fritillary at the end of its lengthy and important title, it belongs to a very different family to that of the true Fritillaries, and it has only shared their name on account of its similarity in colour and markings to those of the genus *Melitæa*.

It is chequered on the upper surface with tawny, and dark brown or black. The underside is reddish-brown, with black marginal dots, and two rows of whitish spots on the hind wings. The width across the wings varies from an inch to an inch and a quarter.

The egg is globular, shining, of a pinkish grey colour, and covered with very delicate, black, diamond-shaped reticulations.

The caterpillar, instead of being long and spiny, like those of the true Fritillaries, is short, thick, and of a woodlouse shape. Its colour is reddish-brown, or a pale olive brown, with tufts of hair of the same colour and black dots, black spiracles, and a greenish-yellow spiracular line. It feeds on the leaves of the primrose and of the cowslip, from June to September, when it then enters into the chrysalis state.

The chrysalis differs from that of the true Fritillaries as much as the caterpillar does, being attached by the tail, and with a belt of silk round the middle, to the underside of a leaf of the food-plant. In that state it remains over the winter. It is of a pale yellowish brown colour, with numerous distinct black spots and marks; it is short and stumpy, and covered with hair in the same manner as the caterpillar.

Lucina is common in woods in many parts of Central and Southern Europe, extending from the South of Sweden to the Northern parts of Greece and and Turkey. It is generally distributed over England, but does not occur in the two counties at the north-eastern boundary—Durham and Northumberland. On the other side, it has been met with in the counties of Westmoreland and Cumberland. It has not been found in Ireland or the Isle of Man, and only in the extreme South-west of Scotland.

It was figured by James Petiver in his "Gazophylacii Naturæ et Artis," in 1702; and also in his "Papiliorium Britannicæ," 1717. Of it he writes, "*Papilio Fritillaria minor*. Vernon's small Fritillary. It's the least of all the Fritillaries yet known. Found in several woods round London."

Moses Harris, in his "Aurelian," published in 1775, writes "The Duke of Burgundy Fritillary, commonly called the Burgundy, is one of the four Fritillaries which want the silver spots, and is the least of them all. They always fly in woods not very high above the grass. Their most plentiful time of flight is about the middle of May. They are very nimble, yet I cannot say they are difficult to take."

In Ray's "Historia Insectorum," 1810, we read, "This was first observed by Mr. Vernon, about Cambridge, afterwards in Hornsea Wood, near London, by Mr. Handley, and by Mr. Danbridge at Boxhill, and is pretty common about Dulwich."

Why this little butterfly was named the Duke of Burgundy must remain a mystery, as the high sounding and sex-quipedian name is by no means in harmony with the diminutive size of the species, but "Parvum parva decent," says the proverb. The Rev. F. G. Morris, in his "History of British Butterflies," informs entomologists generally "that it is not his province to

write a work on "Titles of Honour," nor to give any genealogical account of the Duke of Burgundy Fritillary. "So far, however," he goes on to say, "the name is appropriate in that dukes and these butterflies are alike somewhat rare, and from his blazon of the plate it will be seen that the latter, as is only ducal, have numerous quarterings."

This brings to a close the first division of the Butterflies, viz., "Succinctæ," consisting of those which have girted chrysalides, so called because the body is supported by a silken girth or belt.

The next division is called "Pendulæ," so called because the chrysalides are attached by the tail only, and swing in the air, with the head pointed towards the ground.

Family SATYRIDÆ.

This family is of considerable extent, and almost universally dispersed over the surface of the globe; the number of species found in Europe is, in fact, considerably greater than one-third of the whole of the European butterflies. With the exception of one genus, *Melanargia*, which contains the species known as Marbled Whites, the family consists of exceedingly dull coloured butterflies of various shades of brown, the underside of the wings being ornamented with eye-like spots.

So large a family has been divided into 60 genera, but as the differences are often very slight, most of them may be considered in the light of sub-genera or sections. A few species have been separated from *Satyrus*, and formed into a genus (*Pararge*), on account of the eyes being hairy, and yet the genus *Polyommatus* contains some species with hairy eyes and others with naked eyes.

GENUS XII.—MELANARGIA.

Meigen.

MELANARGIA, from Melan—black, and Argoe—silvery.

The generic name *Melanargia* was bestowed in 1829. Hubner, in 1816, named the genus *Arge*, but as *Arge* is the name of one of the species contained in the genus, and also the name of a genus in the order Hymenoptera, we cannot do better than adopt Meigen's name of *Melanargia*.

The species of this genus may be at once distinguished from all others of the family by the ground colour of the wings, which is white, more or less marbled with black. There are eight species, seven of them being European, the warmer shores of the Mediterranean being the home of the genus. Two or three are found in Asia, but only one, *Meridionalis*, is confined to that Continent. Only one is British.

MELANARGIA GALATHEA.

Marbled White.

GALATHEA, Linn. Galathea, a nymph beloved by Acis and the horrible Polyphemus.

The wings of this, the only British representative of the genus, expand from one inch and three-quarters in the male, to two inches and a quarter in the female. The ground colour is a creamy white, much marbled with black. On the underside, the pale tint very much preponderates, much of the black masses of the upper side being reduced to mere lines. The male has the underside of the hind-wings of a much whiter shade, and the female of yellowish shade. It may be readily distinguished from the other Whites by having only four walking legs, instead of the six which all the rest have, and also by the eye-like spots, most visible on the underside.

It is a variable species. Specimens have occurred almost perfectly white, and others almost black, the latter are not common in Southern Europe, but I have one taken at Dover, by Mr. Le Plastrier, and figured by the Rev. T. Bree, in "Loudan's Magazine," for 1832. The upper wings are nearly black above, except a large white spot near the base, and another tripartite at the lower edge; and beneath, both pairs are clouded with black, and almost destitute of the usual angular tessellated markings.

I have another which differs from the type in the ground colour being of a yellowish buff, with pale yellowish brown markings in lieu of black. This is the var. *b.* of J. F. Stephen's "Illustrations."

Specimens are also occasionally found in which the cream colour of the wings is replaced by pure white.

On the Continent, a curious form of the female is found, which Esper called *Leucomelas*. It has the underside of the hindwings without the black markings. The almost black form is called *Turcica*. Another form from the south-east of Europe is called *Procida*, and which Dr. Staudinger describes as *obscuria*. A fourth named variety is *Galeræ*, which wants the eyed spots. In the second volume of the "Zoologist," Mr. Thomas Marshall writes, "I took last July, on the heights between Dover and Walmer, a male of a clear milky white colour, and has neither on the upper or underside of the wings the smallest speck of black. Its thorax, body, and palpi are also entirely clothed with white. The specimen is in perfect condition."

