THE

ENTOMOLOGIST'S ANNUAL

NOTICES OF THE NEW BRITISH SPECIES

WITH A SELECTION OF OTHER PAPERS

Second Edition

Instructions for Collecting, Preserving and Arranging Insects, and an Address to the Young Entomologists at Eton, Harrow, Winchester, Rugby and at all other Schools

LONDON

JOHN VAN VOORST, PATERNOSTER ROW.

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[illegible] Anthrocera Minos [illegible] Spaelotis Vallesiaca [illegible] ubolia mæmata
[illegible] tutella 7 Nepticula Weaveri
[illegible] armatum [illegible] ythis depressus

THE

ENTOMOLOGIST'S ANNUAL

FOR

MDCCCLV.

COMPRISING

NOTICES OF THE NEW BRITISH INSECTS

DETECTED IN 1854.

LEPIDOPTERA. By the Editor.
HYMENOPTERA. By Frederick Smith.
COLEOPTERA. By E. W. Janson.

EDITED BY

H. T. STAINTON,

AUTHOR OF "THE ENTOMOLOGIST'S COMPANION."

Second Edition,

WITH CONSIDERABLE ADDITIONS,

INCLUDING

Instructions for Collecting, Preserving and Arranging Insects, and an Address to the Young Entomologists at Eton, Harrow, Winchester, Rugby, and at all other Schools.

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PREFACE TO THE SECOND EDITION.

THE enthusiastic reception which "The Entomologist's Annual" has met with, from all classes of Entomologists, not only renders its continuance in future years a matter of certainty, but has rendered it necessary to bring out a Second Edition of that "for 1855."

Of course, if the demand that has arisen for the book could have been foreseen, a larger "first edition" would have been printed, but, starting with so few *data* to go upon, I was as much mistaken, in the probable success of the undertaking, as were the originators of railroads respecting the probable speed to be obtained by locomotive engines.

The object of this Annual is to record systematically the discoveries of each year. Every year new species are being added to our Fauna, and that these should be *systematically* chronicled is, in a science so vast as Entomology, of very great importance. That this may be efficiently done, it is essential that the writer, on each group or order of insects, be selected from those best acquainted with the subject.

The present volume contains only three Orders: the LEPIDOPTERA, which, with the kind assistance of Mr. Doubleday and Mr. Douglas, I have worked up myself; the HYMENOPTERA, for which no more able and thorough writer can be found in England (*if* in Europe) than Mr. Frederick Smith, one of the Assistants in the Zoological

Department of the British Museum; and the COLEOPTERA, which have been most carefully elaborated by Mr. Janson, to a degree which has elicited the warm admiration of such celebrated Coleopterists as Mr. Waterhouse and Mr. Wollaston. In future years I hope to be able, as a greater amount of talent becomes attracted to the ample field of Entomology, to introduce gradually other orders of insects, till ultimately the entire cycle of Entomology may be comprised within this portable little book.

Whenever the amount of scientific matter for the Annual is sufficiently limited, to allow of chapters of an amusing nature, relating to Entomology, being introduced, I shall certainly not fail to avail myself of the opportunity of adding some "dulce" to the "utile," satisfied that thereby the *usefulness* of the work will in reality be increased. Many who would hesitate to get the Annual, if all dry and scientific, may be tempted by such amusing chapters, and so be gradually induced to become readers of the more scientific parts, whereas it might otherwise only be sought after by those well advanced in Entomology, and therefore less in need of it.

In preparing the Second Edition, I found myself able to expand the volume a little, and have therefore introduced "An Address to young Entomologists at Eton, Harrow, Winchester, Rugby, and at all other Schools," and "Instructions in collecting and preserving *Lepidoptera* and *Coleoptera*," which will, I hope, be found useful to those for whose benefit they are intended. I hope that this increase in the size of this edition will not render the purchasers of the first edition dissatisfied with their bargain; as these chapters are quite elementary, they are comparatively useless

to the "old hands," yet, if any one feels himself aggrieved in this matter, if he wishes it, I shall be happy to give him a copy of the second edition in exchange for his copy of the first.

Several letters which I have received from new Correspondents concerning "The Annual," contain such useful suggestions, that a few extracts will not be out of place here.

"Your estimate of the number of Entomological workers is rather amusing, and I would suggest to you to try and gather materials for a paper on *Entomological Statistics*, as it would really be very interesting; and if you will only get some correspondent in every town to send you the names or numbers of all he knows devoted to studying or collecting in any division of Entomology, instead of your estimate of *four hundred* only, I am disposed to think it would be nearer *a thousand*. But then, I admit, many of these would be found in the humbler classes of society, and *not book-buyers*. As far as my experience goes, Entomologists, especially those 'who amuse themselves with catching insects,' are *far shyer* in declaring themselves than Botanists and other Naturalists; and, if I must speak the truth, are too often *more selfish*, delighting to find anything very rare, but very chary indeed of divulging the secret to any one else. The majority too of collecting Entomologists are *not of a literary turn*, and this tends to prevent *their being known themselves, or knowing what is going on in the literary world*. Thus, I have frequently met with men who had stored up good boxes of insects, of their own collecting, but knew nothing of their classification—merely the common names, 'Mother Shipton,' 'Wood White,' 'Skipper,' &c. &c., but *had not a book on the subject*.

"Indeed, as there are anglers who look only to the *pot*, so there are a numerous set of *collecting Entomologists*, who look only to *the pocket*, and have hardly a spark of true love of science in their composition. This is a sad evil to the systematic and writing Entomologist, who naturally wants readers sufficient to remunerate his publishing outlay but cannot obtain them.

"Your Annual is a move in the *right direction*, but more than this is required. Books on Entomology are far too high in price for the many—I was almost going to say for *any;* and if the thousand collectors, that I estimate there really exist in England, are to be reached, it must be through such half-crown publications as yours, and not in expensive volumes, which few indeed can obtain. I have always been for *extending* knowledge as much as possible, and *increasing the numbers of students;* but this can only be done by descending at first to the comprehension of *the many, who only desire amusement*, and so inducing them to ascend the steep ascent that conducts to the temple of science. Moderate priced publications may do this, as well as monographs of different families, brought out in a cheap way. How few are likely to buy Westwood's book on the Lepidoptera! but if there were *good*, yet *moderate priced* volumes, that *collectors* might be induced to buy, on British Butterflies—British Moths—British Bees—British Coleoptera, or Coleopterous Families, &c. &c., the study of scientific Entomology might be *much extended*. However, it may be well first to ascertain the present number of *practical* Entomologists, and then the problem to solve is to convert them into *readers*."

Another correspondent writes, "would it not be a good plan to have a catalogue of collectors as well as insects.

Every known collector in a district probably knows of several collectors, among the lower classes; and though many through jealousy would be unwilling to give up their names, I hope there are enough liberally minded collectors to counterbalance any such feeling."

Another writes, "most of the books on Entomology are so very expensive as to be out of the reach of common folks —if there could be a cheap book got up on Entomology, written in a plain, simple style, with the latest given name in English and the Latin one in italics, my opinion is, that there would be a great many more books sold, and we should hear of many more Entomologists, and likewise a great many more rare insects being taken. Entomology appears to me to want to undergo a radical reform; there seems great confusion heaped together in technicalities, synonyms, and bad Latin names, not appropriate to their use; in fact there wants a 'Modern Model English Book on Butterflies and Moths, for the Million.'"

Now, with reference to the suggestion to publish a list of Entomologists, I would gladly do this in next year's Annual, if I find that the idea is generally palatable—and it would be well to indicate not only the names and addresses of the parties, but also the order to which they more particularly devote their attention.

As to bringing out cheap systematic works on Entomology I shall be very glad to receive further suggestions, and may be able to give some announcement on the subject in "the Annual for 1856;" with reference to the necessity of writing intelligibly to *the many*, I cannot do better than refer to the following extract from the preface to Newman's "History of Insects."

"Teachers in science are nearly equally divided into two classes;—those who know too much and those who know too little. Those of the first class, overloaded with science, cannot admit the possibility of meeting with readers who have none; and therefore their essays and introductions are so worded that it requires a tolerable proficiency to understand them. The teachers of the second class fall into the opposite error; they curtail, garble and popularize the writings of others without understanding them, forgetful that it requires a consummate knowledge of any science to abridge a work which treats of it ably and at large. The author submits, that both classes are in error; he submits also that introductory works should be written *for* those who know nothing of the subject on which they read, and *by* those who possess, in themselves, some practical knowledge of the subject on which they write." This entirely agrees with my own feelings, that a person must have more skill in order to teach the *unlearned* than would be necessary to teach those who have already made some progress.

It can hardly have failed to have struck the most unobservant that the votaries of Entomology have of late years increased in a rapid ratio; this has become statistically apparent in the recent development of the Entomological Society. It is but a few years since I attended a meeting for the purpose of devising some scheme of extricating the Society from a position of considerable difficulty, it being then 130*l.* in debt, and with an expenditure in excess of its income! Many might have been tempted to despair of recovering the Society from so deplorable an abyss; but John Bull, however fond he may be of grumbling, *never despairs*, and besides it is proverbial that "when things get to the

worst, they begin to mend:" and certainly it was so here—the very difficulty of our position compelled a strict attention to economy and also induced the most energetic efforts to increase the income of the Society; and it happened fortunately that at this very time, for I am speaking of a period no more remote than 1849, the Society had the good fortune to obtain the services of an efficient Secretary of good *business habits* in the person of Mr. Douglas, and however little that may be the general impression among those inexperienced in such matters, it is of vastly greater importance that our Secretary be a good man of business than that he be a scientific Entomologist,—not but what it is advantageous to combine, as in Mr. Douglas's case, the two qualities, but of the two the former is by far the more important qualification, as I had abundant opportunity of ascertaining during my own service as Secretary.

The Society, which in 1849 only numbered 71 Members, has now (including the new class of subscribers) more than double that number; and to all appearance the present number will be again doubled before another six years have elapsed. Commensurate with the increase in the number of members of the Society and *consequently of its funds* has been an increase in the bulk and utility of the Transactions of the Society, which now appear regularly at quarterly intervals.

That this rapid increase in the number of the Members of a London Scientific Society is a strong indication that the votaries of the science which it fosters are becoming generally more numerous, no one can deny, and that a taste for Entomology will yet become still more extensively diffused is a conclusion which few will probably be inclined to dispute; and this Annual hopes that it will be found no mean con-

tributor to a "consummation" so "devoutly to be wished." It aspires to serve as the small end of the wedge, which shall convey to many, who would otherwise have remained ignorant on such matters, a knowledge of what is doing by the Entomologists of this country, and by conveying that knowledge to excite an increased amount of interest in the subject. If space permit, a glance at what is doing on the Continent shall also be introduced another year.

The severe winter of 1854-5 has now passed away, spring has come, and no doubt all Entomologists are already actively engaged. That each may have a successful season is the sincere wish of

H. T. STAINTON.

Mountsfield, Lewisham,
March 22nd, 1855.

CONTENTS.

"Another reason why so many kinds of creatures were made, might be to exercise the contemplative faculty of man; which is in nothing so much pleased, as in variety of objects. We soon grow weary of one study; and if all the objects of the world could be comprehended by us, we should, with Alexander, think the world too little for us, and grow weary of running in a round of seeing the same things. New objects afford us great delight, especially if found out by our own industry."

JOHN RAY, *The Wisdom of* GOD in *Creation*.

THE PURSUIT OF ENTOMOLOGY.

(By the Editor.)

The difficulties of a pursuit not unfrequently deter many from commencing it. After catching a number of Butterflies, and of the larger Moths, in those halcyon school-boy days, the incipient Entomologist pauses, perhaps to consider whether he shall seriously occupy himself with the subject; if he is deliberately to form a collection, that collection must be arranged. Now comes the first difficulty: it is all very easy work, when a lot of gay-coloured insects are caught, killed and set out and placed "any how" in a large box, and the tyro may even proceed further and arrange together those specimens that seem to be alike; but this done, he feels a desire, a pressing urgent desire, for some book on Entomology. When that desire can no longer be restrained, our young Entomologist meets with one of the numerous books written *to sell, not to instruct*, and fondly imagines that he has obtained an infallible guide; he little thinks that he also *has been sold*. He now proceeds, by the help of his new lights, to unravel the mysteries of his tangled collection, and soon discovers the names of some of the most conspicuous; but beyond that he finds a vast mass which, for the present, he must be content to lump together, as unascertained species. One difficulty that soon besets the student is, that the specimen he may have before him may have been a recent addition to our Fauna, and may not have been known to the writer of the

work he has obtained: this uncertainty increases his difficulties considerably. Were he sure that the species was figured or described in the work he is using, he could have continued his investigations, determined to ascertain its name; but uncertain whether he be not, in fact, seeking that which is not there, his search is necessarily carried on with less vigour, and with less prospects of success. Every year new species are being met with in this country, some totally new to science; some which, though common enough on the Continent, had not previously been met with here. With the increasing vigour with which Entomology is pursued—and probably it has twice as many eager votaries as it had twenty years ago—novelties, instead of being fewer in number, as might be expected were the mine nearly exhausted, are actually on the increase, and will probably so continue for several years to come. Besides the species actually new to us, many once of great rarity turn up in some locality in great abundance, or as *Sphinx Convolvuli* did, in 1846, swarm throughout the country. It thus happens that our tyro meets with some insect in great plenty, which his "Index Entomologicus" mentions as "very rare;" and he hastily concludes that he has had some wonderful luck, and is inclined to boast of his captures, till some kind friend informs him that "the insect is now so common, that nobody thinks its capture worth mentioning:" whereat, though he may thank his friend for his kindness, he nevertheless feels a little annoyed—people do not like to discover that their swans are only geese.

The idea of the present work is to supply these two main desiderata: to give systematically notices of all the new species found in this country in the past year, and at the same time to intimate which once rare species had been taken in any plenty. In the present volume, so much space being occupied by notices of the novelties since the last

standard work on the subject, there was not room left for notices of the rare species which have become common, without swelling the book to a size which, by enhancing its cost, would have diminished its usefulness by limiting its circulation.

Entomologists are not drawn from the wealthy, but rather from the working classes; an extra sixpence or two in the price of this book might put it completely beyond the reach of a large circle of Entomologists. An Entomologist is none the less one because he wears fustain, and "labours, working with his hands;" and in very many of this class the innate love of these beautiful objects of creation, the Butterflies and Moths, supplies them with one of their purest pleasures. Should not such tastes and such pursuits be encouraged? An observation, if new, is as important by whomsoever made; and a Spitalfields weaver may supply some important gap in our knowledge, which Oxford and Cambridge put together would fail to elucidate.

To those who have not yet left school, I would suggest that the Midsummer holidays of the school-boy afford opportunities of making Entomological captures, which rarely re-occur in after life. At no subsequent period are they likely to have so much time thrown completely on their hands; hence it is that many of our rarest species have been taken by Entomologists while yet in their teens, and much more would, no doubt, be accomplished by them, if older and more experienced Entomologists would assist the young inquirers with information. Those who *have* acquired information should endeavour to render it as useful as they can, by communicating it to as wide a circle as possible; and, acting on this principle, I am always happy to answer any inquiries addressed to me by young Entomologists.

AN ADDRESS

TO

YOUNG ENTOMOLOGISTS

AT

ETON, HARROW, WINCHESTER, RUGBY,

AND AT ALL OTHER SCHOOLS.

(By the Editor.)

Almost every celebrated follower of Entomology has dated his predilection for that pursuit from his school-boy days; consequently among those who now at school are fond of Entomology, are concealed the Cuviers, the Kirbys, the Erichsons, from whose labours we shall all derive instruction ere twenty years have passed away, and many who still in round jackets and turn-down collars read these lines will, before they are five years older, have materially assisted the writer by their own observations; *such is my firm conviction.* Have not I then a strong interest in increasing, to the utmost in my power, the number of my readers, in urging each individual to increased assiduity and encouraging him to seek information?

The feeling of admiration for butterflies, and a desire to catch them, appears instinctive in almost every child; those who shrink from a beetle and fear a wasp or a dragon-fly, feel no abhorrence at the sight of the butterfly; be it a garden white, a peacock or a nettle tortoise-shell, it is alike admired and pursued; but many may be disposed to imagine that

because all children run after butterflies, all who run after butterflies are children. As a friend of mine, a clergyman, when well advanced in life, while pursuing eagerly some insect, overheard the remark of some uninitiated in his occupation, "Look at that big babby!" and had his object been merely to catch an insect and look at it for a moment as children do, and then let it go again, he might indeed have been styled a "babby," but then he would not have been an Entomologist.

Kirby and Spence in their invaluable "Introduction to Entomology," a work whose excellence is best understood by the fact of it having gone through six editions in this country, and been translated into several foreign languages, endeavoured to show that Entomologists are not to be despised as triflers, and no doubt at the present day many are disposed to accord them a higher rank, but still see two men in one field, the one standing patiently by the side of a stream trying with a rod in his hand to obtain a "glorious nibble," the other with an Entomological net in his hand in full career after a butterfly (perhaps a Bath white), the passers-by will consider that the angler's occupation has in it nothing contemptible, and they will not gape and stare at him every time he moves, while he who is in pursuit of his *Daplidice* will be regarded with very different feelings, and not a few jokes probably cracked at his expense.

Many of you whom I more especially address are, perhaps, considered by your friends and relatives as following a foolish pursuit, and you are told you are wasting your time and neglecting your studies; the latter I hope is not truly the case, for I advocate that no duty should be neglected for the sake of pleasure, and you will find that you will enjoy your recreation none the less for working hard whilst at work.

All Entomologists begin (I believe without exception) with being collectors of insects, and, therefore, he who is

simply a collector of insects is not on that account to be dispised. We do not see the apple trees produce fruit at once, but first comes the bud, then the blossom, and afterwards the fruit is formed; so the collector of insects, his first desire is simply that of getting—

"Cecropias innatus apes amor urget habendi."

But even in pursuit of that object he cannot but notice that some modes of getting succeed better than others, that he finds certain insects in certain places, and so by degrees a habit of observation is formed; and when desirous to add to his own observations those of others, he begins to consult the writings of other Entomologists, he soon discovers that the observations he had made and which struck him as so profoundly novel, had already been recorded more than a hundred years ago; and here immediately comes an inducement for an Entomologist to pursue zealously his school studies. All Entomological books are not written in English. To read the memoirs of Réaumur and De Geer it is necessary to know French, and a facility in reading Latin and German will also be found no mean advantage. The Entomologist, therefore, immediately finds a personal interest in prosecuting his studies of these languages. Instead of saying, as many others might be tempted to say, "Of what use will Latin be to me?" he exclaims, "I shall then be able to read Haworth's Lepidoptera Britannica;" instead of despising French as a language "good enough for girls," he is anxious to get on with it that he may have no difficulty in reading Réaumur and De Geer. Now, though it be quite true that these studies ought to be pursued in good earnest from a sense of duty, yet when we can do so, it is surely desirable to give the scholar a personal interest in the steady prosecution of his studies.

The philological skill which is used in deciphering some

obscure passage in Xenophon or Thucydides, may later in life be of use in enabling an Entomologist to unravel some obscure description; indeed the classical student soon gets to learn that to ascertain an author's meaning, the only way is to familiarise yourself perfectly with all the author's modes of expression. Individuals rarely use the same combination of words to express exactly the same ideas, and an author's meaning is best elicited by a reference, not to a dictionary, but to himself.

An Entomologist soon finds that the field before him is *so vast*, that even if, as is now generally the case, he confine himself to one order of insects, for him to catch a sufficient quantity of each species to supply even his limited circle of young entomological acquaintance is no pursuit for an idler; indeed he cannot long have pursued this branch of Natural History without noticing that if, as the late Dr. Arnold remarked, an early separation is observed at school between the idlers and the workers of the community, that he has already taken his election among the latter class.

Want of useful employment for their time is the great bane of the mass of mankind—"for Satan finds some mischief still for idle hands to do"—any one who can early initiate the young to some attractive amusement, which shall at the same time afford them useful employment, becomes a benefactor to his race. Now, of all branches of study, Entomology is perhaps the most attractive to the young: one great advantage is, that it is a pursuit which combines the healthful exercise of the sportsman with no small amount of headwork at home; and with this advantage over any pursuits in which the out-door exercise and in-door study are totally disconnected, because here each reacts upon the other, the Entomologist carefully examines a specimen under the microscope to ascertain to what group it should belong, and during his next walk he takes pains to observe the habits

of the species when at large, in order to be able by analogy to trace with what other species it has affinity. He who aims to be a good Entomologist will also not omit to pay his respects to "Flora," for most insects being vegetable feeders, an acquaintance with Botany is very essential. Now Botanists are a much more numerous class than Entomologists, and the pursuit is one looked generally on with more respect; but inasmuch as insects are endued with volition and powers of locomotion, they claim a higher place than plants in the kingdom of Nature, and those who make their study the recreation of their lives will continuously reap benefits from it, which at first they little anticipated.

And in the first place they will soon discover practically the littleness of their knowledge,—and what more conducive to check presumption or conceit? he who penetrates but a little depth below the surface of any one branch of science, soon finds before him numerous facts and ideas of which, before he penetrated to this extent, he had no conception; reasoning therefore by analogy he concludes that all other branches of science are equally pregnant with interesting results to reward the active investigator. Perhaps he had nearly begun to conclude that he knew "pretty nearly every thing;" now he finds that even in this one branch of science what he does *not* know is infinitely more than what he *does* know, so that he will feel inclined to exclaim with a celebrated living Entomologist*—

"If Entomology became any one's daily and favourite occupation, there would be matter enough for observation, investigation, correction and discoveries for centuries of years, without the least sensible exhausting of the object,"—and if Nature herself is thus infinite, what must be her Creator!

* Herr C. A. Dohrn, President of the Entomological Society of Stettin.

And in the second place, the Entomologist will deduce but little moral from his observations if he do not gather from them strong reasons for a continuous cheerfulness: let him but walk on some sunny summer's morning by the side of some verdant hedge, he will observe that insect life is displayed before him, not singly or in dozens, but in hundreds and thousands, and each of these insects has a part to play in the great economy of Nature, each is enjoying its short life, and is fulfilling the end of its creation. It is impossible for any one seriously to reflect on the continuous happiness enjoyed by these atoms of the animal kingdom, without inquiring whether man may not even here participate in it. The cause of half, nay, of nine-tenths of our troubles, is that we are disposed to grumble and be peevish if everything does not fall out exactly as we anticipate. The Entomologist will act wisely if, taking lessons from insects, he endeavours to increase his own happiness by being *contented* in whatever position and in whatever circumstances he may be placed; if we hold that "whatever *is*, is right," then the sooner we reason ourselves into acquiescence in that which *is*, the sooner do we derive the benefit of a uniform serene cheerfulness which prevents any apparent annoyance being a real trouble to us; and the feeling described by St. Paul, "I have learned in whatsoever state I am therewith to be content," does not in the slightest degree interfere with our energetically endeavouring to effect some object. It does not at all prevent our acting with a view to the future; we only admit cheerfully that which no exertions of ours can alter, that which *has come* to pass. An Entomologist may strive earnestly to discover some particular species, may tax his ingenuity and spend a vast amount of time, but if he still does not succeed, though he may not relax his efforts in the least, he will, if he has profited by his studies, abstain from all feelings of discontent; he will not be disposed to grumble

at his hard fate, and deem himself an ill-used individual, but he will be inclined to laugh at his repeated failures, and amuse himself with making good tales about them.

Now if the Entomologist learns to be cheerful, and learns not to be conceited, no one can tell him that his pursuit is a useless one,—but do I recommend every one to become an Entomologist? No, there are other branches of science as worthy of study as Entomology; it would not do to neglect them, but I may wish that there were more Entomologists; and there is no doubt that it would be a great benefit to themselves, and to all their acquaintance, if all those who are now destitute of any scientific occupation were to turn their attention to Entomology; nor let it be for a moment imagined that I recommend any one to devote his *whole time* to Entomology. If it be made the *business* of life, some other occupation must be sought for *recreation;* you cannot engage the whole day in one uniform occupation without feelings of weariness and irksome monotony being induced; follow your business whatever it may be with energy during the full time allotted to it, but after business hours, instead of dozing before the fire-place, or doing "nothing at all particular," pursue some scientific study in a methodical and business-like manner, in short—"Take a pleasure in your business, and make a business of your pleasure."

But I fear I am preaching too long a sermon to secure the unflagging interest of my younger readers, so I will endeavour to direct their attention to some points more immediately practical. I will presume you have each of you been collecting for a year or two, and have obtained a tolerable collection, but no doubt you are puzzled to get some of your specimens named, and as there is no royal road to Entomology, any more than to any other branch of learning, to name a collection of insects is not an easy matter. Many is the inquiry that I have had for some work on Entomo-

logy, "with good coloured figures of all the species, and with good descriptions." Such a book would be cheap at £100; *there is no such book*, nor do I anticipate there ever will be one possessing such qualifications. On several orders and groups of insects we possess no systematic British work, but for *Lepidoptera* we have "Stephens's Illustrations of British Entomology," and for *Coleoptera*, "Stephens's Manual of British Beetles;" and faulty as both works have long since been ascertained to be, they have not hitherto been superseded by any later works on the same subjects, and however awkward it may be to use a book as an authority which we are well aware is no authority, we must use such tools as we have, and where that cannot be selected which is actually good, we take that which is the best, remembering that "parmi les aveugles un borgne est roi."

But no doubt I shall be asked are there figures in these works. In the "Illustrations" there are a few, in the "Manual" none. Now my readers are probably more anxious for a book full of figures, than for one containing only descriptions. About twenty years ago a work was projected for figuring all the British *Lepidoptera*, and it did figure all the species known at that time. I allude to Wood's Index Entomologicus. This work, from the facility with which it enabled isolated collectors to name their specimens, has probably contributed more to promote the study of the British *Lepidoptera* than any other work; the figures of many of the species are excellent, and, except in some of the obscure groups, and the *Micro-Lepidoptera*, there are few figures which may not be easily recognized. Unfortunately, since its publication the progress of the science has led to the adoption of an improved nomenclature, more in accordance with that on the continent (for twenty years ago an insect not unfrequently bore one name here, another in France, and a third in Germany, so that the Entomology of one country

was an "unknown tongue" to the inhabitant of another), and the result has been, that if the collector finds that his insect is fig. 242 of Wood, and consequently *Hadena ochracea*, he has then to find by what name *Hadena ochracea* of Wood is now known; for which purpose he must refer to the index of Stephens's Museum Catalogue of British Lepidoptera. It was to supply this difficulty, a great and increasing one, that a new edition of Wood's Index Entomologicus has lately been brought out at a considerable reduction of price, and with the nomenclature carefully revised: but the figures are not as well coloured as the original edition, and those who can meet with the original at book stalls will do well to secure the prize.

Humphrey's and Westwood's British Butterflies and British Moths is a work which, from being showy and cheap, is tolerably well dispersed amongst Entomologists, but the figures are far inferior to those in Wood, and it will rarely enable a collector to name any but his most conspicuous species. It is true some species are figured in it, not known as British at the time of the publication of Wood, but these have been included in a supplement to Wood's Index Entomologicus, published last year, and which for the small price of 12*s.* 6*d.* contains 180 figures.

Lately there has appeared a revised and *much improved* edition of Humphrey's and Westwood's British Butterflies, the plates to which are entirely new, and only those species are in it admitted as British which are adopted as such by Stephens in his Museum Catalogue of British Lepidoptera. The title of this last and best work on our butterflies is "The Butterflies of Great Britain, with their Transformations, delineated and described by J. O. Westwood."

But even the fortunate possessor of several works on Entomology will still find himself at a loss to name many of his specimens; yet there are several Entomologists, who,

like myself, would gladly afford any beginner such information as he might feel disposed to seek—but how is the tyro to get acquainted with any of these useful members of the community? Of course I cannot answer so clearly for others as I can for myself, but I know this, that if any young collector (not under fourteen years of age) were to write to me for information, I should be more pleased at receiving his inquiry than he would be at obtaining my answer, and let him not imagine that I am a sedate elderly person with no fellow feeling for a mischievous school boy; I have no sedateness about me, and am as full of fun as any one, and as the late Dr. Arnold used, when at Laleham, to "romp and play in the garden, or plunge with a boy's delight into the Thames, entering into his pupils' amusements with scarcely less glee than themselves," so I am quite ready to participate in the delight of the youngest Entomologist, on adding some species to his collection, or some new fact to his knowledge; but further to facilitate the *first step*, and we all know that "ce n'est que le premier pas qui coute," I here give samples of letters, such as may be useful as models by those seeking for information:—

"DEAR SIR,

"Encouraged by your invitation in the Entomologist's Annual, I write to ask if you can tell me at what time of the year I should seek for the larvæ of the Emperor Moth (*Saturnia Carpini*), and which would be the most likely localities in which to find them.

"Believe me, dear Sir,

"Yours very truly,

"DEAR SIR,

"I lately found a hairy caterpillar of a bright yellow, with long red tufts of hair and a black chain-like mark

down the back. I have tried it with various kinds of food, and it will not eat; can you tell me what it is, and on what plant I should feed it? Your invitation to those in search of information encourages me to trouble you with this inquiry.

"Believe me, dear Sir,
"Yours very truly,

The reader will observe, that though addressing a perfect stranger, he commences "*Dear* Sir;" this is the *etiquette* amongst Naturalists; an Entomologist, writing to another for the first time, never thinks of beginning "Sir;" that would be considered very stiff and formal.

The inquiries I have given are two, which I should have been very glad to have put when I was young to any more practised hand, as it was long before I obtained any specimens of *Saturnia Carpini*, and the first larva I found of *Acronycta Aceris* I found on some palings, and though I tried it with various kinds of food, I suppose I never offered it either horse-chestnut or sycamore, and it soon died of hunger.

Insects are transmitted from one Entomologist to another by the post; with larvæ the matter is very simple, as all that is necessary is to place them in a small tin box, with some of the proper food, and wrap up the box in paper and direct it; perfect insects, however, require to be handled with more caution—and in the first place they should be carefully pinned into a small, *light, yet strong* corked wooden box, and those which had large bodies should have them carefully pinned down by two or more pins going crossways over the body; the box should then be carefully wrapped up in several thicknesses of cotton-wool, and then enclosed in paper; the object of the cotton-wool is to prevent any jar to the insects when the box is being stamped in the post-

office, as without the precaution the first stamp it received would probably dislodge several bodies, which would then amuse themselves with knocking off the legs and antennæ during the remainder of the journey. Sometimes, with all our care the box arrives at its destination squashed, and then it affords a capital opportunity of testing the serenity of our correspondent's temper, and his equanimity under trying circumstances, and if he writes a very fierce remonstrant letter the answer naturally suggests itself,

"Absurde facis, qui angas te animi."

INSTRUCTIONS

IN

COLLECTING, REARING, KILLING, PINNING, SETTING AND ARRANGING

LEPIDOPTERA.

(By the Editor.)

How to collect Lepidoptera.

These may be collected in the larva, pupa, or imago state: with the latter or perfect state we will commence the consideration of the subject.

To collect butterflies or moths on the wing, the Entomologist must be provided with a ring net, which should be made of white book-muslin, or of green lino or net; he must also be supplied with a number of pill-boxes, and with a pocket corked collecting-box and some pins. The insect when seen is pursued, but with due caution not to cause it to take alarm, and as soon as contained within the net it must be boxed, or if it be of too large a size, or of a restless nature, it must be pinned. Moths may often be found asleep on palings or trunks of trees, and may be easily boxed without using a net; but some species will readily take alarm when the collector approaches, and he has the disappointment of seeing them fly away just as he was about to box them. Many insects may be dislodged from hedges and bushes by thrashing them with a stick, taking the precaution to keep on the sheltered side of the hedge, as if the young collector

beats a hedge on the side on which the wind is blowing, the moths he dislodges will all effect their retreat on the other, and he will not be benefited, except by the exercise of beating; many insects will be found in grass fields, and may be dislodged by the feet of the collector, or may be obtained by sweeping the herbage. In the Midland counties, and North of England and Scotland, many *Noctuæ* will be found resting on the stone walls, and that rare species, *Crymodes Templi*, is not unfrequently found in heaps of loose stones, by carefully turning them over one by one. Besides the above modes of catching butterflies and moths, some moths may be enticed by stratagem, that is, they may be obtained by SUGAR and by LIGHT.

The moths which are obtained by *sugar* are principally *Noctuæ*. The *Bombyces* never come to sugar, and the *Geometridæ* and *Microlepidoptera* only occasionally, but the *Noctuæ* may be obtained in that way in great numbers; hence our collections are now proportionally much richer in this family than in the others. To obtain moths by sugar, the process is this, a mixture is made of coarse brown sugar and beer, with the addition of a little rum, and this is daubed by means of a painter's brush on the sheltered side of the trunks of trees, or, if there are no trees, on posts, stones, &c. The mixture should be laid on about sunset, or a little before or after, and as soon as it gets dusk the places sugared should be revisited, the collector being provided with a lantern, and for several hours the moths will continue to arrive and may be found sitting at the sugar busily engaged on the dainty meal set before them; at break of day they all however disperse, so that it is of no use to put the sugar on the trees over night and go and look for the moths there the following morning.

The moths which are obtained by *light* are of all the families. *Bombyces, Geometridæ, Pyralides* and *Crambina*,

come very freely, and even the *Sphingidæ* (i. e. the genus *Smerinthus*) sometimes make their appearance. To obtain moths by light it is advisable to have one light outside the room in advance of the window, and one inside the room; the former light bringing the moths within the sphere of attraction of the inner light. Those who try this plan will find that all nights are not equally successful: sometimes the moth will come *in perfect swarms*, and all sorts of rare species come to the collector, instead of his having to go in search of them; at other times, though the weather seems favourable, no moths will come, and the collector becomes disheartened and declares that light is "no go." It is no use to try light on a bright moonlight night, but dark and dull nights, with not much wind, are generally the best, yet I have known moths come freely when a strong wind has been blowing.

There are certain flowers that some moths are particularly fond of, and may be readily caught in the evening dusk buzzing at them; Silene inflata is a general favourite with many species, and the common red valerian, honeysuckle and the lime tree (when in blossom), are also very attractive.