The egg is large and ovate, and its shell looks like dull bone-white china, being covered all over with very shallow rhomboidal network, with very tiny knobs at the knots, and with a central patch of finer meshes on the top.—
Rev. J. Hellins,

The caterpillar is variable in colour, the most ordinary one being buff with darker dorsal and lateral streaks. Another is of a yellowish green, with red dorsal and lateral lines. It feeds on *Phleum pratense*, *Dactylis glomerata*, and other grasses; it hibernates when very small, becomes full-fed in June, and changes to a chrysalis without suspending itself in any way, or making a cocoon.

The chrysalis is very stout and plump, and of a pale, putty white colour, with a broadish yellow stripe down the middle, and the wing cases are freckled with pale brown.

M. Galathea is one of the most abundant butterflies in central and southern Europe (but does not occur in Spain or Portugal, Scandinavia, or the north of Russia), frequenting meadows and open places in woods, during the months of July and August.

In the British Isles, it is entirely confined to England, and does not occur at all in the more northerly counties, Yorkshire being the furthest north in which it is found. In the midland and more southern counties it is common enough where it occurs, but this is always very restricted. It has apparently a great partiality for the chalk downs of the south coast; roughish ground and broken pastures being also favourite habitats.

The first to record it as a British species appears to have been Dr. Christopher Merratt, F.R.S., for in his "Pinax rerum Naturalium Britannicarum, continens vegetabilia, Animalia, et Fossilia, in hac Insula reperta inchoatus," he gives the following description of a butterfly: "Capite alisq, lacteis quibus maculæ furcæ et nigricantes."

In his "Historia Insectorum," published in 1710, John Ray thus records it: "Mense Junio circa Festum S. Joannis Baptistæ primo circumvolitantem observari hoc anno (1690) in locis palustribus et humidis præcipue. Verum ver valde frigidum erat. Hanc speciem D. Petiver in Mus. cent. 1. Papiionem leucomelanon appellat, Angl. Our Half-mourner. Apud nos circa Braintriam in Essexia frequentissima, nec rarior, ut puto, alibi in Anglia."

In his "Insects of Great Britain" in 1795, Lewin writes: "This butterfly is to be met with in dry meadows or pasture lands. It does not range abroad, but is locally attached to the place where it was bred, so that it was common to see fifty, sixty, or a hundred on the wing in one meadow, and in the fields adjoining not one. It lays its eggs, scattering them about the meadows, and as the eggs are not glutinous, they drop among the grass, and rest in security, till the proper time for the caterpillars to make their appearance. The caterpillars are bred from the egg the latter end of July, and feed on meadow grass the remaining part of the summer. On the approach of winter they conceal themselves in the ground, and abstain from food till the

month of March, when they feed again on the young and tender shoots of grass. In June they arrive at their full growth, and change to chrysalides about the middle of the same month."

GENUS XIII.—HIPPARCHIA.

Fabricius.

HIPPAR'CHIA, from the Greek, signifying the command of the cavalry, probably given in consequence of the species being of the brown colour so common amongst horses.

The name *Hipparchia* was bestowed upon the genus by Fabricius in 1807; and the name *Satyrus* by Latreille in 1810. Satyrus, a Satyr, a rustic deity, half man, and half goat. Virg. Ecl. V. 73.

The species are of various shades of brown, and generally have eye-like spots on one or both pair of wings. The caterpillars are pisciform, or somewhat like a fish, that is, attenuated behind, the tail ending in a small fork; in general they are pubescent but without spines: the head is more or less rounded, and sometimes heart-shaped.

It cannot create surprise that such a very large genus has been split into several. Kirby in his 1871 "Catalogue of Diurnal Lepidoptera" gives sixty. For our British species I shall retain three—*Melanargia*, *Hipparchia*, and *Erebia*. *Hipparchia* though, I shall divide into five sub-genera or sections—*Lasiommata* for the hairy-eyed species *Ageria* and *Megara*; *Hipparchia* for the largest species, *Semele*; *Satyrus* for *Janira*, and *Tithonus*; *Enodia* for *Hyperanthus*, and *Cænonympha* for the light brown species—*Typhon* and *Pamphilus*. The first corresponds to the section *Vicicoles*, of *M. Duponchel*, the second to his *Rupicoles*, the third to his *Herbioles*, the fourth to his *Ramicoles*, the fifth to his *Dumicoles*. *Melanargia* corresponds to his *Graminicoles*, and *Erebia* to his *Alpicoles*.

SUB-GENUS LASIOMMATA.

Westwood.

This sub-genus is at once distinguished from the rest by having the eyes thickly clothed with hairs, in addition to which the palpi are very slender. The antennæ are straight, distinctly annulated with black and white, and club pyriform. Sixteen species are known, two of them occurring in Britain. All of them are confined to Europe, Asia, and the north of Africa. This sub-genus corresponds with the first section of *Hipparchia*, of Curtis and Stephens, and contains Hubner's two groups, *Pararge* and *Dira*.

HIPPARCHIA ÆGERIA.

Speckled Wood

ÆGERIA, Linn. Ægeria, a nymph, who was supposed to have favoured and instructed Numa Pompilius, third King of Rome. Ovid, Fast. III, 275.

This and *Leucophasia sinapis* (the Wood White), differ greatly from all our other British butterflies, in choosing shady habitations instead of the open situations so suitable to true children of the sun.

The wings expand from one inch and three-quarters to a couple of inches, and are of a dark brown, with creamy white patches of variable size, placed irregularly; the one nearest the tip of each forewing being ornamented with a white pupilled black eye-like spot, and three of them near the hind margin of the hindwings are ornamented in a similar manner. On the underside the hindwings are varied with lighter and darker undulations, and have a row of six white dots, varying in size, near the hinder margin. The females have the larger and more numerous spots.

Very few varieties are known. I have one, however, which has the white-centred black spots on the hindwings without the creamy white rings. A named variety, *Meone*, Cramer, has the creamy white replaced by orange or a tawny hue, and is the common form in Africa and the south of Europe. Another, very closely allied, *Ziphia*, Faber, is the Maderian form. Another with a bipupilled eye occurs in the Channel Islands.

The egg, which is deposited singly on blades of grass, is of a whitish-green colour; its shape is ovate, with upright sides and round top, without ribs, but with a very glossy shell, covered all over with fine irregular raised network.

The caterpillar, which feeds on *Dactylis glomerata*, and other kinds of grass, is of a dull brownish-green, with a darker dorsal and a paler spiracular line, covered with short hairs, which gives it a soft velvet-like appearance.

The chrysalis, which is suspended by the tail, is short and dumpy, and of a green or brownish-green, with markings of a darker shade.