But besides collecting moths in the perfect state, they may also be collected in the chrysalis or pupa state. Old collectors in the time of Haworth used to obtain pupæ by digging for them, but latterly this plan had so rarely succeeded, that it was generally contemned till the Rev. Joseph Greene succeeded in reviving the plan, by the success which attended his energetic assiduity in this mode of collecting. Mr. Greene, who is the only authority to be quoted in respect of digging for pupæ, remarks,* that "meadows and parks with scattered timber trees are generally the best localities; next to meadows and parks come woods, but searching in woods is a tedious and fatiguing affair, and requires some experience: it is in

* Trans. Ent. Soc. vol. 2, N. S., Proceedings, pp. 110, 111.

vain to examine the dense portions, it is equally vain to dig at the roots of trees in such localities, and you will rarely find anything unless upon trees of considerable growth; the thick moss which collects about the trunks and roots is the part to be examined. *Bombyces* are generally found under the moss which covers spreading *roots* and not on the trunks, which seem to be preferred by the *Geometræ*. The best localities in woods are the borders or open places; such places when elevated or facing the north are generally the most productive. Hedge-rows it is perfectly useless to try; *why* it should be so, I cannot tell. The only instrument I use is a common garden trowel; the form is immaterial, perhaps a rounded blade is best, as passing with greater ease between the roots. The trees which I have found the most productive are the following,—elm, oak, ash, poplar, beech, willow and alder. In digging, it must be borne in mind that all pupæ are close to the trunk of the tree, seldom more than two inches distant; frequently the trunk of the tree forms one side of the cocoon, especially the cocoon of such insects as spin; the chrysalis also lies almost invariably close to the surface of the earth. Insert the trowel about three inches from the trunk, to the depth of two inches or so; then push it to the tree and turn up; if the soil be dry and friable, without grass, knock it gently with the trowel, which will be sufficient. If, however, there be grass you must proceed more cautiously; take up the sod on the left hand, knock it very gently with the trowel, and those pupæ which merely enter the ground will drop out; to find those which spin, you must carefully examine the sod, tearing the roots of the grass asunder; these are of course much the most difficult to find, the cocoons being generally of the colour of the earth. It is useless to try sticky or clayey grounds, the caterpillars being unable to penetrate it; in searching under moss the best plan is to loosen the edge, then to tear it gently

off, observing whether any pupæ fall. Look at the trunk of the tree to see if anything adheres to it, and then carefully examine the moss itself; experience alone will enable you to detect a spun cocoon." But the collector must not be discouraged if in digging for pupæ he is not immediately successful, for, says Mr. Greene, "you will perhaps see ten elm trees to your eye exactly alike; at nine you may find nothing; at the tenth possibly twenty or thirty pupæ. I remember on one occasion trying a number of ash trees, without the slightest success, and was about to give up the search as hopeless when I resolved to try one more; at that one I found forty-six pupæ of *Ennomos illunaria*, and three of *Pœcilocampa Populi!*

No pupæ hunter can hope for success unless he have a good stock of patience and perseverance: he must not mind cold hands, wet feet, or an aching back; for although these are drawbacks, yet is the pursuit quite exciting when successful, and it will reward the seeker not merely of *Lepidoptera*, but also of all the other orders of insects.

The best months for digging are October, November, and December, for the spring and summer insects; July and August for the autumnal species."

And, thirdly, we may collect *Lepidoptera* in the caterpillar or larva state. Those who wish to collect larvæ would do well to turn out early in the morning, for many larvæ are epicures, and only eat whilst their food is flavoured with the morning dew; many of the *Noctuæ* larvæ feed only by night and should be sought for with a lantern; those which feed in hedges and trees may frequently be obtained by beating, taking the precaution of holding a net or inverted umbrella under the object beaten; many larvæ may be found by looking for their "frass," the indications where they have eaten, or their ejectamenta; in very windy weather many larvæ get dislodged from the trees by

the continual agitation of the branches, and may afterwards be found endeavouring to regain their position by crawling up the trunk; in the spring many larvæ may be found after dusk feeding on the semi-expanded leaves of sallows and birches.

The larva collector should be provided with one or more tin canisters of convenient size, in which to put the larvæ he may meet with, and should with each, place some of the food-plant on which he has found it; he must, however, early learn to avoid the larvæ of *Cosmia trapezina*, and *Crocallis elinguaria*, as these prefer making a dainty meal of other caterpillars to a more orthodox vegetarian diet.

How to rear Lepidoptera from the pupa or larva state.

To rear pupæ collected is comparatively an easy matter. "The collector should take with him a box (filled with moss) in which to convey the pupæ, and when brought home they should be placed in a large box, with the inside surface *rough*, and covered with gauze or wire frame; at the bottom of the box should be some fine earth, on which the pupæ are to be placed and covered with a thick layer of moss, which may or may not be occasionally damped. *Be sure to keep them from the sun*," so writes Mr. Greene.

To rear larvæ requires considerable care and attention: the larva must be kept well supplied with fresh food; if its food is allowed to become withered or mouldy, the larva cannot be expected to retain its health. The plan used by Mr. Doubleday of Epping, our most successful rearer of insects, is, to get a glass cylinder and sink one end of it into a flower pot in which is some white sand, the sand is kept moist and the food is stuck into it, so as to keep it fresh for some time; the larva is then placed on its food, a bit of gauze is tied over the top of the cylinder, and the flower-pot and cylinder being

kept out of doors, the larva is as nearly as possible in a state of nature, and no doubt larvæ are quite of Mr. Squeers' opinion, that "it is a blessed thing to be in a state of nature."

How to kill Lepidoptera.

The modes of killing in use among collectors are very various; some use prussic acid, some use chloroform; bruised laurel leaves is a convenient way of obtaining the effects of the former poison, without placing anything dangerous in the hands of young people. The receipt for preparing them is as under.

Gather one hundred laurel leaves, the juiciest you can find (yet they must on no account be wet when gathered); take two or three at a time, and hammer them till they are well bruised; then with a pair of scissors cut them into small pieces—as small as you like, and place them in an air-tight vessel, so secured by some contrivance that the pieces shall not roll about loose.

For large moths and sphinges it is necessary to use a more violent poison, and a quill dipped in saturated solution of oxalic acid should be inserted beneath the thorax of the insect, by which means the largest species may be killed almost instantly. Those who want an off-hand way of killing insects when neither acids, laurel leaves or chloroform are at hand, will find that by burning one or two brimstone matches under an inverted tumbler, beneath which the insects to be killed have been placed, and leaving the inverted tumbler full of the sulphureous fumes for a few minutes the insects will be completely killed, but green moths will be liable to lose their colour.

How to pin Lepidoptera.

In the first place the collector must supply himself with solid-headed pins, which he may obtain of W. Gale, Crown Court, Cheapside, London; they are sold in half ounce boxes, and Entomologists in the country can have them forwarded by post.

The proper sizes to order are No. 6 for Sphinges and Bombyces.
,, ,, ,, No. 8 for Noctuæ.
,, ,, ,, No. 8 and No. 10 for Geometræ.
,, ,, ,, Nos. 19 and 20 for Micro-Lepidoptera.

The pin must be inserted in the centre of the thorax, and held as nearly as possible vertical, if anything with the point rather inclining backwards; many collectors hold them with the point inclining forwards, which gives the insect, when set, rather a silly appearance: the pin should be pushed well through the insect, so as to take firm hold of the cork, about one-third of an inch at least, projecting beneath the thorax of the insect.

How to set Lepidoptera.

The variety of apparatus that has been invented for this purpose would be rather puzzling to a beginner. Grooved and rounded corks are used by many for setting the *Noctuæ* and *Geometridæ* upon, and those who have seen such contrivances can imitate them, but to explain them accurately by description would be difficult. For those who have not such contrivances we therefore recommend a sheet of prepared cork, which should be glued on to a flat piece of wood, so as to keep it steady and prevent it from warping; then cut some braces of thick card-board of various lengths, from three-fourths of an inch to two inches, tapering nearly to a point at one end, the other end being about one-fourth of an inch broad; insert on the brace at this broad end a good

strong pin (I obtain of Mr. Gale a No. 12 pin, which answers this purpose), and when about to set out an insect—say a *Vanessa Urticæ* or an *Arctia Caja*—place two of the longest braces about an inch apart, with their points converging, and let the broad end of the brace be kept well up from the board being some height up the pin, the narrow end being in contact or nearly so with the setting board; these are the *under braces*, and the insect is then to be placed midway between them, and its wings expanded *over* these braces and kept in their place by the use of several smaller braces. The insect may thus be made to assume a rounded form, that is to say, the edges of all the wings are deflected so as just to touch the setting board; it gives the insect a graceful pleasing appearance, but surely not a natural one. On the Continent insects are always set on flat setting boards, with a groove to adjust the body, so that by applying flat braces over the wings they are easily kept perfectly flat and horizontal. The same plan is adopted here by many collectors of *Micro-Lepidoptera*, and in many genera is absolutely essential, or the collector must despair of having his specimens named, as the characters frequently lie in the very tip of the cilia. Insects should be left on the setting board from one to four days according to the size of the species and the dryness of the weather.

In summer care must be taken to exclude mites from the setting boards, or they will infallibly destroy all the best species; keeping a good supply of camphor will not always be found sufficient on the setting boards, which are of necessity exposed to the air, but a mixture of equal parts of oil of thyme, oil of anise and spirits of wine, spread over the setting board, and laid on the *grooves* more especially, will be found of greater effect than camphor.

How to arrange Lepidoptera in the Collection.

It is customary to arrange the larger species in single rows, and the smaller ones in double rows, and from four to six specimens of each species forms a good working collection; there are few who can afford cabinet-room for longer series. A list of names printed on one side only (such as Doubleday's List of the larger Lepidoptera and Tortricidæ, and Stainton's List of the Tineidæ), should be obtained, and the names cut out, the generic names being placed above the species and the specific names below them. To name the Lepidoptera there is no better book yet extant than the first edition of Wood's Index Entomologicus, which contains coloured figures of all the British species known at that time: the letter-press sold with the book is useless, but the figures where recognizable are referred to in the British Museum Catalogue of British Lepidoptera, which was commenced by the late Mr. Stephens and concluded by myself.

LEPIDOPTERA.

(By the Editor.)

In this order, which has the greatest number of admirers, several novelties of importance have occurred during the past season, and the list includes several Macro-Lepidoptera, among them one of the *Sphingina*.

The following list of new species, first recorded or observed as British, in 1854, will satisfy those who are forming collections, that they need not be in any excessive fear, lest they should have obtained all the British species, and have "no more worlds to conquer."

Anthrocera Minos.
Petasia nubeculosa.
Spælotis Vallesiaca.
Miana expolita.
Simaëthis Parietariæ.
Eudorea atomalis.
gracilalis.
Crambus Cassentiniellus.
Retinia Resinella.
Gelechia viscariella.
Ypsolophus Juniperellus.
Röslerstammia Pronubella.
Coleophora limosipennella.
Goniodoma auroguttella.
Elachista Poæ.
Gregsoni.
Lithocolletis cavella.
Vacciniella.
Nepticula Weaveri.
Prunetorum.

But before commencing the observations on these novelties, it will not be inexpedient to notice all the new species that have occurred in this country, since the publication of Stephens's Illustrations of British Entomology. This number is

very considerable; and though most have been enumerated in Doubleday's Catalogue of British Lepidoptera, and the Museum Catalogue of Stephens, yet as neither of those works contains any notices of their captures, nor in whose collections they are extant, those who do not mix with the Entomological throng, but derive their information from books, are little aware how completely the entire science has been *bouleversé* in the last twenty years.

I should premise that *Erebia Melampus*, described and figured by Newman, in the Zoologist for 1844, page 729, as a *new British Butterfly*, has long since been consigned to the tomb of oblivion, as being only the Scotch variety of *Cassiope;* and now proceed to the

NEW BRITISH SPECIES SINCE 1835.

Procris Globulariæ, Hübner, which had long been among the *reputed* British species, was first recorded, as actually caught in this country, by Mr. Weir, in the Zoologist for 1845, page 1085. Mr. Weir took the insect in some plenty on the Downs near Lewes, and it has subsequently been taken nearly every year by the collectors of that town and is in all our cabinets. A specimen taken at Cheltenham, by Mr. Douglas, in July, 1853, was exhibited at the ensuing meeting of the Entomological Society.

Phragmatæcia Arundinis, Hübner (*Zeuzera Arundinis*, Doubl.), was first recorded as British by Mr. Doubleday, in the Entomologist, page 156. It is figured and described in Humphrey's and Westwood's British Moths, vol. i. p. 49, pl. viii. fig. 7, 8. In 1848, two other specimens were taken in the same locality, Holme Fen, as recorded by Mr. Doubleday, in the Zoologist for 1848, page 2236. In 1850, Mr. Doubleday writes in the Zoologist, page 2884, "This insect has occurred in great profusion in the neighbourhood of Whittlesea-Mere this season. The larvæ

feed within the stems of the common reed, and the pupa, which is remarkably elongated, is exceedingly active, moving up and down the stems of the reed with great rapidity." Some account of the habits of the insect is given by Mr. Harding, in the Zoologist for 1850, page 2931.

Drepana Sicula, W. V. (*Platypteryx Sicula*, Doubl.). Only a single specimen of this species has been met with in this country; it was taken in Leigh Wood, near Bristol, the end of May, 1837, and is in the collection of the Rev. Henry Burney. According to Treitschke, the larva feeds, in May and June, on oaks and birches.

Cerura bicuspis, Borkhausen; first recorded by Mr. Doubleday, in the Zoologist for 1847, page 1863. "A male specimen of a *Cerura*, new to Britain, was captured near Preston, by Mr. James Cooper; it was found upon an alder, having just emerged from its cocoon; there is little doubt of its being the genuine *bicuspis* of Hübner; the specimens hitherto so-called in this country being merely *furcula*; from this species it is totally distinct. Mr. Cooper most kindly presented this fine species to me." A second specimen is in the collection of Mr. Hodgkinson, who records the capture of the specimen near Preston, on an alder tree (vide Zoologist, 1849, page 2500).

The specimen announced by Mr. Weaver, as *Clostera anachoreta* (see Zoologist, 1852, page 3399), is stated by Mr. Doubleday, in the same periodical (page 3715), to be only *reclusa*.

Notodonta tritophus, W. V.; first recorded as British in the Entomologist, page 385, by Mr. Douglas, who found the larva on an aspen, in Essex, and bred the perfect insect on the 10th of August, 1842. A second specimen, which was taken in Scotland, is in the collection of Mr. Buxton; it was exhibited at the meeting of the Entomological Society in December, 1852. An ichneumoned larva of this species

was observed by the Rev. Jos. Greene, in Gloucestershire, on hazel, as recorded in the Zoologist for 1852, page 3494.

GLUPHISIA CRENATA, Esper; first recorded as British by Mr. Doubleday, in the Entomologist, page 156—"*Chaonia crenata:* the first British specimen of this insect was taken at Ongar Park Wood, in June, 1839, and a second in the same place, in June of the present year. Both specimens were females." The species is described and figured in Humphrey's and Westwood's British Moths, vol. i. p. 73, pl. xiv. fig. 15. A specimen reared by the Rev. Jos. Greene. from a larva found on a poplar, near Halton, Bucks, on the 18th of August, 1853, was exhibited at the meeting of the Entomological Society, in April last.

GASTROPACHA ILICIFOLIA, LIN. This insect had long been a *reputed* British species, and is described and figured in Humphrey's and Westwood's British Moths, vol. i. p. 61, pl. xii. fig. 8; but no British specimen had been seen by any of the Entomologists of the present day, till in 1851, Mr. Atkinson met with a specimen at Cannoch Chase, May 17th, as recorded by him in the Zoologist for 1852, page 3396: "It was clinging to a dead sprig of heather, apparently but lately emerged from the pupa. From its great resemblance to a withered leaf, it would not probably have caught my eye, had I not luckily knelt down within a few inches of it, to pin a small *Tortrix*. This fine addition to our *Bombyces* was announced at the June meeting of the Entomological Society, and exhibited at the subsequent one in July." The insect has also been bred by [Mr. W. Green, of Eccleshall Road, Sheffield,] but it is still in very few collections. According to Treitschke, the larva feeds from June to August, on sallow and bilberry.

STERRHOPTERYX OPACELLA, H.-S.; discovered in the New Forest, by Mr. Weaver, who found the larvæ in the summer of 1848, as recorded by Mr. Newman in the Zoo-

logist for 1850, Appendix c. Newman describes it as *Pysche Fenella*, but the specimens then known were not as fine as some Mr. Weaver subsequently bred, when Mr. Stephens was enabled to recognize it as the *opacella* of Herrich-Schäffer. It is still in few collections.

PSYCHE MARGINENIGRELLA, Bruand; in the collection of Mr. Bond. The following notice of it appears in the Proceedings of the Entomological Society for May, 1853. "Mr. Bond exhibited a specimen of a *Psyche* new to this country, pronounced by Mr. Bruand, who was engaged on a Monograph of the *Psychidæ* to be his *P. marginenigrella*. Mr. Bond reared it from a case which he found attached to a tree, either in Lancashire or Yorkshire." M. Bruand returned the specimen as probably new, and suggested the name in case it should prove so; but he wished to see more specimens, and know more of its history, before describing it, hence it is not mentioned in his Monograph of the *Psychidæ*.

FUMEA RETICELLA, Newman; first recorded by Mr. Newman in the Zoologist for 1847, p. 1863—"Mr. Ingall has captured a small *Psyche*, with beautifully mottled wings; it is very different from the known British species, but in some degree resembles *Psyche undulella* of the Continent; it is proposed to call the new species *Psyche retiella*." Mr. Stevens met with it near Sheerness in June, 1850, among *Plantago maritima* (see Zoologist, 1850, page 2857). Newman describes it in the Zoologist for 1850, Appendix xciv., under the name of *Psyche reticella*. It is not at present in many collections.

LITHOSIA PYGMÆOLA, Doubleday; first recorded in the Zoologist for 1847, page 1914, where Doubleday describes it, and then adds—"This small species, which appears to be new, has been taken on the coast of Kent among rushes." A more detailed notice of the capture of this species, from the pen of Mr. Harding, appears in the Zoologist for 1849,

page 2547—"they are very local, being only found over a space of about 400 yards in extent, on the coast of Deal."

TRYPHÆNA SUBSEQUA, W. V. Concerning the *true subsequa*, Mr. Doubleday writes in the Zoologist for 1844, page 399—"Mr. Bentley possesses two specimens of the species, one captured by himself in Hampshire, the other from Mr. Stone's Cabinet, probably taken in the same county. The species is very likely to occur in the southern counties, as it is not uncommon in the northern parts of France." Since this was written, it has been repeatedly taken by sugaring in the New Forest, and is now in most collections. The black spot towards the apex of the costa of the anterior wings, as in *pronuba*, at once distinguishes it from *orbona*.

OPIGENA FENNICA, Eversmann. "A single specimen of this *Noctua*, hitherto unknown in Britain, and principally found in Finland, has been taken in Derbyshire;" this notice by Mr. Doubleday appears in the Zoologist for 1850, page 2971. The specimen is in the collection of Mr. Allis. Guenée retains this species in his genus *Agrotis*, but observes that it has "un facies particulier." It is figured by Duponchel and Herrich-Schäffer.

GRAPHIPHORA DITRAPEZIUM, Bork., (*Noctua ditrapezium*, Doubl.); first recorded as British under the name of *tristigma* by Mr. Stevens, Zoologist for 1846, page 1347—"I fortunately possess a specimen of this distinct species, the true *Graphiphora tristigma* of the Continent, which I have had in my cabinet the last two years, and supposed it only an extraordinary variety of *triangulum*, which it much resembles;" and he then proceeds to describe wherein it differs from *triangulum*. At the August meeting of the Entomological Society in 1852, "Mr. S. Stevens exhibited *Graphiphora ditrapezium*, reared from a larva found at Leith Hill, in Surrey." An old specimen has been detected in the collection of the Entomological Society. The larva,

according to Treitschke, feeds on various low plants, especially the dandelion, and is full grown in April.

GRAPHIPHORA SOBRINA, Boisduval; thus recorded in the Proceedings of the Entomological Society for November, 1853—"Mr. Edwin Shepherd exhibited a new British moth, *Noctua sobrina*, H.-Schäffer, taken this season in Perthshire by Mr. Weaver." Several specimens have been taken in Scotland during the past season. It is not a common species on the Continent; Guenée describes the larva, but adds—"I know not on what plant it lives."

[CERASTIA LEUCOGRAPHA, Hübner (*Noctua leucographa*, Doubleday). The capture of this species is recorded by Mr. Robert Cook in the Zoologist for 1845, page 945. Mr. Cook captured his specimen near York; it has also been taken rather freely at Doncaster, and has occurred near Cockermouth; it has occurred likewise in the south of England, having been taken at Leith Hill, near Dorking, and at Great Marlow, Bucks. It appears about the middle of March, frequenting the sallows when in blossom.]

ORTHOSIA OPIMA, Hübner (*Tæniocampa opima*, Doubl.); first recorded as British by Mr. Newman in the Zoologist for 1845, page 844; and at the page 1006 of the same volume Mr. Allis observes—"this insect was first taken at York in 1842, in which year I captured two specimens upon sallow blossoms, and another was taken by Mr. Cook; we also with met it the two following years, but not in any plenty." It has since been taken very freely at Doncaster; and Mr. Evans, of that place, gave a description of the larva in the Zoologist for 1846, page 1227. The insect is now common in all collections.

ORTHOSIA CONGENER, Hübner; thus noticed by Mr. Doubleday in the Zoologist for 1843, page 332—"The insect taken at York by my friend Thomas H. Allis, and supposed to be *Apamea unanimis*, is *Orthosia congener* of

Boisduval, of which *Caradrina iners* of Treitschke is a variety." It has subsequently been repeatedly taken in the north of England and in Scotland in July and August, and is now in most collections.

ORTHOSIA HYPERBOREA, Dalman. The capture of the first British specimen is recorded by Mr. Douglas in the Entomologist, page 105, as *Agrotis* ——. Mr. Douglas took it on Cairn Gowr, in Perthshire, at an elevation of 3,000 feet. It remained unique in this country till the past season, when a second specimen was taken in Scotland by Mr. Foxcroft, and is now in the collection of Mr. Bond. The specimen taken by Mr. Douglas is described and figured in Humphrey's and Westwood's British Moths, vol. 1, p. 118, pl. xxiii. fig. 13, as *Agrotis alpina*.

ORTHOSIA RUTICILLA, Esper. Of the insect which Mr. Stephens supposed to be the *ruticilla* of Esper, two specimens only have been met with in this country; they were exhibited by Mr. Stephens at the February meeting of the Entomological Society in 1850—"Of these specimens one had been sent to Mr. Shepherd by Mr. Edleston; and the other, which was extremely wasted, was taken by Mr. Stainton at Sheffield in June, 1847." It seems now generally admitted, that these cannot be truly the continental *ruticilla*, but their real name has not yet been ascertained.

GLÆA ERYTHROCEPHALA, W. V.; in the collection of Mr. H. Cooke of Hastings, who thus records the capture, Zoologist for 1849, page 2404—"In November, 1847, whilst sugaring in the parish of Hurst (about seven miles from Brighton) I had the good fortune to meet with a fine specimen of this insect in company with *Glæa Vaccinii* and *G. spadicea*. It at once attracted my attention as being something fresh, but I could not discover what it was, nor could any of my neighbours assist me. A short time since I showed it to Mr. Douglas, and also to Mr. S. Stevens; and ultimately

it was discovered to be the true *Glæa erythrocephala*, Hübner, var. *glabra*, Duponchel. It was exhibited at the meeting of the Entomological Society, in February, 1849; and, being an addition to our *Noctuæ*, of course created interest. I have constantly visited the same locality, in the proper season, but have not succeeded in capturing another. This is, I believe, the only authenticated specimen of the species in Britain, and as such is a prize." This insect is not uncommon on the Continent; indeed, Guenée says of it, "nearly as common in some localities as *Vaccinii*." It has quite the appearance of a *Glæa*, but is nearly double the size of *Vaccinii*, so that it may be immediately recognized by the veriest tyro.

Aporophyla australis, Boisd.; mentioned in Curtis's Notice of the Genus Agrotis, British Entomology, folio 165, "*Pascuea*, Nob. Isle of Wight;" described and figured in Humphrey's and Westwood's British Moths, vol. i. p. 123, pl. xxiv. fig. 2. In the Zoologist for 1848, page 2331, Mr. Stevens records the capture of four specimens near Deal "on blades of grass on the sand hills, in the dusk of evening, evidently from their fine condition only just emerged from the chrysalis;" it has subsequently been taken in some plenty in various parts of the southern coast, and is now in most collections.

Lithomia Solidaginis, Hübner; first recorded as British by Curtis, in his British Entomology, folio 683, where it is also figured and described. It occurs in great profusion in the north of England and has also been met with in Scotland. It is to be found now in the duplicate boxes of every collector.

Hama Dumerilii, Duponchel; only a single British specimen is known; it is in the collection of the late Mr. George Robertson, of Limehouse. The species is not uncommon in the neighbourhood of Paris, where it occurs on

the trunks of elms in September. It has considerable resemblance to *Hama testacea*.

HAMA FURVA, W. V.; this insect had been taken by Mr. Logan prior to 1846, and it has since occurred near Arthur's Seat every summer, and has also been taken by sugaring in other parts of Scotland. [Mr. Gregson and Mr. Almond met with it at Llanferras, in Wales, last year; and the Rev. Joseph Greene took a fine specimen on the 10th of June last, in the neighbourhood of Kingstown, near Dublin.] The *true furva* was first introduced in our lists by Mr. Doubleday, in his Catalogue of Lepidoptera, page 7.

HADENA SATURA, W. V.; a specimen is in the collection of the Rev. Mr. Bird, who attracted it by light in Oxfordshire; Mr. Doubleday has a specimen from Cambridgeshire. It is nearly half as large again as *adusta*, dark varieties of which are continually being taken for *satura*.

HADENA ASSIMILIS, Doubleday; described and first recorded by Mr. Doubleday in the Zoologist for 1847, page 1914; it was first taken in Scotland by Mr. Weaver in 1846." I have a specimen taken sitting on a rock in the Isle of Arran in 1847. Few specimens have since occurred and it is still in very few collections.

HELIOPHOBUS HISPIDUS, Hübner; first recorded as British by Mr. Bull in the Zoologist for 1849, page 2369—"I took one specimen of this rare *Noctua* late in September, on the sand hills at Exmouth." It had previously been taken in the Isle of Portland by Mr. T. Lighton; and in 1851 Mr. S. Stevens, "having long had a desire to search for it himself, there visited the island expressly for the purpose, and in three days and nights, with the assistance of two men, succeeded in finding fifteen fine specimens sitting on the rocks" —as recorded by him in the Zoologist for 1851, p. 3289. Mr. Stevens has distributed his specimens in most of the principal collections.

Epunda Lichenea, Hübner; first taken in this country by Mrs. Vines, in the New Forest, in the autumn of 1847, and first enumerated as British in Doubleday's Catalogue, page 10; subsequently it occurred on the Lancashire coast, "nearly 100 specimens of this insect having been taken at New Brighton" in September, 1850, as recorded by Mr. Robson in the Zoologist for 1850, page 2958. It has also occurred in plenty in the Isle of Wight.

Acronycta Myricæ, Guenée; this species, which is in our lists as *Acronycta Euphorbiæ*, is first recorded as being taken in this country by Mr. Weaver in the Zoologist for 1846, page 1439—"from May 27th to June 15th, at rest on rocks in open moors;" it has since been taken by nearly every collector who has penetrated into Perthshire during the season, and is in most of our collections. It is described by Guenée in his "Histoire Naturelle des Noctuélites," being placed immediately after *Acronycta Euphorbiæ*, *Euphrasiæ* and *abscondita*. Guenée says—"This pretty *Acronycta* appears to me very distinct from the allied species." The larva feeds on *Myrica gale* and *Salix capræa*.

Xanthia gilvago, W. V.; first described and recorded as British in Humphrey's and Westwood's British Moths, vol. i. p. 254, with the remark—"The *true gilvago* is now for the first time introduced into the British lists, on the authority of J. F. Stephens, Esq., who has received it from the neighbourhood of Doncaster, where it was captured last September in some plenty by the Rev. Mr. Preston," [or, more correctly, by his friend, Mr. Hugh Reid.] It has since been repeatedly taken in the same locality, and also in some other parts of Yorkshire, and is now distributed in most collections. Guenée says—"It is very common in France, the larva feeding on the seeds of the elm." A species (*Xanthia ocellaris*) very closely allied to it, and only recently dis-

tinguished from it, frequents poplars. Guenée says—"The larva lives in the buds of the poplars, and is almost as abundant as that of *gilvago* is on the elms."

GORTYNA PETASITIS, Doubleday; first recorded as captured in this country by myself (Zoologist for 1846, page 1229). A notice of its habits by Mr. Edleston appears in the Zoologist for the same year at page 1347. It frequents the butter-bur, *Tussilago Petasites*, the larva feeding in the root of that plant, as observed by Mr. N. Cooke in the Zoologist for 1850, page 2932. The species was first described by Doubleday in the Zoologist for 1847, page 1914, and since has been described and figured by Freyer and Herrich-Schäffer under the name of *Vindelicia*. Since the northern collectors have learned to breed the species it has become generally distributed in collections.

CARADRINA EXIGUA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 27. A specimen taken by Mr. Maitland at Ventnor is in his collection.

HYDRILLA PALUSTRIS, Hübner; a specimen taken near York is in the collection of Mr. Allis. Apparently a scarce continental species, occurring, according to Guenée, "in South Russia, Austria, the Valais, in May and July."

NONAGRIA EXTREMA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 27, the species named *extrema* at page 7 having been ascertained to be really *fulva*. It has occurred in some numbers at Whittlesea-Mere in 1848 and 1849, and is in most collections. It is at once distinguished from *N. fulva* and *N. Hellmanni* by the *straight* hinder margin of the *bone-white* anterior wings. Guenée describes it under the name of *N. concolor*, conceiving it to be distinct from the *extrema* of Hübner, though probably identical with the *extrema* of Herrich-Schäffer.

NONAGRIA HELLMANNI, Eversman; the capture of this species in this country is first recorded by Mr. Bond in the

Zoologist for 1847, page 1881. Mr. Bond met with it at Yaxley in August, "sparingly at sugar;" it has since been taken in some plenty at Yaxley and Whittlesea, and is in most collections.

NONAGRIA NEURICA, Hübner; likewise first recorded as being taken in this country by Mr. Bond at page 1881 of the Zoologist for 1847; subsequently taken in some plenty at Whittlesea-Mere, and now in most collections.

NONAGRIA CANNÆ, Och.; first enumerated as British in Doubleday's Catalogue at page 7. It was first taken in 1846 by Mr. English; since then it has been freely bred by the collectors at Yaxley.

CUCULLIA LYCHNITIS, Rambur; first recorded as British by Mr. Stevens in the Zoologist for 1845 at page 1142—"I have annually, for the last three or four seasons, obtained the caterpillars of this rare shark from off the leaves and flowers of the mullein found in a chalk-pit at Arundel, in Sussex." The larva feeds in August and September, whereas that of *C. Verbasci* feeds in June and July. As the insect is still scarce in collections it may be well to bear this circumstance in mind.

CLOANTHA PERSPICILLARIS, Lin.; a single specimen taken by the late Mr. Paget near Yarmouth, the capture of which is recorded in the Entomologist, June, 1841, page 128, is in the collection of Mr. Doubleday. The species is figured and described in Humphrey's and Westwood's British Moths, vol. i. p. 230, pl. li. fig. 1. According to Guenée the species is widely dispersed on the Continent, but "never very abundant." "The larva feeds in July and August on *Hypericum*."

HELIOTHIS ARMIGERA, Hübner; first recorded as British by Mr. Edleston in the Zoologist for 1843, page 260—"a beautiful female specimen having been taken in September, 1840, off the door of an outhouse belonging to my friend

Mr. John Thomas, of Oldfield Lane, Salford, who liberally added it to my cabinet." A specimen taken near Mickleham is in the collection of Mr. Bedell, and other specimens have been taken in various localities.

HELIOTHIS SCUTOSA, W. V.; first recorded as British by Curtis, who figures and describes it in his British Entomology, folio 595; the specimen from the collection of Mr. Heysham, "was taken on the banks of the river Caldew, a little below the village of Dalston, in July, 1835."

I am not aware of any specimens having occurred subsequently. According to Freyer, the larva feeds on *Artemisia campestris.*

OPHIODES LUNARIS, W. V.; first enumerated as British in Doubleday's Catalogue, page 11; a single specimen was taken by Captain Chawner in Hampshire. Of this species Guenée says, "common in dry woods throughout Europe in May." "The larva feeds in July on oak."

DASYDIA TORVARIA, Hübner; thus noticed at page 678, vol. ii., of Humphrey's and Westwood's British Moths—"Many years ago my friend Templeton showed me a black Geometrideous moth, much larger than *M. Chærophyllata*, which he had captured on one of the mountains in Ireland. I have seen nothing like the insect in any collection that I have examined." In Stephens's Museum Catalogue this specimen is enumerated as *Dasydia torraria.* At the meeting of the Entomological Society in November, 1853, "Mr. Westwood exhibited his original sketch of a moth taken at Ballymena, in Ireland, by Mr. Templeton; Mr. Westwood was now of opinion, from reference to Duponchel's figure and description, that it was *Cleogene Peletieraria;*" whether Mr. Stephens or Mr. Westwood is correct in the name given for this species, future observation must decide.

EUPISTERIA CARBONARIA, Lin.; first noticed as British by Mr. Doubleday in the Zoologist for 1847, page 1883,

under the name of *Eupisteria picearia* — "This species, which is new to Britain, was taken by Mr. Hodgkinson in Perthshire." It has since been several times taken in Scotland. At the Meeting of the Entomological Society in June, 1851—"Mr. Stevens exhibited fine specimens of *Eupisteria Carbonaria*, recently taken in Perthshire by Mr. Weaver."

GEOMETRA ALNIARIA, Lin.; a single specimen, taken at the North Foreland lighthouse, is in the collection of Mr. Edwin Shepherd; it is first enumerated as British in Doubleday's Catalogue, at page 15.

TEPHRONIA CORTICARIA, W. V.; first enumerated as British in Doubleday's Catalogue, at page 17; a specimen is in the collection of the British Museum, ticketed by Dr. Leach as having been taken by him at Tenby.

ELECTRA SAGITTATA, Fab.; first noticed as British by Mr. Doubleday in the Zoologist for 1848, page 2236—"A single example of this pretty species was obtained last season near Peterborough, but I believe it was not in very good condition. A splendid female was sent to me from the same neighbourhood this week (July 15th, 1848)." A specimen was exhibited by Mr. Bond at the meeting of the Entomological Society in August, 1849. In the years 1853 and 1854, many specimens occurred in the fens of Huntingdonshire and Cambridgeshire, and the insect is now in most collections.

VENUSIA CAMBRICA, Curtis; first described and figured by Curtis in his British Entomology, folio 759, in 1839. The insect continued rare for many years, but has now been taken rather freely in several parts of the north of England, and is in most collections. It is described and figured in Humphrey's and Westwood's British Moths, vol. ii. p. 35, pl. lxiii. fig. 15. In Doubleday's Catalogue it stands as *Coremia erutaria*.

YPSIPETES RUBERATA, Freyer, long confounded with

Y. impluviata, and therefore overlooked; it is mainly distinguished by its larger size, and the anterior wings being more elongated. It is not uncommon in the fens of Cambridgeshire and Huntingdonshire.