There are apparently three broods of the butterfly during the year. The first is generally on the wing by the middle of April, sometimes earlier. In 1868, I captured it at large as early as March 25th, and it has been bred from the chrysalis as early as March 7th. The eggs, being laid, soon hatch, and the caterpillars become full-fed in June or July. By the end of the latter month the butterfly is again on the wing. The second brood of caterpillars may be found in August, and feeding up rapidly soon enter the chrysalis state, the third brood of butterflies appearing in September and October; in 1866, I met with it as late as November 2nd. The third brood of cater-

pillars hibernate when young, and feeding up in the spring, enter the chrysalid state the beginning of May. The April butterflies are probably produced from some of the second brood of caterpillars, which hibernate when almost full-fed, and enter the chrysalid state in March.

This is a common butterfly throughout the greater part of Europe, North Africa, and Western Asia. In the British Isles it is distributed more or less abundantly, with the exception of the Isle of Man and the extreme north of Scotland, the Isle of Skye being its northernmost limit.

It frequents shady lanes and woods, and is particularly fond of stormy weather, appearing in Dorsetshire in the wet summer of 1879, in the greatest abundance, but very sparingly in the dry summers of 1870 and 1887. The shady woods and wet climate of Dunegan, in the Isle of Skye, seems especially adapted to its requirements.

It was figured and described as long ago as 1633, by old Moufet; and also described in 1667, by Dr. Merrett in his "Pinax." Petiver in 1717, figured it in his "Papiliorium Britannicæ Icones," calling it the *Enfield Eye*, from the place he first observed it in. Lewin in his "Insects of Great Britain" writes, "This butterfly is peculiar to woods, and may be seen flying as early as the middle of April. This brood is from the caterpillars that have lived through the winter, and have changed to chrysalis at the end of March, in which state they remain for about twenty days, when the flies are perfected. The caterpillars feed on grass, and go through the different changes exceedingly quick, so that there are not less than three distinct broods of the flies in one summer."

HIPPARCHIA MEGÆRA.

The Wall.

MEGÆRA, Linn. Megæ'ra, one of the Furies. Virg. Æn. XII. 846.

This is called the Wall Butterfly, from its fondness for settling on walls. It has also a partiality for banks and roadways. It belongs to the section *Dira* of Hubner.

The wings expand from one inch and three quarters to a couple of inches, and are of a brownish colour with a very large patch of a fulvous yellow on forewings, with transverse brown lines. Near the tip of each forewing is a large eye-like spot with a white pupil; and the hindwings have a row of from three to five eye-like spots varying in size, the middle ones with white pupils. The male has a broad oblique stripe on the forewings. The underside of the hindwings is beautifully freckled with yellowish grey and brown. It is very similar to *Mæra*, Linn., which has been erroneously recorded as British; and I possess a variety taken by Mr. Pretor, in August, 1856, at Sandesfoot

Castle, near Weymouth, which appears to be somewhat intermediate, the hindwings and the basal portions of the forewings being quite a pale brown, almost drab. A very curious variety is in the collection of Mr. Bond: the forewings are of the usual type, but have an extra small eyed spot close to the top. The hindwings are semi-transparent, with eyed spots on a fulvous band and slight fulvous marks nearer the base. Mr. Stephens, in his "Illustrations," describes a variety with the wings nearly transparent, the scales being sparingly distributed over the surface, but all the usual markings visible. Occasionally the characteristic dark band of the male is wider than usual, making the specimens look very dark; and I possess a specimen in which paler portions of the wings are almost white. Examples with more than three eyed spots on the hindwings are not uncommon. The underside has generally six or seven, but there are seldom more than four on the upperside. Sometimes the eye is bipupilled. The variety *Lyssa*, Boisd., from South-eastern Europe and Asia Minor, has the hindwings of a grey colour on the underside, somewhat like my specimen from Weymouth; and the variety *Tigelius*, Bon., from Corsica and Sardinia, is smaller and darker fulvous than the typical *Megara*.

The egg, which is deposited singly on blades of grass, is of a pale green colour at first, then whitish, at last dull greenish-white, with some dark purplish spots on the top. In shape it is somewhat truncated and conical, with rather a round top.

The caterpillar is of a dull green, with a darker dorsal and a lighter spiracular line, and covered with minute warts, each of which emits a short hair. It feeds on *Dactylis glomerata*, and other kinds of grasses.

The chrysalis is suspended by the tail, and has two varieties of coloration, green and a very dark brown. It has a short, stout, flattened, oval spike, the tip of which is thickly set with pale, curled spines.

The butterfly appears in May, in which month or early in June, the eggs are laid singly on grass stems. The caterpillar is full-fed by the middle or end of July, and the species remains a month—sometimes less—in the chrysalis state, the second brood appearing in August, and continuing to fly almost to October. The eggs are generally laid in August, and hatch in a few days, the caterpillars feeding during the autumn, and hibernating, enter the chrysalid state at the end of March or middle of April. About the end of March, 1881, the Rev. J. Hellins captured two caterpillars on grass; about the middle of April these became chrysalides, and the butterflies appeared on May 13th and 21st, these had come from eggs laid in the preceding July or August, and had hibernated as caterpillars. (See Buckler's Larvæ, appendix by Rev. J. Hellins).

It is found all over Europe, except in the polar regions, in Northern Asia, and Asia Minor, also in the north of Africa. It is, or at least was, a common butterfly in all parts of England and Wales, but appears to have become very scarce in the north of England, as Mr. Robson has only seen a solitary specimen since 1860 in the Durham district. Dr. Buchanan White makes the same remark in reference to Perth, adding "The series of cold summers following that year seem to have destroyed the species." In the south of England it is still a very common butterfly, and also in Ireland. It occurs in the Isle of Man, and is found in Scotland as far as Argyleshire.

The first English author who appears to have noticed it was Dr. Christopher Merrett, who in his "Pinax," published at London in 1667, described it thus, "Oculo nigro, pupilla candida, alisq; Dracontii modo varius," which means that it is freckled after the manner of Dragon-wort. Ray informs us "It is not unfrequently seen after midsummer," and calls it "the Golden Marbled Eutterfly, with black eyes; but Petiver calls it the 'London Eye.'" Lewin informs us that it is very common in lanes, road sides, and barren places in woods, and that it frequently settles on the trunks of trees.

SUB-GENUS HIPPARCHIA.

This sub-genus corresponds to the section *Eumenis* of Hubner and *Rupiciles* of M. Duponchel; and contains forty species or more, including the largest of the family.

M. Marloy has published a short notice upon the caterpillars in the "Annales" of the French Entomological Society for 1838, stating that the chief cause why they are so seldom met with is that they conceal themselves and remain inactive during the day, but come forth to feed by night, when they may be found in great numbers with the help of a lamp. The caterpillars of *Circe*, *Briseis*, *Fidia*, and *Semele* form large cocoons underground, composed of grains of earth fastened together with a little silk. Their chrysalides are short, ovoid, glabrous, with the head obtuse and tail pointed.

Another point of distinction may be seen in the perfect insect, which has the antennæ with a short abrupt club.