CHEIMATOBIA BOREATA, Hübner; the capture of this insect in Britain is first recorded by Mr. Cooke in the Zoologist for 1850, page 2749—"Four males of this moth were captured at Petty Pool, Delamere, Cheshire, on the 31st of October, 1848. They were resting on the trees." In the autumn of 1850 it was taken in great abundance in the same locality (Zoologist, 2971), and was liberally dispersed by the captors among all our collections. It is at once distinguished from *C. brumata* by being larger and paler.

OPORABIA AUTUMNARIA, Boisduval; enumerated as British in Doubleday's Catalogue, at page 18. Its capture is recorded by Mr. Weaver in the Zoologist for 1852, page 3495—"It rests on the branches of birch. I captured a few specimens in Perthshire in 1851, and found it very sparingly in previous seasons." Mr. Weaver says—"This species is readily distinguished from *O. neglectata* and *dilutata* by the glossy silver and fineness of the wings, and the slenderness of the antennæ." For my own part I have never been able to satisfy myself that it was specifically distinct from *O. dilutata*. *Oporabia neglectata*, which is also noticed by Mr. Weaver in the Zoologist at page 3496, and is enumerated as a distinct species in Stephens's Museum Catalogue, but I am not aware that its claim to be considered a species has yet been satisfactorily established.

OPORABIA FILIGRAMMARIA, Boisduval; the capture of this species in this country was first recorded by Mr. Edleston in the Entomologist, at page 356, under the name of *O. polata*, under which name it is figured and described in Humphrey's and Westwood's British Moths, vol. ii. page

56, pl. lxix. fig. 9. Many specimens have been taken in the north of England and Scotland, and the species is in most collections. The *Oporabiæ approximaria* and *precursaria*, mentioned by Mr. Weaver at page 3496 of the Zoologist, are probably varieties of this species.

EUPITHECIA TOGATA, Hübner; first discovered in this country in 1845, being then met with "in a plantation of spruce firs at Black Park, Bucks, in the middle of June," as recorded by Mr. Stevens at page 1086 of the Zoologist for 1845. A figure and description of the insect by Newman is on the same page. The insect has continuously been met with at Black Park in subsequent seasons, and is now in most collections.

EUPITHECIA PUSILLATA, Hübner; the *true pusillata* (that of Haworth being the *Begrandaria* of Boisduval) was first enumerated as British in Doubleday's Catalogue at page 19. Mr. Doubleday writes—"I have three specimens taken by Mr. Wood, gardener to Captain Chawner, Ashburton, Devonshire; the large central black spot in the anterior wings is a good distinguishing character."

EUPITHECIA PALUSTRARIA, Doubleday; first recorded and described by Doubleday in the Zoologist for 1850, App. cv. "This insect appears to be common in the fens of Huntingdonshire; it flies by day, sporting in the sunshine in company with *Pyrausta cespitalis*, from which it is not easily distinguished on the wing." This species is readily recognised by the almost unicolorous anterior wings, and conspicuous white spot at the anal angle.

EUPITHECIA CALLUNARIA, Sta.; first recorded and described by Doubleday in the Zoologist for 1850, App. cv. The species is very common on heaths in the north of England and Scotland, but it is an unsatisfactory obscure looking insect, and it excites little surprise that it remained so long undescribed.

EUPITHECIA INNOTATA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 19; the species has been bred by the Rev. Mr. Turner, and was taken by the late Mr. Paget at Yarmouth.

EUPITHECIA LANCEOLARIA, Rambur?; first enumerated as British in Doubleday'a Catalogue, at page 19. Mr. Doubleday has a specimen which *may be* identical with Rambur's species; it was taken at Sudbury in Suffolk.

EUPITHECIA TENUIATA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 19; its capture is recorded by Mr. Sircom in the Zoologist for 1851, at page 3287: it is a pretty and distinct looking species; the larva feeds in the catkins of the sallow in May.

EUPITHECIA ULTIMARIA, Stevens; thus noticed in the Proceedings of the Entomological Society for October, 1851—"Mr. S. Stevens exhibited *Eupithecia ultimaria*, Ramb., Boisd., Dup., a new British species, taken at Dover in the middle of September." The insect in question appears to have no affinity to the continental *ultimaria*, and Mr. Doubleday thinks it may be the *expressaria* of Herrich-Schäffer. The question of its proper name must remain for further consideration.

EUPITHECIA INDIGATA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 19; the capture of it at Birch Wood is recorded by Mr. Douglas in the Zoologist for 1851, at page 3247. I have received it from Scotland, and it is now in most collections; formerly, no doubt, it was mixed with *E. minutata*.

EUPITHECIA SATYRATA, Hübner; first recorded as British, as *E. fagicolaria* by the Rev. Joseph Greene in the Zoologist for last February, page 4187; but the insect had been in our collections several years, having been taken near Mickleham by Messrs. Douglas and Weir in June, 1849; the Rev. Mr. Greene found the insect at Halton, Bucks,

"extremely local, being confined to one open spot in Beech Wood, but very common there." In the Zoologist for July last, page 4370, Mr. Harpur Crewe records having bred this species from larvæ found on *Gentiana campestris* in August and September, in company with the larvæ of *E. piperata*. This species is figured by Hübner, H.-S., and Freyer; it is rather a large species, and might be well placed between *E. Callunaria* and *E. subnotata*.

Eupithecia Pimpinellata, Hübner, (distinct from *Austerata*), was bred in 1851 by the Rev. J. S. Henslow, from larvæ found in August, 1850, feeding on the flowers of *Pimpinella Saxifraga*, at Hitcham, Suffolk. (A notice of this appeared in the Zoologist for 1852, page 3358, but the name of the insect was not then ascertained.)

Acidalia obsoletaria, Rambur; first enumerated as British in Doubleday's Catalogue, at page 19; this species has been taken near Manchester. Mr. Doubleday has a pair he received from Mr. Edleston.

Acidalia perocharia, Tischer; first enumerated as British in Doubleday's Catalogue, at page 19. It has occurred in considerable plenty on the Essex coast, at Southend and St. Osyth, and is now in most collections.

Acidalia holosericearia, Parreyss; first enumerated as British in Doubleday's Catalogue, at page 19. It occurs commonly in the neighbourhood of Bristol; its capture there is recorded by Mr. Sircom in the Zoologist for 1851, at page 3288; it is now in most collections.

Schrankia turfosalis, Wocke (*Hypenodes humidalis*, Doubleday); first recorded as British, and described by Doubleday, in the Zoologist for 1850, App. cv.—"It was captured in the bogs of Ireland, in 1848, by Mr. Weaver, and has been discovered in abundance this season by Messrs. N. Cooke and Greening, of Warrington." In the Zoologist for 1851, Mr. Harrison, of Keswick, writes, at page 3244,

concerning this species, "From the middle of July, up to the 8th of August, it might be seen any fine evening, between the hours of six and eight, flying on most of our swamps in great plenty. To give you an idea of its numbers, I may state that I took forty specimens in less than one hour, and might have taken as many dozens, could I have boxed them fast enough."

BOTYS TERREALIS, Treitschke; first enumerated as British in Doubleday's Catalogue, at page 14. The insect is nearly allied to *B. fuscalis*, but the anterior wings are narrower and more pointed, and the posterior wings are darker. [A few specimens have occurred at Llanferras, in Wales; it has also been taken] in Scotland, but is rare, and still in few collections. According to Fischer, the larva feeds on the golden rod in September.

RHODARIA SANGUINALIS, Lin.; first recorded as British by Mr. Doubleday, in the Zoologist for 1849, at page 2547.—"This lovely little *Pyralis* was taken on the 25th of June, at New Brighton. I had previously received two specimens, in rather a faded condition, from the fens." At page 2932 of the Zoologist for 1850, further captures of this species are recorded, and it has since been taken in great plenty on the sandhills of the Cheshire coast, and is now in all collections.

ASOPIA NEMORALIS, Scopoli; a single specimen is in the collection of Mr. Hemmings; it was taken June 26th, 1851, at Holm Bush, near Henfield, Sussex; it was exhibited at the meeting of the Entomological Society, in October, 1853. I believe a few others were taken at the same time. It is a very distinct species, and is not uncommon on the Continent.

SIMAETHIS VIBRANA, Hübner; a specimen of this, taken September 11th, 1853, near Hurst, Sussex, is in the collection of Mr. Hemmings: it was exhibited at the meeting of

the Entomological Society in October, 1853. This specimen was taken amongst *Inula dysenterica*, and in all probability the larva feeds upon that plant. Should this prove to be the case, it will show that this is the *Tinea Bjerkandrella* of Thunberg, which was bred from larvæ on *Inula salicina*. It is very distinct from our other British species of *Simaëthis*. Mr. S. Stevens has also a specimen taken near Arundel.

EUDOREA ALPINA, Dale; first recorded and described by Curtis, in the Annals and Magazine of Natural History, 2nd series, vol. v. page 116; the species has occurred on several of the Scotch mountains, but fine specimens seem very scarce.

CHILO CICATRICELLUS, Hübner; a specimen in Mr. Shepherd's collection was exhibited at the meeting of the Entomological Society in September, 1852; it was "taken flying, near Dover." The larva feeds in the stems of the bull-rush (*Scirpus lacustris*), in June, and changes to pupa within the stem, the perfect insect appearing in July.

LOZOTÆNIA DUMETANA, Treit.; first enumerated as British in Doubleday's Catalogue, page 21. It has only been taken by Mr. Weir in the neighbourhood of Lewes; it is readily distinguished from other British species of the genus by the *whitish underwings*.

LEPTOGRAMMA SCOTANA, Guenée; first enumerated as British in Doubleday's Catalogue, at page 21; it is described in the Appendix to Stephens's Museum Catalogue. It has been taken in Perthshire by Mr. Weaver.

PERONEA MACCANA, Treit.; described and figured as *Peronea marmorana* in Humphrey's and Westwood's British Moths, vol. ii. p. 159, pl. xciv. fig. 9, from a specimen taken by Mr. Bentley in Epping Forest in October, 1824; several specimens have since been bred by Mr. Weaver, from larvæ found in Scotland on the *Vaccinium myrtillus*.

PERONEA LIPSIANA, W. V.; first enumerated as British in Doubleday's Catalogue, at page 21, as a doubtful variety of *P. rufana;* in the past season, Mr. Bouchard bred a series of this insect, and had not a single *rufana* among them.

PERONEA CALEDONIANA, Bentley; first enumerated as British in Doubleday's Catalogue, at page 22; it is described in the Appendix to Stephens's Museum Catalogue. I have frequently taken it on boggy moors in the south of Scotland; its small size readily distinguishes it from the allied species.

PERONEA PERMUTANA, Dup.; first recorded as British by Mr. Cooke in the Zoologist for 1848, page 2271—"On the 13th of August, I took three specimens of this insect on the wing, at dawn of day, at New Brighton, flying over a species of wild rose which grows there in profusion." It has since been taken and bred in profusion in the same locality, and has also been met with plentifully on Barnes Common. It is extremely like the *borana* variety of *variegana.*

PARAMESIA SHEPHERDANA, Stephens; first enumerated and described by Stephens in the Museum Catalogue; the locality there given is, however, erroneous, as mentioned by Mr. Doubleday in the Zoologist for 1852, page 3583. "Mr. Shepherd met with larvæ in the fens of Cambridgeshire; it feeds upon the meadow-sweet, (*Spiræa Ulmaria*)." Mr. Doubleday now writes me, that it feeds upon *Eupatorium Cannabinum,* and not upon *Spiræa.*

DICTYOPTERYX ULIGINOSANA, Bentley; first recorded, described and figured in Humphrey's and Westwood's British Moths, vol. ii. p. 139, pl. lxxxvi. fig. 12. "Two specimens were taken at Whittlesea-Mere in July, 1824, by Mr. Bentley, in whose cabinet they are preserved." I know of no recent specimens.

ANTITHESIA CAPRÆANA, Hübner; first recorded as British

in the Proceedings of the Entomological Society, for July, 1849—"Mr. Weir exhibited specimens of *Antithesia Capræana*, reared froms allow leaves." Mr. Doubleday writes me—"I have bred it from sallows, but it seems rare here, and I am not aware that it is common anywhere—it is a very distinct species."

ANTITHESIA OCHROLEUCANA, Hübner; first recorded as British by myself, in the Zoologist for 1848, page 1987—It is a common species in gardens, the larva feeding on the rose.

ANTITHESIA PRÆLONGANA, Guenée; first recorded as British by myself, in the Zoologist for 1848, at page 1988—I have several times met with it Scotland.

ANTITHESIA DIMIDIANA, Treit.; the capture in this country is first recorded by Mr. Weaver, in the Zoologist for 1845, at page 847, as *Antithesia Weaverana*. In the Zoologist for 1848, page 1988, I described it under the name of *A. leucomelana*. It is not at all an uncommon species in Scotland and in the north of England.

ANTITHESIA SAUCIANA, Hübner; the first notice we find of this as a British insect is in the Proceedings of the Entomological Society, for April, 1849, when "Mr. Douglas stated that the *Tortrix*, taken last season at Leith Hill, Surrey, by Mr. Benjamin Standish, was the true *Penthina sauciana* of Hübner." The insect has since occurred in plenty in the north of England, among bilberry, and is now in most collections.

ANTITHESIA GREVILLANA, Curtis; figured and described by Curtis, in his British Entomology, fol. 567, from specimens captured by Dr. Greville, and Mr. James Wilson in Sutherlandshire, in July. Two or three specimens have since been taken by Mr. Weaver.

SPILONOTA ROSÆCOLANA, Doubleday; thus noticed by Mr. Douglas, in the Zoologist for 1849, page 2364—"From

rose leaves I reared *Spilonota aquana, S.*——, N. S." This latter, the *new species,* is enumerated in Doubleday's Catalogue, at page 23, as *rosæcolana;* and also described in the Zoologist for 1850, Appendix cvi. It is not uncommon in gardens in some localities. The rounded costa of the anterior wings readily distinguishes it.

SPILONOTA AMŒNANA, Dup.; first noticed as British by myself, in the Zoologist for 1848, page 1988—The insect had then occurred in many localities, and has since been met with plentifully: it frequents the *Rosa spinosissima.*

SPILONOTA NEGLECTANA, Dup.; first enumerated as British in Doubleday's Catalogue, page 23—the species had previously been confounded with *dealbana,* under the name of *sociana.* From *dealbana* it is distinguished by the basal portion of the anterior wings being of a darker colour, with a blueish tint. From Mr. Doubleday's and Mr. Douglas's observations this frequents poplars.

SPILONOTA ACERIANA, Dup.; first recorded as British by myself, in the Zoologist for 1847, page 1989, as *Philalcea Aceriana;* it had previously been confounded with *dealbana,* It is a very common species among poplars in July.

GRAPHOLITHA MINUTANA, Hübner; described and first recorded as British by Douglas, in the Zoologist for 1845, at page 844, under the name of *Carpocapsa minutana.* It is by no means uncommon on palings under white poplars, at Camberwell and Blackheath, in July, and is now in most collections.

GRAPHOLITHA GEMINANA, Stephens; first enumerated and described by Stephens, in his Museum Catalogue, page 35 and 99. Specimens are in the collection of Mr. Shepherd; according to Stephens it has occurred at Whittlesea-Mere, and in Yorkshire. [Mr. Buxton met with this, in great abundance, at the beginning of August, 1854, on Rivington Pike, near Bolton le Moors.]

PHLÆODES CRENANA, Hübner; first enumerated as British in Stephens's Museum Catalogue, at page 36. It has been taken in Scotland by Mr. Weaver.

ANCHYLOPERA UPUPANA, Treit.; first noticed as a British species in the Proceedings of the Entomological Society for April, 1849, when "Mr. Douglas stated that Mr. H. Doubleday had informed him, that last year he had bred the *Phoxopteris Upupana* of Hübner, a very rare species of *Tortricidæ* and new to this country." The insect has since occurred at Darenth Wood, Black Park, near Hastings, Epping, &c., but still continues rare.

ANCHYLOPERA COMPTANA, Frölich; first recorded as British by Mr. Douglas, in the Entomologist, at page 385, under the name of *A. cuspidana*. "This pretty little moth is, I believe, new to Britain; it is a very different thing from the insect figured under this name in Wood's Index; taken at Riddlesdown." It is figured and described as *A. cuspidana* in Humphrey's and Westwood's British Moths, vol. ii. page 132, pl. lxxxv. fig. 15. On the chalk downs at Sanderstead and Mickleham this insect occurs in the greatest profusion. Last spring it was on the wing as early as the 14th of April. It is double-brooded, the second brood appearing in August.

BACTRA NIGROVITTANA, Stephens; first enumerated and described in Stephens's Museum Catalogue, at page 40 and 99. It is uniformly smaller than *B. lanceolana*, and does not appear to vary at all; I have seen several specimens from different localities in Scotland.

PŒCILOCHROMA OPPRESSANA, Treit.; first enumerated as British in Stephens's Museum Catalogue, at page 43; Mr. Doubleday writes me—"I have a pair taken in our forest. I have never seen any other British specimens."

PŒCILOCHROMA OCCULTANA, Douglas; first recorded and described by Douglas in the Zoologist for 1846, at page

1267; a figure of it is given on the next page—"I have three specimens of this insect, two taken at Birch Wood, on the 2nd of July, and one at Weybridge in June, all out of fir trees." It has since been repeatedly taken among firs and larches, and is now in most collections.

PŒCILOCHROMA SIGNATANA, Douglas; first recorded and described by Douglas as *Sericoris signatana*, in the Zoologist for 1845, page 844—"I beat three or four specimens of this species out of a hedge at Sanderstead Downs, July 9th, 1843." It has since been frequently taken at Sanderstead and Mickleham, and has also been bred by Mr. Weir "in a cage containing leaves from several plants." Zeller bred it from *Prunus Padus*.

PŒCILOCHROMA STABILANA, Stephens; first enumerated and recorded in Stephens's Museum Catalogue, at pages 45 and 100. In the Zoologist for 1852, page 3584, Mr. Doubleday remarks, that he "first noticed this insect last autumn, in a box from Yaxley; it struck me as having a peculiar appearance, and I thought it might prove a distinct species; it differs considerably in form from *Solandriana*, the wings being broader, in this respect resembling *sordidana*, but it is destitute of the peculiar glossiness of that species; it feeds upon *Myrica Gale*.

HALONOTA CIRSIANA, Zeller; first enumerated as British in Doubleday's Catalogue, page 25. The larva feeds in the stems of thistles (*Cirsium palustre*), and may be found there during the winter.

HALONOTA NOVANA, Guenée; first enumerated as British in Doubleday's Catalogue, at page 25; Mr. Doubleday now writes me, "*H. novana* is, I believe, merely a variety of the ♂ *Scutulana*."

HALONOTA TURBIDANA, Treit.; first recorded as a British species, described and figured, by Logan in the Zoologist for 1848, page 2034; the larva, no doubt, feeds in the flower

stems of the butter-bur (as *H. Brunnichana* feeds in the flower stems of the coltsfoot). I found the perfect insect at Chudleigh, Devon, in June, 1850, in some plenty among the butter-bur (*Petasites vulgaris*).

SEMASIA RUFILLANA, Zeller; first enumerated as British in Doubleday's Catalogue, at page 25; it had previously been confounded with *Ianthinana*, under the name of *Lediana*; it occurs at Sanderstead Downs and Headley Lane.

COCCYX COSMOPHORANA, Treit.; first recorded as British by Mr. Doubleday, in the Zoologist for 1847, at page 1884, having been captured by Mr. Hodgkinson, in Scotland; a few specimens have since been taken in Scotland.

COCCYX STROBILELLA, Linn.; first recorded as British in the Proceedings of the Entomological Society for June, 1849, when Mr. Douglas exhibited specimens, as did also Mr. Shepherd, he having reared one from cones of spruce fir; "the larva had fed in the centre" of the cone, and "changed to a pupa, about two inches from the apex." An account of the habits of the larva and pupa is given by Mr. E. Shepherd, in the Zoologist for 1850, page 2748. The insect has since been bred abundantly, and is now in all collections.

COCCYX FINITIMANA, Guenée; first enumerated as British in Doubleday's Catalogue, at page 25; several specimens of this have been met with in Scotland, by Mr. Weaver, Mr. Hodgkinson, and other collectors.

COCCYX PYGMÆANA, Hübner; first enumerated as British in Stephens's Museum Catalogue, at page 51, but it would appear that this was the species described by Haworth as *subsequana*. "Posterior wings whitish, with the apex broadly fuscous." "Imago in April."

On the Continent the species frequents pine trees, from the end of March to May. The larva feeds on the pine leaves in July.

Coccyx nanana, Treit.; first recorded as British, and described by Douglas, in the Zoologist for 1846, at page 1267, under the name of *Sericoris tenebrosana;* it is also figured at page 1268. The species is excessively abundant among spruce firs, and it seems incredible that it should have previously been entirely overlooked in this country.

Coccyx Vacciniana, Tischer; first recorded as British by Mr. Chant, in the first volume of the Entomological Magazine, page 181, in a notice of an "Entomological Tour in South Devon, by Messrs. Chant and Bastley." "May 31st, took a new *Tortrix*, for which we propose the name *Myrtillana;* we beat it out of the *Vaccinium Myrtillus*, which was growing in abundance." Under this name, *Sericoris Myrtillana*, it is described and figured in Humphrey's and Westwood's British Moths, vol. ii. page 146, pl. lxxxix. fig. 15. It has recently been taken among the bilberry in the north of England, in great plenty.

Retinia Turionella, Linn.; this, the *true Turionella*, was first recorded as British by myself, in the Zoologist for 1848, page 1990.—"I only know of one specimen, which was taken by the Rev. W. Johnson, off a fir tree, at Birch Wood, several years ago." Several specimens have since been taken at West Wickham Wood, and it has also been bred by Mr. Waring. The larva feeds in the young shoots of the Scotch fir, and the crippled distorted appearance they assume in *April* betrays the presence of the larva. The larvæ of *Buoliana* and *pinicolana* do not distort the shoots in which they feed, till *May* and *June*.

Retinia sylvestrana, Curt.; first recorded and described by Curtis in the Annals and Magazine of Natural History, 2nd series, vol. v. page 111.—"It was first discovered by Mr. Dale, at Bournemouth, and from the 23rd June to the 1st July, we found it there in 1846. It inhabits

the pinasters on the cliffs. It has been distributed amongst Entomologists by the name of *duplana*."

OPADIA FUNEBRANA, Treit.; first recorded as a British species by myself, in the Zoologist for 1848, page 1989. I have two specimens, and I believe a few others have been since met with. The larva feeds in the interior of plums, and is very common, as those who are in the habit of preserving plums well know.

EPHIPPIPHORA FLORICOLANA, Hübner; first recorded as British, also described and figured, in Humphrey's and Westwood's British Moths, vol. ii. page 126, pl. lxxxiii. fig. 20, as *Pseudotomia notata*, having been "taken by Mr. Bentley, near Woolwich." The species has since been taken freely at Plumstead, among maples, and is now in most collections.

EPHIPPIPHORA WEIRANA, Douglas; in the Proceedings of the Entomological Society for February, 1850, we read—"Mr. Douglas exhibited a new species of *Tortrix*, allied to *Stigmonota redimitana*, Guenée; which he proposed to call *Weirana*." The species is described in the Proceedings of the Entomological Society for April, 1850, where we are informed that it was "taken at the end of May, flying in sunshine round beech-trees at Mickleham."

EPHIPPIPHORA CONIFERANA, Ratzb.; first recorded and described as British by myself in the Zoologist for 1848, page 1988. The species in not uncommon in the north of England and Scotland, and has occurred occasionally in the south.

DICRORAMPHA SENECTANA, Guenée; first distinguished as a British species by Mr. Doubleday, and enumerated in his Catalogue at page 26. Its capture is first recorded by Mr. Sircom in the Zoologist for 1851, page 3287; this and the four following species form a very puzzling little group,

and a collector rarely identifies his captures without much trouble.

DICRORAMPHA ACUMINATANA, Zell.; first enumerated as British in Doubleday's Catalogue, at page 26, as *Dicrorampha caliginosana*. It has occurred at Charlton, near Bristol, and at Mickleham, in August. From the latter locality Mr. Douglas exhibited specimens at the September meeting of the Entomological Society in 1851.

DICRORAMPHA SATURNANA, Guenée; first distinguished as a British species by Mr. Doubleday, and enumerated in his Catalogue at page 26.

DICRORAMPHA PLUMBAGANA, Treit.; first distinguished as a British species by Mr. Doubleday, and enumerated in his Catalogue at page 26.

DICRORAMPHA ULICANA, Guenée; first distinguished as a British species by Mr. Doubleday, and enumerated in his Catalogue at page 26.

DICRORAMPHA CONSORTANA, Stephens; first recorded in the Proceedings of the Entomological Society for September, 1851, when "Mr. Douglas exhibited an apparently new species of *Stigmonota*, taken at Headley Lane, August 10th." In Stephens's Museum Catalogue it is enumerated and described as *D. consortana*, at pages 60 and 100. It may be said to resemble a small dark *Ephippiphora Leplastriana;* it is yet in few collections.

CATOPTRIA WIMMERANA, Treit.; thus noticed by Mr. Douglas in the Entomologist, at page 384—"*Carpocapsa* ———, a new species allied to *C. pupillana*, but abundantly distinct. Taken on the sea wormwood near St. Osyth, but very local." In Humphrey's and Westwood's British Moths, vol. ii. p. 138, it is described as *C. maritima*. It has been frequently taken since by collectors on the coast, and is now in most collections. The *Grapholita lacteana*, enumerated

as a distinct species in Stephens's Museum Catalogue, I believe to be only a variety of this.

CATOPTRIA MODESTANA, H.-S.; first recorded as British by Mr. Douglas, in the Zoologist for 1851, page 3129, among insects occurring at Charlton Pit—"*Catoptria* ———; a new species, probably either *decolorana* or *modestana* of Herrich-Schäffer. I found it here last August." It is not very uncommon at Charlton, but I am not aware that it has occurred elsewhere.

CATOPTRIA CŒCIMACULANA, Hübner; first enumerated as British in Doubleday's Catalogue, at page 26. The insect is not at all uncommon at Mickleham and in other localities on the chalk in July.

CATOPTRIA CITRANA, Hübner; first enumerated as British in the preface to the Zoologist for 1847, page 11; its capture at Southend, Essex, in July, 1848, is recorded by Mr. Hodgkinson in the Zoologist for that year, at page 2330. It is a very conspicuous distinct species, and the wonder is that it was not previously known as a British species.

CNEPHASIA CONSPERSANA, Douglas; described by Douglas in the Zoologist for 1846, page 1267, and figured on the following page. Mr. Douglas "took three specimens on the salt marshes, near St. Osyth, Essex, in July, 1847."

CNEPHASIA CRETACEANA, Curtis; described and recorded by Curtis in the Annals and Magazine of Natural History, 2nd Series, vol. v. p. 112—"I never met with this insect but once, and then in abundance on the paling round Dover Castle, in July, 1829."

ERIOPSELA QUADRANA, Hübner; first described as British by Douglas in the Zoologist for 1846, page 1269, as *Orthotœnia quadrana*. "The locality of Sanderstead Downs there given is erroneous; it should be Darenth Wood, and the date May instead of July."—J. W. D.

CLEPSIS RUSTICANA, Treit.; first enumerated as British in Doubleday's Catalogue, at page 24; the species has occurred on boggy moors in Scotland, and in plenty in the fens of Cambridgeshire. It is now in most collections.

EUCHROMIA ARBUTELLA, Linn.; first enumerated as British in Doubleday's Catalogue, at page 23; the insect has been taken rather freely by the collectors who have visited Scotland, and is now in most collections.

ORTHOTÆNIA ERICETANA, Bentley; (*trifoliana*, Zeller, in Doubleday's Catalogue). First recorded, described and figured in Humphrey's and Westwood's British Moths, vol. ii. p. 150, pl. xci. figs. 3, 4. A subsequent capture in the Isle of Wight by Mr. Bentley is recorded in the Zoologist for 1847, page 1803. The insect has also occurred in Scotland, and has been taken near Bristol, by Mr. Allen Hill.

SERICORIS HERBANA, Guenée; enumerated as British in Doubleday's Catalogue, at page 23. I have never seen any specimens that appeared distinct from the common *lacunana*.

SERICORIS EUPHORBIANA, Dup.; enumerated as British in Stephens's Museum Catalogue, at page 74; an old specimen is in the collection of Mr. Shepherd. It is a common continental species; the larva feeding on *Euphorbia aquatica*.

SERICORIS LITTORALIS, Curt.; first recorded, described and figured in Humphrey's and Westwood's British Moths, vol. ii. p. 143, pl. lxxxviii. fig. 13, having been "taken on the southern coast of England, by Messrs. Dale and Curtis." It was described by Douglas, in the Zoologist for 1846, at page 1269, under the name of *Orthotænia venustana*. I have received the species from Belfast, and Mr. Stevens has bred it from larvæ feeding on *Statice armeria*, below Gravesend.

MIXODIA PALUSTRANA, Lienig; first recorded as British by Mr. Curtis, in his British Entomology, fol. 364, as *Or-*

thotœnia cespitana: "18th June, Heath, side of a hill, Amble-side; and 14th July, amongst fir-trees, Black-wood, Loch Rannoch." I have several times taken the insect among fir-trees, in Torwood, Stirlingshire, and it has been taken by others collecting in Scotland.

MIXODIA TENERANA, Dup.; first recorded as British, and also described and figured, in Humphrey's and Westwood's British Moths, vol. ii. page 172, pl. xcix. fig. 10, as *Orthotœnia pinetana.* It does not seem at all uncommon among fir trees throughout the country. It was first "taken in Dorsetshire, by Mr. Dale."

LOBESIA SERVILLANA, Dup.; first enumerated as British in Doubleday's Catalogue, at page 26; it is a scarce species, but occurs at Epping on Sallows, and also in the fens.

LOBESIA SIMPLANA, F. v. R.; first enumerated as British in Doubleday's Catalogue, at page 26; it has been taken at Darenth Wood, and in the fens, but is rare.

CHROSIS AUDOUINANA, Dup.; described and figured as *Argyrotoza apicalis* in Humphrey's and Westwood's British Moths, vol. ii. page 169, pl. xcviii. fig. 8, having been "taken by Mr. Bentley, in July, at Tonbridge." In the Zoologist for 1846, page 1268, it is described by Douglas and figured, under the name of *Argyrotoza Audouinana.* Mr. Douglas "took two specimens at Black Park, on the 28th of June, 1845;" and it has since been taken in the same locality, and near Epping, but still continues rare, and is in few collections.

CHROSIS RUTILANA, Hübner; first recorded as British, described and figured by Newman, in the Zoologist for 1845, at page 807—Mr. Bedell having "on the 7th of July, 1844, while beating the juniper trees, on Sanderstead Downs, for *Macrochila marginella,* obtained five specimens of" this insect. It is very common among the junipers at Sanderstead and Stoat's Nest; the larva feeds on the juniper berries.

Since the re-discovery of this species, it has been identified as the *Tinea sanguinella* of Haworth.

ARGYROLEPIA SCHREBERSIANA, Frölich; first enumerated as British in Doubleday's Catalogue, at page 27; a single specimen, taken at Yaxley by Mr. Bouchard, is in the collection of Mr. E. Shepherd. [Another specimen, probably from the Norfolk fens, is in the collection of Mr. Buxton.]

ARGYROLEPIA MUSSEHLIANA, Treit.; first enumerated as British in Doubleday's Catalogue, at page 27; a specimen has been taken by Mr. Weaver, in the west of England.

ARGYROLEPIA CNICANA, Doubleday; first enumerated as British in Doubleday's Catalogue, page 27. It has much resemblance to *badiana*, with which it has probably long been confounded, but frequents thistles, whereas the larva of *badiana* feeds in the stems of burdock. It may readily be distinguished by the narrower central fascia of the anterior wings not expanding on the inner margin, and being paler coloured.

EUPŒCILIA ATRICAPITANA, Stephens; first noticed as British by myself, in the Zoologist for 1848, at page 1990, as *E. dubitana;* recorded as being taken at Charlton, in July and August, by Mr. Douglas, under the name of *Eupœcilia* ———, in the Zoologist for 1851, page 3129.

It is described in Stephens's Museum Catalogue, at page 103, under the name of *atricapitana*.

EUPŒCILIA CARDUANA, Zeller; first enumerated as a distinct British species in Stephens's Museum Catalogue, at page 81; Doubleday having given it as a synonym for *Sodaliana*, from which it differs in the central fascia being more oblique; it was formerly taken by Mr. Sircom near Bristol, and is not uncommon in the Hilly Field at Headley Lane. The true *Sodaliana* appears very scarce.

EUPŒCILIA AFFINITANA, Douglas; first recorded and

described by Douglas in the Zoologist for 1846, at page 1269, a figure being given on the preceding page. Mr. Douglas says—"This moth I found on the salt marshes near St. Osyth, Essex, on the 8th of July, 1845. It is nearly related to *C. griseana*, Haworth; and to *C. Vectisana*, Westwood, whence the name I have given it."

Eupœcilia Vectisana, Westwood; first recorded, described and figured in Humphrey's and Westwood's British Moths, vol. ii. p. 176, pl. c. fig. 15, from specimens "taken in a salt marsh, near Ryde, in the Isle of Wight, flying over the grass, in the evening of the 5th of August, 1843, by S. Stevens, Esq." Doubleday gives this as a doubtful synonym for the preceding; Stephens gives them as doubtfully distinct. The similarity of locality favours the idea of their being identical; future observation must decide the point.

Eupœcilia notulana, Zeller; the first record of its capture in this country is from the pen of Mr. Allen Hill, in the Zoologist for 1850, page 2883—"*Eupœcilia notulana*; beginning of July, flying at sunset by the side of ditches, in marshes and old fish ponds, over *Carex paludosa*; numerously." At page 2956 of the same volume, Mr. Allen Hill gives the further observation—"It flies for a very brief space of time at sunset (say ten minutes), and as it is rather numerous with me in its habitat, I should fancy it must have escaped the notice of collectors so long chiefly from that circumstance."

Eupœcilia Anthemidana, Curtis; bred by Mr. Curtis from the flower head of *Anthemis Cotula*, but I believe not hitherto anywhere recorded. It is readily distinguished by its size, being much less than *E. nana*. I have a specimen I took at Charlton Sand Pit, August 20th, 1849.

Eupœcilia flaviciliana, Doubleday; first enumerated in Doubleday Catalogue, page 27. I believe it is still un-

described; the most striking character is the yellow cilia of the anterior wings. Mr. Douglas has a specimen taken at Sanderstead.

LOZOPERA DILUCIDANA, Stephens; first enumerated as a distinct species in Stephens's Museum Catalogue, at page 84. It is the *Francillana* of most collections, the *true Francillana*, in which *the first fascia is entire*, and *not interrupted towards the costa*, being comparatively rare. Mr. Douglas has bred *dilucidana* from the stems of the wild parsnip (*Pastinaca sativa*).