HIPPARCHIA SEMELE.

Grayling or Black-eyed Marble.

SEMELE, Linn. Sem'ele, the mother of Bacchus, the God of wine.

This fine butterfly is the largest British species of the family, some of the females measuring two inches and three-quarters in expanse. The males are

smaller, being as a rule half or quarter of an inch less across the wings. Though a powerful looking insect, its flight is by no means swift, and it is captured without much difficulty. The upper surface of the wings is of a dull brown, with a broad, wavy, creamy white band near the hind margin. In this band are a couple of white centred, black, eye-like spots on each forewing, and a smaller one near the anal angle of each hindwing. The female has the band very distinct, but it is very indistinct on the forewings of the male, and on the hind wings a fulvous tinge. The underside of the forewings is of a creamy white, with a fulvous tinge; the underside of the hindwings is clouded with white, brown, and black, the base darkest. The antennæ are brown above, with the under part ochraceous. The intensity of its colourings varies greatly. In some specimens the upper surface is nearly black; in others the marginal band is nearly flavescent, with a few brownish clouds; beneath, the anterior wings are frequently very deep brown at the base, with a dusky bar across the centre, and the hind-margin of the same colour; and the posterior wings are occasionally marked with a zig-zag, irregular, central ochraceous band. The eye-like spots also vary very much in size. Scotch specimens are larger and darker than those from the South of England. Many Irish examples are much redder than the type, and closely resemble those from Portugal and the north-west of Africa. A variety, *Aristæus*, with the paler portion of the wings yellower than the type, occurs in Corsica and Sardinia. Another, *Mersira*, has the underside of the hindwings uniformly grey, instead of being marbled and mottled as in the ordinary type, and is found in Cyprus and in Asia Minor.

The egg appears never to have been described.

The caterpillars, when young, are ochreous, with a black interrupted dorsal line; when full-grown they are an inch and a half in length, tapering much to the anal forked extremity, and a little towards the head, which is globular. It is of a delicately mottled drab colour, with darker stripes. The dorsal line is olive-brown, and the spiracular line pale ochreous-brown, edged with brownish-white both above and below. The head is brown, on it the principal stripes of the body are delicately marked with darker brown. The legs are of a drab colour, and the spiracles are black. It feeds on *Aira præcox* and *cæspitosa*, and other kinds of grasses; and is remarkable for changing to the chrysalid state below the surface of the ground in a slight cocoon.

A captured caterpillar, which had been dug up by Mr. Buckler, on May 20th, 1864, from a waste piece of sandy ground near the sea, amongst early hair grass (*Aira præcox*) and other small grasses, on being placed under a glass in a pot, immediately burrowed in the sandy earth, and the few times it

was seen on the grass were always at night, and each morning brought evidence of its doing well by the diminished grass.

The chrysalis, like most other subterranean chrysalides, is deep dark red in colour, and smoother and more regular in shape than its congeners.

The butterfly emerges in the end of June, more frequently about the middle of July, and continues on the wing till past the middle of September. The eggs are generally laid in August, and are deposited singly on the food-plant, and hatch in a few days. The caterpillar feeds very slowly in the autumn, and hibernates when quite small. It feeds up in spring, and is not difficult to find at dusk, or often dark with the aid of a lantern, as its pale colour contrasts well with the grass stems. Lewin states that "it rarely ventures out to feed, except in the evening, for fear of birds, which are always searching for this kind of caterpillar." It becomes full-fed about the middle of June, and remains nearly a month in the chrysalis state.

Hipparchia Semele is found throughout Europe except in the Polar regions. It is also found in Asia Minor, and in Algeria and Morocco in Africa. It is considered a local species in Britain; but this is most likely only because the country is so highly cultivated. In England it occurs in nearly all our counties, and often abundantly. It is generally distributed throughout Ireland and the Isle of Man. In Scotland it occurs as far North as Sutherland, Scottish specimens being slightly larger and darker than English ones. Although rather local in Perthshire, it is an abundant species where it does occur. Its favourite haunts are warm rocks, such as Kinnoul and Moncrieffe hills, and in such situations it is very common. It appear to be attached to heaths and dry pastures, but is sometimes found in dry woodlands; and is easily taken, as it is not active in flight, and settles on the bare ground when it possibly can. Sometimes it settles on the trunks of trees, or on rocks.

The Rev. John Ray appears to have been the first to record it as a British species. In his "Historia Insectorum" he writes thus, "Hæc à D. Tillema Bobarts ad me transmissa est. Huic similis anno 1697, miki communicata est ab ingeniosissimo viro D. Davide Kreig M.D. Annabergensi Saxone, in collibus Gogmagog dictis agri Cantabrigiensis inventa, &c."

Petiver in his "Gazyophylacium," 1704, calls it "The Tunbridge Grayling," and adds, "it is very rare about London."

Wilkes, in his "Aurelian," 1742, calls it "The Rock Underwing," and informs that "it is taken near Coombe Wood, in July."

SUB-GENUS SATYRUS.

Boisduval.

SATYRUS, a rustic deity, half man and half goat. Virg. Ecl. v. 73.

Contains the sections *Epinephile* and *Pyronia* of Hubner. Of the first, we possess one British species, *Janira*; and of the second likewise one, *Tithonus*. According to Kirby's Catalogue, 26 species belong to this Sub-genus, from various parts of the globe, five of them occurring in Europe.

The hindwings are slightly dentated, and the antennæ are gradually clubbed. The male has a broad black streak on the forewings, which distinguish it from the next sub-genus. The underside is of a fulvous colour generally. The caterpillars are spindle shaped, and covered with fine hair.

HIPPARCHIA JANIRA.

Meadow Brown.

JANIRA, Linn. *Jani'ra*, one of the Nereids.

This most abundant species varies in the expansion of its wings from one and a half to two inches, the female being the larger. As its English name implies, the prevailing colour of the wings on the upperside is brown, of a very dark shade, especially in the males. Both sexes have a black eye-like spot, with a white centre inside of a fulvous ring, near the tip of each forewing; and the female has, instead of the ring, a large fulvous patch, which is sometimes also slightly visible in the males. The underside of the forewings is fulvous; of the hindwings greyish brown, with a paler band towards the hind margins, which is marked with two black dots in the male. The markings vary greatly in size, as well as in colour; and the eyed spot is sometimes without any, and sometimes with two white dots, occasionally also it is accompanied by a secondary eyed spot above, and a black spot or two beneath. Linnæus mistook the sexes of this butterfly for different species, to which he gave the names of *Janira* and *Jurtina*, but their specific identity has long been established. In such cases the name given to the male specimens is retained if that of the female. Although the female as a rule is very distinct, yet it occasionally appears with all the coloration of the male.

This species is exceedingly subject to variation of a very peculiar kind, namely, in the presence of large blotches, or sometimes of an entire wing, having the appearance of being bleached, the usual brown colour being absent in such blotches, and a kind of dingy white appearing in its stead. Various suggestions have been made to account for these white varieties, that most generally received being that the discolouration has been caused by the rays of the sun, concentrated by a drop of dew. "I cannot see," writes Mr. Robson, "that the explanation is satisfactory, for the bleaching is as often on the hindwings as on the forewings, and as the one covers the other in the chrysalis, the hindwing would not be bleached from this cause, with-

out that part above it being also affected. Besides if a dew drop could thus concentrate the rays of the sun like a burning glass, the chrysalis would be first affected, and the insect so injured as not to be likely to emerge." Mr. Robson has seen no other species marked in the same way, except one specimen of *Erebia Blandina*, in his own collection, which has the left wing so affected; but Mr. Mosley has figured a specimen of *Thecla rubi*, from Mr. Gregson's collection, which may decidedly be called bleached. In the British Museum is a singular specimen of this variety of *Janira*, which is remarkable for the confluence of the discoidal patches on the forewings. The most beautiful I have of these bleached examples is a male, which I captured at Glanvilles Wootton, on June 28th, 1864. The specimen is apparently fresh from the chrysalis, and what is left of the dark colour is of a very rich dark brown indeed, being mostly at the base and round the margins. All the wings are coloured in a similar manner, and on both the upper and undersides; the eyed spot being almost hidden. Four other males I have of this kind. One has the right wing white, other wings of the normal type. A second has the two right-hand wings almost white. A third has a white patch near the hind margin of both left-hand wings. A fourth has a slight white patch on the two forewings. Females of this variety are more scarce, but I have one which I took at Glanvilles Wootton, on July 2nd, 1872, with the right-hand forewing entirely white, and the eyed spot scarcely showing. Mr. Tugwell has a very remarkable example with the right forewing quite white, with the exception of the eyed spot, and a few yellowish streaks near the centre. The hindwings on the same side have a yellowish-white band, corresponding with the pale band of the underside. The wings on the opposite side are very different, the forewing being marked more like the ordinary female, but yellow instead of fulvous, while the hindwing resembles that on the right side, except that the band is yellow instead of white. A female I took at the Land's End, in August, 1864 (the great year for bleached varieties), has the fulvous patch on the forewings replaced with yellowish-white. Another very extraordinary form is what may be called the drab variety. It has all the wings of a very pale brownish drab, with the eyed spot scarcely showing. The finest specimen of this variety I captured at Glanvilles Wootton, on June 20th, 1864; being singularly enough the first of the species I saw in that season. Another very extraordinary form has all the wings of a very pale ochraceous, except a fulvous patch, in which the eyed spot is situated. It was taken by my father in the Isle of Arran, on July 29th, 1825. A female I took in the Isle of Harris, on July 29th, 1883, has a distinct fulvous band on the hindwings. The undersides of the males from that locality are unusually dark. Perhaps these belong to the variety named in

the "Scottish Naturalist," as *Splendida*, by Dr. Buchanan White, who describes it as follows: "Larger and brighter coloured, the apical spot of the front one with two white dots (mine has only one). Found by Mr. Davidson in the Island of Longa, on the west coast of Rosshire, being the only form occurring there." He goes on to say, "that it occurs occasionally in Aberdeenshire; and that he has taken it in the island of Capii, near Naples." The South European variety, *Hispulla*, Hubner, is a large richly coloured form, expanding nearly two inches and a half; the black spot at the tip is very large, the light markings of a deep orange tawny, and the veins broadly black, the hindwings too have a distinct tawny band. It has been reported as being taken in Hayling Island, but the specimen is more probably like my female from the Isle of Harris. The Algerian form, *Janiroides*, which is also said to occur in Spain, has a row of small brown dots in yellow rings on the underside of the hindwings. In the Corsican form, *Nurag*, the male is brown with a fulvous blotch on each wing, and the eye spot surrounded with fulvous; and the female is fulvous, the underside of the hindwings is uniformly brown, without paler markings or black dots.

The egg is yellowish-white with brownish markings. It is globular, and has lines on its surface like the meridian lines on a geographical globe, and a pretty scalloping at the top that gives a flower-like appearance to that portion.

The caterpillar is of an apple green colour, with a darker dorsal line, and a yellowish white stripe on each side, and white anal points. It is covered with roughish looking warts, which emit short hairs. It feeds on grasses of various kinds, preferring the soft meadow grasses to the coarser species.

The chrysalis is suspended by the tail to a blade of grass, but often so slightly that it falls to the ground. The shrivelled skin of the caterpillar remains, enveloping the tail of the chrysalis, and supporting it. The chrysalis is stout, with two little horns on the head; the tail ends in a short, stout sword spike, on the tip of which are a few straight feeble bristles. The colour is green, with some brown spots and lines.

Two species of parasitic Hymenoptera have been bred from it, namely, *Ichneumon reaptermis* and *Apanteles nothus*.

This butterfly begins to emerge at the end of June, and continues on the wing for some time. Specimens may be seen even as late as the middle of September, and during the greater part of this time the female may be noticed laying her eggs. Near the railway station at Ventnor, in the Isle of Wight, I captured some specimens in 1866, on the 11th of October, and at Dover they have been seen as late as October 29th. They evidently belong to a second brood, as the specimens are beautifully fresh. The eggs are laid singly on the grass blades, and hatch in about a fortnight. The caterpillars

feed slowly for a short time, and then retire for hybernation. With the warm weather of May it comes from its retreat, and becomes full-fed by the end of the month or early in June. It is seldom seen in the day, as it feeds by night, when it may be easily found with the aid of a lighted lantern, or a sweeping net. It remains in the chrysalis state three or four weeks.

Hipparchia janira abounds everywhere in grassy places throughout Europe except in the Polar regions, in those portions of Asia bordering on Europe, and in Northern Africa. It does not occur at any great elevation above the sea.

It is the commonest of all our British butterflies, and is found everywhere, except on high mountains, and the Orkneys and Shetland Isles, and perhaps Caithness and some of the Hebrides. Mr. Knapp, the author of the pleasing "Journal of a Naturalist," notices that it appears but little affected by the diversity of seasons, being equally copious in damp and cheerless summers, as in the driest and most arid ones. Indeed in 1826, which was exceedingly parched, the number of these butterflies was so great as to attract the attention of different persons. In 1867, it was rare in the Rannoch district.

It has a peculiar habit, in a stormy summer, of forsaking the grass at evening, and retiring to roost amongst the branches of oaks and other trees in large numbers. The following morning it returns to the grass.

It was first described as a British species by Dr. Christopher Merrett, in his "Pinax," 1667.