Of the following *Tortricina*, enumerated in Stephens's Museum Catalogue as *British species*, I am unable to give any satisfactory information: therefore I think it more advisable to omit them for the present; should they hereafter prove to be distinct, I shall have much pleasure in introducing them in subsequent years.

Antithesia sororculana, *Spilonota alnetana*, *Grapholitha excruciana*, *Pamplusia alticolana*, *Ephippiphora Lathyrana*, *E. Heegerana*, *E. fissana*, *Catoptria asseclana*, *C. æmulana*, *Cnephasia perterana*, *C. perplexana*, *C. incanana*, *Argyrotænia cognatana*, *A. fuscociliana*, *Sericoris Dormoyana*.

In the foregoing enumeration of novelties since 1835, I have not mentioned the few new *Crambina* which are already noticed in my "Systematic Catalogue;" and with reference to the *new Tineina*, which include nearly half our present species, I am compelled by actual want of space to refer the reader to the Insecta Britannica—Lepidoptera Tineina, where they will find all the information that I possessed at the close of 1853.

THE NEW BRITISH SPECIES IN 1854.

ANTHROCERA MINOS, W. V.; (see frontispiece, fig. 1*); first recorded as British in the Zoologist for last January, page 4180, by Mr. Newman—"I am informed by my friend, Mr. Thomas H. Allis, that about a dozen specimens of *Zygæna Minos* were taken last summer on the west coast of Ireland, by Henry Milner, Esq., of Nunappleton, near York." On the 27th of last June, Mr. A. G. More sent me a number of specimens for distribution among the members of the Entomological Society; and in his letter dated from Ardrahan, he says, "the *Anthrocera* is quite plentiful about here, but the weather has been so bad, that I have found some difficulty in procuring really good specimens. It appears about a fortnight earlier than the spotted species (*Filipendulæ*). I first captured it in 1851, but did not recognize its value until I saw some of Mr. Milner's specimens at Doncaster. I believe his locality was in Clare, and mine is in Galway, which shows the range of the species may be somewhat extensive in these parts." This is readily distinguished from our other British species, the anterior wings having three *elongate* red marks, and not round spots; on the Continent several species are marked in this way, and it is very possible some of these may be found in this country. I mention this to show, that if a collector meets with an *Anthrocera* with the three elongate red marks, it does not follow, as a matter of course, that it will be *Minos*.

PETASIA NUBECULOSA, Esper. A specimen of this, taken by Mr. Cooper at Rannoch last spring, is in the

* Expands 1¼ inch: the figure is slightly magnified.

collection of Mr. Hodgkinson. Allied to *Cassinea*, but larger and darker, the anterior wings being "brown grey, mixed with reddish grey," according to Treitschke, who says, that "the larva feeds in May and June on birch and elm," and that "the perfect insect is found on the trunks of trees, in early spring, simultaneously with *Ceropacha flavicornis*."

SPÆLOTIS VALLESIACA, H.-S. (fig. 80; not of other authors); (see frontispiece, fig. 2*), has been taken by Messrs. Carter, Evans, N. Cooke, C. S. Gregson, &c., in Wales, at the end of July. Mr. Carter informs me, this *Noctua* is found "all along the coast of North Wales, commencing in Flintshire, near the Vale of Clwyd, and thence in Denbighshire, adjoining Carnarvonshire, in Llanrwst, also at the foot of Snowdon." Mr. Carter "found it stretching itself on stunted plants, and also sitting upon the face of rocks."

There appears to be some confusion with regard to this species amongst the Continental writers; hence I am unable to quote it as the *Vallesiaca* of Boisduval. The *Vallesiaca* of Freyer and Guenée it most certainly is not, for their species has in the male pure white underwings.

The insect is not very nearly allied to any of our previously known British species.

MIANA EXPOLITA, Doubleday, n. sp.; taken by Messrs. Law and Sang near Darlington. Mr. Law writes—"We observed it in great numbers flying in the hot sunshine about the middle of July, but did not take many." The species may be readily known, being *much smaller* and darker than *fasciuncula*, and *extremely glossy*; the posterior wings are unicolorous grey, with pale grey cilia; the shape of the anterior wings is also very distinctive, the hinder margin not being elbowed as in *fasciuncula* and *strigilis*.

* Expands 1½ inch: the figure is slightly magnified.

EUBOLIA MÆNIATA, Scopoli; (see frontispiece, fig. 3*). A specimen of this is in the collection of Mr. C. S. Gregson, who "obtained it from Mr. Reeves of Carlisle, many years ago, along with a poor *depuncta;* Mr. Reeves told Mr. Gregson he took it himself on one of the high hills near Baron Wood." The larva feeds on broom at the end of May, the moth appearing in July. Readily distinguished from our other British species; it comes nearest to *mensuraria*, but the blueish-slaty colour of the anterior wings, the straightness of the anterior margin of the central fascia, the large projection from the middle of its posterior margin, and the yellow outlines of these margins, would readily enable any one to recognize it.

SIMAETHIS PARIETARIÆ, Stainton, n. sp. At the end of July, Mr. Harding found a small larva feeding on the *Parietaria officinalis* at Deal, and forwarded some of them to me for examination; I had no conception, however, that they would have produced a *Simaëthis*, but anticipated a species of *Butalis*. In the month of August, the perfect insects made their appearance, and are so excessively like *S. Fabriciana*, that I have not yet been able to detect any essential character in the markings; it is, however, a decidedly *smaller* and *darker* insect, and the costa of the anterior wings is a little more bowed. From this circumstance, and the unusual food-plant, I think it better to announce the species as distinct, thereby calling attention more prominently to it, and leaving it to future observers to *decide* on its specific distinctness.

EUDOREA ATOMALIS, Doubleday, n. sp.; taken by Mr. Weaver, in Scotland; expands 8½ lines; it is allied to *E. ambigualis*, but rather smaller and darker. The anterior wings are fuscous, with darker markings, and with some scattered whitish scales towards the base, on the disc,

* Expands 1⅜ inch: the figure is a little magnified.

and forming the hinder white fascia; there are also a few towards the hinder margin; *the cilia are fuscous.* The posterior wings are rather pale fuscous, *thus much darker than the whitish grey posterior wings of E. ambigualis.*

EUDOREA GRACILALIS, Doubleday, n. sp.; taken by Mr. Weaver, in Scotland; expands 9—10 lines; not very nearly allied to any of our known species: the anterior wings have a peculiarly delicate appearance; they are very narrow at the base, gradually widening to a little before the apex; the hinder fascia runs obliquely inwards from the costa, as in *E. lineolea;* before the hinder margin are several black spots; cilia pale fuscous, with paler patches; the posterior wings are pale greyish-fuscous, with paler cilia.

CRAMBUS CASSENTINIELLUS, Mann; a single specimen of this species, from the collection of Mr. Hemmings, was exhibited at the October meeting of the Entomological Society; it was taken on the downs near Brighton, a few years back.

The species is very closely allied to *C. rorellus,* and like it is at once distinguished from *C. chrysonuchellus by the greater length of the palpi;* the *brighter* markings of the anterior wings also readily distinguish it from *C. chrysonuchellus.* The species is described by Zeller in the Ent. Zeitung, 1849, page 312.

RETINIA RESINELLA, Linn.; bred freely from larvæ collected in Perthshire last summer, by Mr. Bouchard. The larva feeds in autumn and spring, in the resinous exudations which it causes on the twigs of *Pinus sylvestris.* The perfect insect is allied to *R. pinivorana,* but the anterior wings are darker, without the reddish tinge of *pinivorana,* and considerably broader.

GELECHIA VISCARIELLA, Logan, n. sp.; bred by Mr. Logan from larvæ, feeding in April and May, on the shoots of *Lychnis viscaria;* it is closely allied to *G. fra-*

ternella, but the anterior wings are much darker, being dark fuscous, not reddish-brown, and the opposite spots are whiter and narrower.

Alis anticis *saturate fuscis*, maculis tribus obscure saturatioribus, maculis posticis oppositis albidis *tenuibus*. Exp. al. 5 lin.

Head dark purplish-fuscous. Face dull whitish. Palpi internally whitish, second joint beneath *dark fuscous;* terminal joint dark fuscous, with the tip whitish. Anterior wings dark fuscous, with a very faint purple tinge, with three obscure darker spots longitudinally on the disc, and with a few scattered pale scales; beyond the middle are two opposite, *narrow, pointed whitish* spots, almost forming a slightly angulated fascia; the apex of the wing is dark purplish fuscous, with paler cilia. Posterior wings pale grey, with greyish fuscous cilia.

YPSOLOPHUS JUNIPERELLUS, Lin.; the *true Juniperellus* is at length a British species, having been bred by Mr. Edwin Shepherd, from larvæ collected on the juniper, in Scotland, Mr. Bouchard. The larva forms webs on the twigs of the *juniper*, just as that of *marginellus* does. (Ins. Brit. 145; Ent. Com. 57.) The anterior wings show considerable resemblance to *Gelechia Galbanella*, from which the long tuft of the second joint of the palpi instantly distinguishes it.

Alis anticis fuscescenti-griseis, punctis quatuor saturate fuscis, nebula fusca pone medium, fascia postica fere recta dilutiore. Exp. al. $8\frac{1}{2}$—9 lin.

Head and face grey. Palpi internally grey, tuft of the second joint beneath and externally dark fuscous; terminal joint grey, the extreme tip a little darker. Anterior wings grey, slightly suffused with fuscous, with four dark fuscous spots, one near the base above the fold, one on the fold before the middle, one on the disc in the middle, and one on the disc beyond the middle; this last is placed at the commencement of a fuscous fascia-form cloud, beyond which is a pale, nearly straight, serrated fascia; the apical portion of the wing is suffused with fuscous, with a series of dark fuscous spots on the margins; cilia pale grey. Posterior wings pale greyish-fuscous, with paler cilia.

RÖSLERSTAMMIA PRONUBELLA, W.V.; a single specimen of this very conspicuous species was taken at Sutherlandshire, in May last, by Mr. Buxton; its capture is recorded in the Zoologist, page 4437. The insect is very rare on the Continent; and though known to the authors of the Wiener Verzeichniss, and Fabricius who mis-spells it *promulella*, it had been quite lost sight of by later authors (unless we except Hübner, whose figure, it is most charitable to suppose, was made from a description, form and colour both being so excessively faulty), till lately it has been noticed by Herrich-Schäffer and Reutti. The extraordinary way in which some species seem entirely to disappear, and then, after a lapse of many years, simultaneously turn up in many distant localities, is one of the great marvels of Entomology.

Alis anticis viridi-aureis, costa ipsa in medio dilute lutea; *alis posticis dilute luteis griseo-fimbriatis.* Exp. al. 6½ lin.

Head dark yellow, in front deep purple. Face and palpi pale yellow. Antennæ dark fuscous, a short space before the apex white. Anterior wings shining golden green, darkest towards the base near the costa; the costa, from a little before the middle to beyond the middle, is pale yellowish; cilia pale greyish bronze. *Posterior wings pale yellowish, with all the margins rather dark fuscous,* darkest towards the apex; cilia pale grey. Posterior legs pale yellowish white.

COLEOPHORA LIMOSIPENNELLA, F. v. R.; bred this summer from "elm leaves, picked at Sutton, with the *large Coleophora* of the elm (*limosipennella?*)" (Ent. Comp. 127); and also from similar larvæ on alder, thus noticed in Ent. Comp. 133: "Aug. 23rd, T. B. sent me two *Coleophora* larvæ from alder, the cases similar to those of *C. limosipennella?*" In July, 1854, I collected the larvæ very plentifully on elms, near the Bee-hive at Burford Bridge. The species in the perfect state closely resembles *C. badiipennella,* but is larger and darker, and the whitish

apex of the antennæ is generally unannulated. The case of the larva is *very different*.

Alis anticis *saturate brunneo*-ochreis, costa anguste albida, postice ochrea; antennis albis, fusco-annulatis, articulo basali ochreo, non penicillato. Exp. al. 5—6 lin.

Head, face and palpi pale ochreous. Antennæ white, annulated with fuscous; the basal joint pale ochreous, hardly as robust as in *badiipennella*; the extreme apex is frequently entirely whitish, without annulations. Anterior wings *dark brownish*-ochreous, the costa narrowly whitish to beyond the middle (*yet more broadly* and *less sharply margined* than in *badiipennella*); cilia ochreous, inclining to fuscous towards the anal angle. Posterior wings greyish fuscous, cilia rather darker.

GONIODOMA AUROGUTTELLA, F. v. R. (See frontispiece, fig. 4.) A single specimen was taken by Mr. S. Stevens, in the Isle of Wight, last August, on the banks of the Yar, near Yarmouth, by sweeping the herbage. The larva (figured in Fischer) feeds in an angulated case on the seeds of *Atriplex* (its case resembling in form and colour the rhomboidal perigone of the fruit); in autumn, when the larva is full fed, it attaches its case to the lower part of the stem of the food plant, and boring into the interior, spins a white silken cocoon there, leaving its case attached to the exterior of the stem; it remains unchanged in this cocoon during the winter, but in spring it assumes the pupa state, and the perfect insect appears in July. According to the observations of Fischer and Mann, it frequents only those plants which grow in very sheltered situations.

Alis anticis luteis, strigis duabus argenteis altera costæ, altera plicæ, tertia abbreviata disci, maculis quinque dilute aureis pone medium, atro-squamatis. Exp. al. $4\frac{1}{2}$ lin.

Head, face and palpi whitish. Antennæ white, annulated with black, the tip of the yellowish basal tuft fuscous. Anterior wings yellow, with two silvery streaks from the base to beyond the middle, one along the costa and one along the fold; between these is a shorter streak in the middle of the wing; beyond the middle are five or six pale golden spots,

several of which are margined by black scales; cilia of the costa pale yellow, of the hinder margin fuscous, with a black apical streak. Posterior wings pale grey, with paler cilia.

ELACHISTA POÆ, Douglas, n. sp. The larva is not uncommon in the leaves of *Poa aquatica* in April and August, but is very apt to be ichneumoned. The mined places are very long and narrow, and only slightly discoloured; thus very dissimilar to the broad whitish mines made in the leaves of *Arundo phragmites* by the larva of *E. cerusella*. The first notice that appeared of this insect was in the Zoologist for 1853, at page 4142, in an observation by Mr. Miller "On the habits of *E. cerusella:*" the insect having been mistaken by Mr. Miller for the other sex of *E. cerusella;* a mistake not unnatural, when we consider the simultaneous appearance of the two species in the same localities. Mr. Douglas found the larvæ in Greenwich Marshes in August, 1853, but all the specimens then found were ichneumoned. Last spring it was found at Southend, Greenwich, Hackney, &c., and, no doubt, is generally distributed, though hitherto so completely overlooked.

It is an obscure dingy insect, and has most resemblance to *E. Kilmunella* and *atricomella;* from the former it may be distinguished by the first fascia going obliquely outwards from the costa, and by the posterior position of the dorsal spot; the latter is also the best character to distinguish it from *E. atricomella*, which is a *blacker* insect, without the lossy appearance of *E. Poæ*.

Alis anticis *nitidis fuscis*, pone medium saturatioribus, fascia angulata ante medium, maculis oppositis pone medium (*dorsali posteriori*) albidoluteis, *obsoletis*. Exp. al. 4½ lin.

Head, face, palpi and antennæ fuscous. Anterior wings *shining dingy fuscous*, darker beyond the middle; before the middle is a slightly angulated obscure pale fascia (going obliquely outwards from the costa);

beyond the middle are two yellowish-white opposite spots, *of which that on the inner margin is rather posterior;* both are frequently excessively indistinct; cilia, beyond a dark hinder marginal line, greyish-fuscous. Posterior wings greyish fuscous, with paler cilia.

The female is larger, expanding $5\frac{1}{2}$ lines, and the fascia and spots are more distinct.

ELACHISTA GREGSONI, Stainton, n. sp. Bred by Mr. C. S. Gregson from *black-headed, greenish-grey* larvæ, found in a species of *Poa* near Liverpool last March.

It is closely allied to *E. nigrella*, but the larva is very different, and in the female the two opposite spots are more exactly opposite.

Alis anticis (♂) nigrescentibus, fascia tenui ante medium, maculis oppositis pone medium, apiceque ipso albidis, obsoletis; (♀ alis anticis nigris, basim versus dilutioribus, fascia ante medium fere recta, maculis oppositis distinctissimis, fasciam alteram *rectam* fere formantibus). Exp. al. $3\frac{1}{2}$ lin.

Head greyish fuscous. Face and palpi whitish. Antennæ dark fuscous. Anterior wings blackish, with a slender whitish fascia before the middle; two opposite spots beyond the middle, and the extreme apex whitish; these markings are, however, very indistinct; cilia, beyond a dark hinder marginal line, pale grey. Posterior wings grey, with paler cilia.

The female has the anterior wings black, the basal portion only a little paler; the first fascia nearly straight, and the opposite spots, which are very distinct, almost form another *straight* fascia.

LITHOCOLLETIS VACCINIELLA, Scott, n. sp. The larva was discovered last May by Mr. Scott at Fochabers, Banffshire, and Mr. Weaver in Perthshire, mining the underside of the leaves of *Vaccinium Vitis Idæi*, and the perfect insect was bred the following month. It is a brilliant species, reminding one of *L. pomifoliella* and *L. Lantanella*, but readily recognised by the total absence of any white scales on the inner margin of the anterior wings, between the base and the first dorsal spot.