Lewin, in his "Insects of Great Britain," 1795, writes "The female lays her eggs, not fixing them to any particular plant, but dropping them here and there on the earth. The caterpillars conceal themselves at the bottom of the grass when young, and there feed; as they advance in size, they venture out in the evening, and feed more generally. I have no doubt but this cautious manner of feeding is their great protection from their enemies—the ichineumon fly and birds. This will in some measure account for the smooth caterpillars, and those with little hair on them, being so seldom seen, as they mostly conceal themselves in the day-time. Some of the caterpillars, which have grown fast, and were produced from eggs laid early in the season, change to chrysalis at the end of the summer, and will sometimes appear on the wing late in the autumn."

HIPPARCHIA TITHONUS.

Hedge Brown.

TITHONUS, Jann. Titho'nus, the husband of Aurora, the fair and beautiful messenger of the approaching sun, fabled to have been transformed by her into a grasshopper.

The forewings are of a fulvous colour, with a dark brown border, the base being also slightly clouded with brown, and near the tips is a black eye-like spot, with a couple of white dots inside. The hindwings are of a dark brown with a fulvous band across the middle, and a white centred black spot near the anal angle. The underside of the hindwings is of a golden brown at the base and margin, with an irregular waved greyish buff band running across the middle, and a patch of the same colour near the outer angle, and a row of white dots. The size of these dots, as well as their number, varies in different specimens. The width across the wings varies from one and a half to a couple of inches. The male is distinguishable from the female by its slightly smaller size, more obscure colouring, and by having a broad brown oblique patch, extending from the inner margin to beyond the middle of the forewings.

Varieties are scarce, and none have been named. One of the most extraordinary is in the collection of Mr. Stevens. It is a female, and of the usual coloration, except that the dark border is replaced by one of pale drab, into which the fulvous of the centre portion of the wing is gradually shaded. Mr. Bond has a male, from the New Forest, with the fulvous portions of all the wings changed to pale drab, and females of the same character are in a few other collections.

The egg is cylindrical, standing on end, the top flat, the sides with sixteen ribs separated by wide grooves. At first it is of a very pale yellow, but just before the caterpillar is hatched, it becomes pale purplish with dark markings.

The caterpillar is of a bright green or else of a pale stone colour, with a dark reddish dorsal line widening on the middle segments; a white sub-dorsal line interrupted at each segment; and a white spiracular line, bordered above with brown and shading into the ground colour. The whole body, head included, is closely set with fine short pale bristles; the oval flap with two short spines pointing backwards. It feeds on *Poa annua*, *Dactylis glomeratus*, and other common grasses.

The Chrysalis is suspended by the tail to a blade of grass. It is short and rather thick, and is of a very pale green, or of a pale drab colour, with numerous black lines and markings. The head ends squarely, whether looked at sideways or from above; viewed from below the corners are angulated almost like two little horns; the shoulders of the wing cases are also sharply angulated.—(Rev. J. Hellins).

Two species of parasitic Hymenoptera have been bred from it, namely *Rhagas tristis* and *Apanteles nothrus*.

The butterfly emerges from the chrysalis about the middle of July, and continues on the wing for a couple of months.

The egg is laid on blades of grass in July or August. The young caterpillar emerges in about a fortnight, and feeds very slowly for a while, retiring to hibernate among the grass stems near the ground. It may be found again in May, or even in April, at dusk or after dark, by the aid of a lighted lantern, and is full-fed in June, when it turns into a chrysalis, in which state it continues for three or four weeks.

The little section *Pyronia*, to which *Tithonus* and a couple of other species belong, is principally located in South-western Europe. This species is the commonest and most widely distributed over Europe and Western Asia, but is absent from Scandinavia, as well as the greater part of Eastern Europe. It is generally distributed throughout England, frequenting hedgerows and bushy places, but not open fields like *Janira*. In Scotland it is local and not common, being recorded from Kirkeudbright, Perthshire, and the west coast of Rosshire. It apparently does not occur in the Isle of Man, and is not generally distributed over Ireland.

Dr. Merrett briefly described it in his "Pinax, 1667."

James Petiver, in his "Papilionum Britannicæ Icones," published in 1717, states "that it is seen about hedges in August."

Lewin, in his "Insects of Great Britain," 1795, informs us that "*Tithonus*, is a common species, and frequents the sides of hedges and the environs of woods, when on the wing."

Haworth, in his "Lepidoptera Britannicæ," describes it under the name of *Pilosella*, Fabricius.

SUB-GENUS ENODIA.

Hubner.

This sub-genus or section was formed by Hubner for the reception of *Hyperanthus*, which differs from the preceding by the hindwings not being denticulated, and by having very hairy and elongated palpi. There is also some difference in the situation of the second branch of the post-costal vein of the forewings.

HIPPARCHIA HYPERANTHUS.

The Ringlet.

HYPERANTHUS, Linn. Hyperan'thus, probably a typographical error for Hyperanthes, a son of Darius, who fell at Thermopylæ.

This plain-coloured butterfly varies in the expanse of its wings from one and a half to a couple of inches. The upper surface of all the wings is a very dark brown or almost black, without any shade or markings, sometimes with

one or more ocellated spots, which are small and faint in the male, but larger and more conspicuous in the female. On the underside, the ground colour of the wings is rather paler, but uniform, and there is a row of white centred black spots yellow rings, or ocelli, near the hind margin. The underside varies greatly in the size and number of the ocelli.

In his "Illustrations of British Entomology," J. F. Stephen's gives the following varieties:—

Var. *b*. Anterior wings beneath with three very large ocelli, posterior with five; several on all the wings sesquialterous, or having smaller ocelli attached.

Var. *c*. Wings ocellated as in type, but the ocelli large and conjoined.

Var. *d*. Wings ocellated as in type, but the ocelli very minute.

Var. *e*. Ocelli in number as before; the smaller or hinder ocellus on the anterior wings bipupillate, the inner one on the posterior wings nearly obsolete.

Var. *f*. Ocelli entirely obliterated; in lieu thereof three snow-white spots on the anterior wings beneath, and five on the posterior.

Var. *g*. Anterior wings with three ocelli beneath, posterior with four, the one at the anal angle being obliterated.

Var. *h*. Anterior wings beneath with three ocelli; posterior with four white spots.

Var. *i*. Anterior wings with three ocelli beneath; posterior as in type.

Var. *j*. Anterior wings as in the last; posterior with four ocelli, the inner one being obliterated.

Var. *k*. Ocelli in number as in the last, the anterior costal one on the posterior wings wanting.

Var. *l*. Anterior wings with two ocelli beneath, posterior with three; the costal and anal ones wanting.

Var. *m*. Ocelli obliterated; anterior wings beneath with two white dots; posterior with four.

Var. *n*. Anterior wings with a single ocellus beneath, posterior with five.

Var. *o*. Anterior wings as in last; posterior with four ocelli, the anal one obliterated.

Var. *p*. Anterior wings same as last two; posterior with three ocelli as in var. *l*.

Var. *q*. Ocelli obliterated; anterior wings with a single minute white dot beneath, posterior with four.

Var. *r*. Ocelli obliterated; anterior wings immaculate; posterior with three minute white spots.

Exclusively of the above, there are numerous intermediate varieties in the

magnitude of the respective ocelli; and the wings are frequently differently ocellated on the left and right sides. Mr. Stephens goes on to add "that the above are all that he possesses, and has had an opportunity of examining."

The form in which the eyed rings are represented only by the white dots of the centres, is called *Arete*, Müll., or else *Polymeda*, Hubner; and in Dr. Staudinger's large catalogue the only locality given for it is the Valley of the Amoor, but it is met not uncommonly at Dover, and it also occurs in Hampshire, Dorsetshire, Yorkshire, and other parts of England. Mr. Wailes had a specimen without any spot whatever, taken in Durham, Mr. Robson has another; and Mr. Kirby has one, taken in Germany, in which the outer half of the fore-wings, and the edges of the hind-wings, are grey instead of brown. These varieties are extremely interesting, as showing how a character, formerly supposed to be of specific value, can be modified, and indeed entirely lost, without inducing the slightest doubt as to the propriety of uniting all these dissimilar individuals under one specific name.

The egg is of a yellowish white colour at first, but soon turns to a pale brown, the shell remains clear and shining. It is dumpy, conical in shape, with rounded top, and very faintly reticulated.

The caterpillar is of a pale straw colour, with a dark brown dorsal line, which is broadest and most distinct at the anal segments, gradually narrowing and becoming fainter as it approaches the head. It is spindle shaped, and covered with roughish warts, which emit short white hairs. It feeds on *Triticum repens*, and other common kinds of grasses.

The chrysalis is short and very obese, with a rather rounded head; and of a pale brown colour, with spots and markings of a darker shade. It is suspended by the tail to the lower part of a blade of grass, but often so slightly that it falls on to the ground, where it remains.

The butterfly emerges from the chrysalis in the early part of July, and continues on the wing until August. The egg is laid singly on the grass stems, and hatches in about fourteen days. The young caterpillars feed very slowly during the autumn, and conceal themselves at the roots of the various grasses on which they feed, but crawl out again and recommence feeding very early in the year, and by the end of March are often half-grown. They feed during the night and cannot readily be found, unless diligent search be made with a lantern, among the long grasses so commonly growing along the hedgerows and ditches, more especially in the neighbourhood of woods. Towards the end of June they attach themselves by the anal claspers to a slight web, and hanging with the head downwards: are transformed into chrysalides.

The Ringlet is common in woods throughout Europe, except the extreme

north. It occurs also in Asia, but only in some of the districts bordering on Europe. It is widely distributed in the British Isles, but as it frequents woods and wooded districts, is rather local, and has not been observed in the Isle of Man. In Ireland it is very local, but occurs very abundantly in Galway. In Scotland it does not occur in the more mountainous parts. Dúnegan in the Isle of Skye, is the most northern locality in Britain at present known for the species.

It is first described as a British species in "Merrett's Pinax," published in 1667.

In his "Papilionum Britannicæ Icones," 1717, Petiver records it as rarely appearing before August, and mostly near rivers.

In Lewin's "Insects of Great Britain," 1795, we read: "Caterpillars that feed on the leaves of trees, shrubs, or bushes, are readily discovered by beating the boughs into a sheet; but those that feed on herbs, or grasses, that grow close to the surface of the earth, are not to be obtained but by the most diligent search under the cover that the leaves or roots afford them; and as the caterpillars in this section do not keep together, but are dispersed, and live in a solitary manner, they are but rarely to be met with. This is a common insect, frequenting the skirts of woods, and the sides of hedges."

SUB-GENUS CÆNONYMPHA.

Hubner.

This genus or sub-genus includes between twenty and thirty species, the greater part of which are European, two occurring in Great Britain.

They are all of a pale drab or tawny colour, and comprise the smallest of the family. All the three nervures of the fore-wings are dilated at the base, and the antennæ are slender, with a long and fusiform club. The middle pair of tibiæ are as long as the tarsi. The caterpillars differ from those of the other sub-genera in being completely glabrous and shining. A couple of species, *Hero* and *Arcanius*, have been erroneously recorded as British.

CÆNONYMPHA TYPHON.

Large Heath.

TYPHON, Rott. Ty'phon, last of the sons of Terra, a giant on whose shoulders grew an hundred serpents' heads.

This is an exceedingly variable butterfly, especially on the underside, and as may be supposed, two or three species have been made out of one; permanent varieties seeming, as in the case of *Polymmatius alexis*, to belong to particular localities.

The species varies in the expansion of its wings from an inch and a half to an inch and three-quarters. The upper surface of the wings of both sexes is of a brownish-white, the base being darker, and the fringe of a pale grey. There are rudimentary eyed spots near the hind-margin of the hind-wings, and also a rudimentary one near the tip of each fore-wing. The underside of the fore-wings is somewhat similar to the upper, except that the eyed spot is distinct, and that there is a distinct white bar near the spot. On the underside the hind-wings are of a silvery grey, with an irregular interrupted white bar across (the interruption forming the ground of the formerly supposed specific distinction; and there is a row of small eyed spots near the hind-margin, varying in number from two, to six or even seven. Sometimes there are as many as five on the fore-wings. The obliteration of the ocelli also varies much, in some specimens they are replaced by pale fulvescent or whitish spots, and in others they are almost obsolete. Again many specimens have the upper surface bearing very distinct ocelli, which vary in number from two to six. This form is the *Laidion* of Borkhausen, and is the same as that called *Typhon* in Kirby's "European Butterflies," and *Davus* in Newman's "British Butterflies"; and is the one found in Ireland, and most most generally distributed in Britain, and on the Continent of Europe.

Var. *Polydama*, Haw. Differs from the preceding in the white bar across the under surface of the hind-wings being continuous, instead of interrupted. I have Haworth's original specimen, taken in Yorkshire by Mr. Watson.

Var. *Isis*, Thunberg. It is of a very much lighter shade, with the ocelli entirely wanting, or only traceable as pale dots, and the transverse bar is little different from the ground colour. It is the Lapland form, but occurs with the type in the Orkneys and the north of Scotland.

Var. *Philoxenus*, Esp., Manchester Ringlet. Is of a much darker hue *Laidion*, and the eyed spots are much larger and more distinct. The white transverse bar is generally continuous like that of *Polydama*, but sometimes interrupted like that of *Laidion*. Four, five, or even six distinct black, white centred spots, in pale rings, are on the underside of the hind-wings, and two or three on the fore-wings, and there is a like number on the upperside. This form is the *Philoxenus* of Esper, is called *Davus* in Kirby's "European Butterflies," and *Rothliebii*, in Newman's "British Butterflies," and occurs commonly on Chat Moss, near Manchester, and other parts of Lancashire; Thorne Moor, in Yorkshire; and other localities in the North of England. Dr. Buchanan White gives Cloak Moss, near Dalbeattie, as the only Scottish locality. It occurs on the Continent of Europe, but is probably only found in low-lying districts, and the caterpillar feeds on *Rhynchospora alba*, a plant which is often not a native of the localities frequented by *Laidion*. Some

specimens from Cumberland appear to be somewhat intermediate between *Laidion* and *Philoxenus*.

Professor Westwood remarks on these different varieties, that in *Davus* all the markings are complete, distinct, and unclouded; in *Polydama* they are somewhat paler and less defined; and in *Typhon* the broad band is divided into two irregular marks, while in further varieties some of the marks disappear altogether, and all are fainter. Also that *Davus* has the little rings always more or less defined on the upper surface, and is of a dull brown colour, with a slight inclination to grey, the darker parts inclining to green. *Typhon* and *Polydama* have the little rings very slight, and in some instances altogether wanting on the upperside, whilst also the ground colour is somewhat paler, and inclining to tawny, and on the underside all the markings are paler and less distinct. The females are generally lighter than the males, with the ocelli on the upper surface larger and more distinct, and have a pale blotch on the upperface of the hind wings.

The egg is barrel shaped with the sides convex and delicately ribbed, and is of a pale straw colour very faintly blotched with pale brown.

The caterpillar is of a bright green, with a dark bluish-green dorsal line edged with pale lemon yellow, pale yellow sub-dorsal and spiracular lines, and brown spiracles, the caudal fork being tipped with pink. When full grown, it attains to an inch in length, the head being globular, and the body tapering towards the anal forked extremity. It feeds on *Rhynchospora alba*, and also on the various kinds of cotton grass, *Eriophorum*. The habits of the caterpillars differ much from those of the allied genera in being particularly active and lively, travelling much over their food-plant, an all-wise provision, enabling them to escape the inundations to which they are liable. (Buckler's larva of British Butterflies.)

The chrysalis is suspended by minute caudal hooks from a white silken web spun on the edge of a leaf of the food-plant. At first it is of a bright green, but, before the butterfly comes forth, changes to a dark brown.

The butterfly is on the wing from the end of June to the beginning of September. The egg is generally laid in July, and the caterpillars, as is usual with those of the family, hibernate. *Cænonympha typhon* is common, though somewhat local, on mosses and moors in Northern and Central Europe, Northern Asia, and Northern America. It has not been observed in the Isle of Man, but is extremely abundant in the South-west of Ireland, and in bogs of Connemera. In Britain, it ranges from the Shetland Isles to Chartby Moss, in Staffordshire. It is common at Rannoch, and in other Highland districts, and occurs on the Scotch mountains at an elevation of upwards of two thousand feet. It is also found in North Wales, and has been reported

from North Devon. The variety *Philoxenus* appears to be confined to the mosses of Lancashire and the neighbouring counties. Both *Laidion* and *Philoxenus* occurs in Yorkshire; for in the Entomologist for 1840-2, is the following paragraph, "I took *Hipparchia davus* at Thorne Moor, but wasted; and I had *H. typhon* given me from Cottingham, near Hull. In visiting the locality I find it differs from Thorne, where the original *Davus* occurs; Thorne Moor is mossy or spongy, but the Cottingham locality is reedy, as are all the spots where I found *Typhon* in Scotland: I consider them only local varieties."—J. C. Dale, August 13th, 1841.

The Cumberland specimens appear to be somewhat intermediate between the two; and in one of my specimens the white bar is wanting on the under-side of the fore-wings, therefore resembling the next species, *Pamphilus*.

In the Linnæan cabinet were four or five specimens ticketed "*Arcanius*," the last of which is set on the reverse side, and to it is a ticket with "*Angl. Hudson, rariss*" on it. It certainly is not *Arcanius* but *Typhon*; dark brown with scarcely any ocelli. It was probably taken in Wales by the celebrated botanist Hudson.

The variety *Philoxenus* was first recorded as British in Lewin's "Insects of Great Britain, published in 1795, under the name of the Manchester Argus—*Hero*, Linnæus,—with the following paragraph: "This butterfly was scarcely known in England till lately, when a gentleman found several in a moorish or swampy situation near Manchester; and from their local attachment to the same place, he takes them on the wing every year in July. The fly I have figured is from one in Mr. Francillon's magnificent collection of foreign and British insects." Donovan, in his "Natural History of British Insects," vol. vi., published in 1797, records it as "a local species: it is very abundant in some marshy parts of Lancashire; but we have not learnt that it has been taken in any other part of the kingdom. Many of the curious in London are particularly indebted to Mr. Phillips, of Manchester, for enriching their cabinets with *Papilio hero*, for though it is a plain insect, it is esteemed for its rarity, few entomologists having travelled into that part of the country to collect insects."

Both *Hipparchia arcanius* and *hero* are figured by Curtis, in his "British Entomology," from specimens said to have been captured by Mr. Plasted, on the borders of Ashdown Forest, Sussex; but as he also stated that he took *Chrysophanus chryseis* in Ashdown Forest, and *Acontia catena* at Brixton, Surrey, and also *Acontia calorii* in the neighbourhood of London, he cannot be looked upon in the character of a trustworthy personage.

Haworth, in his "Lepidoptera Britannica," records *Davus* from the museum of Jones, and as inhabiting the marches of Lancashire, near Manchester; and

JANUARY, 1887.

PART LXXXV.

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Can anyone supply me with the present address of Mr. Roper Curzon, or if he sees this will he kindly communicate?

Will members send me a marked list, or at any rate their *desiderata* in Butterflies. I could then perhaps print here some of the species wanted, so that members might know what to collect.

I must call particular attention to Rule 3, "*In lepidoptera those 'common everywhere' shall not be sent, except there be some local or other peculiarity about them. All specimens must be well set and in good condition, except that 'types' of rarities may be sent.*" The continued inattention to this rule must result in the exclusion of offenders from the club. Many would be glad to have even a poor specimen of *Pronuba* var. *Innuba*, or *Orbona* var. *Curtisii*, but no one wants an illset poor specimen of the type.

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March 10th.—Paper by Mr. E. Step, "Mosses."

,, 24th.—Microscopical Evening.

NOTICE OF REMOVAL.—This Society having removed to more commodious rooms in the "Bridge House," London Bridge, S.E., all communications to be addressed to Mr. H. W. BARKER, Hon. Sec., as above.

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AND THEIR

NAMED VARIETIES.

BY

JOHN E. ROBSON and JOHN GARDNER.

(Dedicated by Special Permission to the Members of the Haggerston Entomological Society.)

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