Alis anticis nitidis croceis, linea tenui basali, costam versus fusco-marginata, strigulis quatuor costæ, tribus dorsi, introrsum fusco-marginatis, albis nitidis, striola apicis elongata, atra; *squamis albis dorsi prope basim nullis.* Exp. al. 4 lin.

Head dark tawny. Face and palpi white. Antennæ fuscous. Anterior wings bright saffron-yellow, with a narrow shining white basal streak, dark margined towards the costa, and with four short costal streaks, and three dorsal streaks shining white, internally dark margined; *between the first dorsal streak and the base of the wing the usual white scales on the inner margin are totally wanting;* in the apex is an elongate black spot, round which runs the dark hinder marginal line; cilia whitish. Posterior wings grey, with paler cilia.

LITHOCOLLETIS CAVELLA, Zeller. On the 11th of January, 1853, I bred a specimen from birch leaves collected at West Wickham; and not knowing to which species it should be referred I put it on one side for future investigation. Subsequently showing the specimen to Mr. Wilkinson he recognised it as an insect he was in the habit of taking on the Addington Road fence, and Mr. Douglas took many specimens there last spring. The species is rather conspicuous from its large size, and the first dorsal streak is less obliquely placed than usual, and frequently uniting with the short first costal streak forms an angulated fascia.

Alis anticis croceis, linea basali, *non obscure marginata,* strigulis quatuor breviusculis costæ, tribus longiusculis dorsi, introrsum fusco-marginatis, albis nitidis; prima dorsi ac prima costæ sæpe *fasciam angulatam formantibus;* striola apicis nigra. Exp. al. 4½ lin.

Head saffron yellow. Face and palpi white. Antennæ whitish. Anterior wings saffron yellow, with a shining white basal streak, *with no dark margins,* and with four short white costal streaks, and three longer dorsal streaks, internally dark margined; the first pair not unfrequently unite, and *form an angulated fascia;* above the apical black spot are a few white scales; beyond is the fuscous hinder marginal line; cilia pale ochreous. Posterior wings grey, with paler cilia.

NEPTICULA WEAVERI, Douglas, n. sp.; (see frontispiece, fig. 5); the larva was found by Mr. Weaver,

in Perthshire, last May, mining in the leaves of *Vaccinium Vitis-Idæi*, and *puckering* them, having a similar habit to *N. Septembrella*, and forming its cocoon within the leaf. Unfortunately many of the larvæ found were ichneumoned, and very few of the perfect insect were bred; it is a large conspicuous species, and may be readily known by the abbreviated broad oblique whitish fascia, from the costa before the middle, and the small whitish spot at the anal angle of the dark purplish black anterior wings.

Alis anticis saturate purpureo-nigris, fascia obliqua abbreviata ante medium, macula parva anali luteo-albis. Exp. al. 3½ lin.

Head and face ferruginous. Antennæ fuscous, the basal joint yellowish. Anterior wings dark purplish black: on the costa, before the middle, is an oblique broad pale yellowish spot reaching to the fold; on the inner margin at the anal angle is a smaller yellowish-white spot; cilia whitish. Posterior wings grey, with pale grey cilia.

NEPTICULA PRUNETORUM, Stainton, n. sp.; bred by Mr. Boyd, from *green* larvæ mining in sloe leaves, *making contorted visceriform mines, like N. viscerella*. Mr. Boyd found the larvæ near Loudwater, Bucks, in September, but only in one locality. The species to which it is most nearly allied are *N. plagicolella* and *Acetosæ;* from the former it is distinguished by the pale *bronzy* basal half of the anterior wings and the *black* head, from *Acetosæ* it is distinguished readily by the extreme brightness of the anterior wings, by the silvery fascia being *rather further from* the *apex*, and bordered internally by a *well-defined* black fascia.

Alis anticis dilute æneis, basim versus purpureo-tinctis, fascia media nigra, fascia postica argentea; capillis atris. Exp. al. 2 lin.

Head and face deep black. Antennæ black, basal joint white. Anterior wings with the basal half pale bronzy, at the extreme base with a purple tinge; in the middle is a well defined black fascia, followed by a straight moderately broad silvery fascia; the entire apex of the wing black; cilia blackish. Posterior wings pale grey, with dark grey cilia.

OBSERVATIONS ON BRITISH TINEINA.

(Supplementary to the Insecta Britannica—Lepidoptera, Tineina; and the Entomologist's Companion; 2nd Edition.)

Ochsenheimeria Birdella, I. B., p. 22. A description of the larva, and its mode of feeding, is given by Scott in last June's Zoologist, at page 4336; at the end of April I again observed the larva crawling on the tops of grass, probably when in the act of moving from a plant it had eaten to a fresh one.

Tinea arcuatella, I. B., p. 29. Mr. Cooper found the larvæ in fungi on birch trees, near Rannoch, in July; hence the species is double-brooded.

Tinea ochraceella, I. B., p. 37. Mr. Wailes visited Rannoch, and obtained some eggs of this species, which he left in Mr. Logan's care to rear in an ant's nest at Duddingstone. "Mr. Logan has reared the eggs, and finds the larvæ feed on the straws, leaves of pine, &c., of which the ants make their nests, so that they are true *Tineæ* in their habits."

Lampronia quadripunctella, I. B., p. 38. In May last, Mr. Logan wrote me—"I have to-day reared *L. quadripunctella* from wild rose; its larva is very similar to that of *L. Rubiella*, but not quite so red, being *rather* paler and browner."

Lamprosetia Verhuellella, I. B., p. 39. The larva feeds

in a case, on *Asplenium trichomanes* and *ruta-muraria*. Mr. Allis has a fine specimen found near York, in a room which opened into a fernery.

Incurvaria tenuicornis, I. B., p. 41. The specimens here described were both females; Mr. Tompkins has since met with a male, of which the antennæ are simple, only slightly pubescent. Mr. S. Stevens took a specimen at West Wickham Wood last June.

Micropteryx Calthella, I. B., p. 42. On the 13th of April, I bred this in a tin in which there were only a piece of decayed wood, a plant of *Dactylis*, and *a plant of Carex*. "Coming events cast their shadows before."

M. Salopiella, I. B., p. 44. A few specimens have occurred at West Wickham Wood.

Hyponomeuta plumbellus, I. B., p. 60. The larva, when very young, in the middle of April, eats the pith of the young shoots of the spindle, causing them to droop. It afterwards quits this retreat and feeds on the leaves.

Prays Curtisellus, I. B., p. 64, and E. C. 55 and 137. The idea here thrown out has been confirmed, the small leaf miners of the ash quit the leaves previous to their fall, and penetrate the young buds, where they feed on the inner bark during the winter, betraying their presence by holes in the outer bark, and "frass."

Depressaria nanatella, I. B., p. 86. The larva, discovered by Mr. Wing last April, mines the upper side of the young leaves of *Carlina vulgaris*, frequently seven or eight occurring on one plant; we found it on the steep ascent of Box Hill; I also noticed it near Torquay.

D. subpropinquella, I. B., p. 88. Mr. Wing found the larvæ, near Norwich, feeding indifferently on *Cirsium* and *Centaurea*; the specimens bred were all referable to *this species*.

D. Douglasella, I. B., p. 97. Mr. Boyd bred a single

specimen from a larva found on one of the *Umbelliferæ*, at Headley Lane, in June.

D. nervosa, I. B., p. 99. I found the splendid larva of this feeding on *Œnanthe crocata* last May, near Dawlish; Dr. Colquhoun bred it from pupæ found in the stems of the same plant, near Ardrossan.

Gelechia cuneatella, I. B., p. 110. Mr. Boyd bred two specimens of this species from larvæ found on willow, June 22nd, then nearly full fed.

G. desertella, I. B., p. 113; and *G. mundella*, I. B., p. 115. Mr. Gregson has bred both these from moss on the sandhills, but had not observed the larvæ. This hint, however, may be of assistance to others.

G. affinis, I. B., p. 115. The larva feeds on moss on a wall in my neighbourhood, from December to March.

G. domestica, I. B., p. 117. I found the larvæ of this feeding on moss, in company with *G. affinis*, at the end of March; previously the larva had not been distinguished from that of *G. affinis*, so that I know not how soon it begins to feed.

G. vulgella, I. B., p. 119. The larva feeds between united hawthorn leaves at the end of April, eating them half through, and so discolouring them.

G. luculella, I. B., p. 119. Mr. Wing found the pale greenish, black-spotted larva of this species on the 12th of February,* feeding in the decayed wood of a prostrate tree

* [This was a chilly, damp day, and it was whilst seeking for this larva that Mr. Wing contracted a cold, which suddenly brought the disease (diabetes), which must long have been lurking in his system, to a crisis. Fortunately for our science, that crisis did not prove immediately fatal, for the plates to the Insecta Britannica—Lepidoptera, Tineina, were not then put on the stone; it was, however, several weeks before Mr. Wing recovered sufficient strength to resume his occupations, but during the summer he succeeded in putting "the heads" on

in Hyde Park. This abnormal habit for a *Gelechia* larva resembling rather that of an *Œcophora* larva, is extremely interesting.

Gelechia solutella, I. B., p. 121. Several specimens have been taken by Mr. Bouchard, in Scotland, this summer, and are in Mr. E. Shepherd's collection.

G. tenebrella, I. B., p. 131. Mr. Gregson also bred this from moss, but without having observed the larva.

G. atrella, I. B., p. 134. Mr. Hogan bred this from *Anthyllis vulneraria*, and describes the larva as "pale blackish brown, without markings of any kind."

Parasia Metzneriella, I. B., p. 141. The fat whitish larva below the seeds of *Centaurea nigra*, found November 13th, 1853 (E. C. p. 140), has produced this species; it is not at all uncommon at Headley Lane.

Nothris Durdhamella, I. B., p. 148. From a letter I have received from Dr. Herrich-Schäffer, it appears that this *is* identical with *Ypsolophus Schmidtiellus*, of which "the larva feeds in May on *Origanum vulgare*, where it betrays itself by the curved leaves; on any alarm it hastily retreats to the earth."

Œcophora grandis, I. B., p. 159. Mr. Edleston has received several specimens of this insect from North Wales, and has distributed it in many collections.

the stones,—obtaining the ready co-operation of Mr. Tuffen West, who relieved him of a considerable portion of the labour by doing "the denuded wings." The two last plates of perfect insects and of larvæ were entirely done by my late talented friend, and he lived to hear the high encomiums passed on those plates by Professor Zeller, than whom probably no one was more competent fully to appreciate their value. Mr. Wing contributed the two Micro-Lepidopterous figures to the frontispiece of this annual, being assisted in the remainder of that plate by his father; but his sand was then nearly run, and early in the new year he was completely laid up: he died on the 9th of January, in the 28th year of his age. "So wise, so young, they say do ne'er live long."]

Perittia obscurepunctella, I. B., p. 178. This species was bred from the "larva discovered by Mr. Wing, making blotches in the leaves of honeysuckle in July, quitting the leaf when full fed, and changing to a singularly flat pupa," mentioned in the Ent. Comp. at page 63.

Cedestis Gysselinella, I. B., p. 190. A few more specimens of this insect have occurred in Scotland this summer.

Gracilaria phasianipennella, I. B., p. 199, and *G. quadruplella*, p. 200. Mr. Boyd found the larva of this insect in cones on the leaves of *Rumex acetosella*, from which he bred both the typical insect and the variety. Professor Zeller also found the larva on *Rumex obtusifolius*, and bred the typical insect. There is, therefore, no longer room to doubt that this is the species Hübner represented feeding on dock, and that Réaumur found feeding on sorrel.

Coleophora albicosta, I. B., p. 214. The larva has been found by Mr. Scott and by Mr. Law; it feeds on the *Ulex*, the case is attached to the stem when full fed, and much resembles an unexpanded bud; it appears to be made of the calyx of the plant.

Bedellia somnulentella, I. B., p. 226. It is very singular, but during the two last seasons this insect seems to have entirely disappeared, though so plentiful in 1852.

Laverna atra, I. B., p. 239. In August last, Mr. E. Brown wrote to me as follows—"I have bred the dark varieties of *L. atra* from apple shoots; this is a most destructive little wretch in apple grounds, owing to the fact of its mining in the bud, and in the alburnum of the *bearing spur* of the apple; it may be found in this situation during the winter. In early spring sickly-looking buds should be pulled off, in order to destroy this pest of the orchard." In confirmation of the idea that the dark variety may be a distinct species Mr. Brown adds—"Among the many scores

that I caught and bred from these trees, I never saw a light variety."

As the newspapers would say, *this information is important.*

Chrysoclista Schrankella, I. B., p. 242. Mr. Scott again found the larvæ near Renfrew, and also at Fochabers, Banffshire. Among the specimens bred two have occurred of a dark variety, in which the entire central orange patch is replaced by black (only a few orange scales being perceptible towards the inner margin, near the base, and immediately before the last costal white spot); this variety is therefore parallel to that of *C. Linneella*, and at first sight appears like a totally distinct species.

Chrysocorys festaliella, I. B., p. 248. Mr. Logan informed me last spring that Mr. Hardy had reared this from raspberry leaves.

Elachista Treitschkiella, I. B., p. 250; bred last summer by Mr. Boyd, Mr. Douglas and myself, from the dogwood miners mentioned in the Ent. Comp., p. 53, under *Lampronia* and *Incurvaria*. The larva may be found from July to October, and is common at Lewisham and Mickleham.

E. Gleichenella, I. B., p. 251. I found the larva of this in a grass and in a *Carex* near Beckenham in March and April; it makes rather small whitish blotches on the upper side of the leaf, and moves from one leaf to another; the pupa is unusually short.

E. albifrontella, I. B., p. 252. I found the larva feeding in the upper part of the leaves of *Holcus mollis* last April.

E. Kilmunella, I. B., p. 253. Bred last July from larvæ found by Mr. Scott in a species of *Carex*, near Fochabers, Banffshire. I am inclined to think that *E. Alpinella*, I. B., p. 254, is only a form of this species.

E. cinereopunctella, I. B., p. 254. The beautiful red-spotted larva mines down the leaves of *Carex glauca* in

spring, having apparently wintered in the withered tip of the leaf; it is full fed in March, and almost immediately it quits the mine it fixes itself in the angle of the leaf, and changes to pupa; thus, by looking at the base of the leaves which have been mined, the pupa may be readily collected. It frequents those plants which grow in the shelter of bushes: those among the junipers at Sanderstead Downs are very prolific in this species.

E. consortella, I. B., p. 256. I have met with this in Headley Lane in July.

E. pulchella, I. B., p. 256, *proves to be* the female of *E. obscurella*, I. B., p. 257. Mr. Edleston's observations, he having taken it, in company with both broods of *obscurella*, show this; and last July I bred both insects from the same larvæ from *Holcus* and other grasses.

E. zonariella, I. B., p. 257. Last August I bred several of this from larvæ in *Aira cæspitosa* sent me by Mr. Scott.

E. gangabella, I. B., p. 258. Bred very freely last summer by Mr. Douglas and myself from larvæ we found in *Dactylis glomerata* near Beckenham. The larvæ commence feeding in the autumn, and make long puckered mines (*Lithocolletiform*) in the grass leaves; they pass the winter without eating, inside the withered leaves, but in March they again make fresh mines, and move readily from leaf to leaf; they are full fed about the middle of April. We found a *few* in *Holcus mollis*. The insect seems very local, as, though so plentiful where we found them, it was only for an extent of about 100 yards; and, though *Dactylis* abounded on both sides of this restricted locality, we found none of this insect.

E. Rhynchosporella, I. B. p. 259. I bred this last June from larvæ found mining down from the tops of the leaves of *Eleocharis*, on Haldon, near Dawlish, last May.

Elachista biatomella, I. B., p. 260. Mr. Wing and I found the larvæ making whitish blotches in the leaves of a *Carex* on the steep side of Box Hill last April. We several times found the pupa placed in the angle of a lower leaf than that which had been mined.

E. triseriatella, I. B., p. 261. No longer unique, a specimen having been taken by Mr. Hogan, at Howth, Ireland, last summer.

E. rufocinerea, I. B., p. 262. In February and March this larva is abundant in the leaves of those plants of *Holcus mollis* which grow under hedges, and on the sides of ditches; it makes broad whitish mines, in which there is very little excrement; it is excessively subject to the attacks of ichneumons.

E. cygnipennella, I. B., p. 262. In the Entomologische Zeitung for 1853, page 415, Zeller describes a species closely allied to this, which he names *E. festucicolella*, having found it in a dry place among *Festuca ovina*, and he mentions that I had informed him it also occurred in England. I alluded to two small specimens taken by Mr. Douglas at Cheltenham, in July, 1853, which I thought distinct from *cygnipennella*, but I am now desirous to suspend my opinion till further observations have been made. When at Dawlish last May I collected an *Elachista* in great numbers, which was evidently attached to the *Festuca duriuscula* growing on the sandy banks; the perfect insect was always sitting on the stems of that grass, and I observed leaves of the grass which had been mined by an *Elachista* larva. I concluded, of course, this would be *E. festucicolella*, and laid in a supply for all my correspondents, but unfortunately have hitherto been quite unable to detect any character by which my specimens can be distinguished from *E. cygnipennella*.

Tischeria complanella, I. B., p. 264. Mr. Wing bred

this last spring from the large white blotches of the oak leaves.

Lithocolletis irradiella, I. B., p. 269. Mr. Wing bred a specimen last spring, from oak leaves collected near Beckenham the preceding autumn. Mr. Shield has also a specimen taken near Dublin "May the 7th, in a mixed hedge."

L. Stettinensis, I. B., p. 279. The larva was observed in great plenty this autumn, in some alders growing in the meadows between Sydenham and Beckenham. The insect is very partial to *the terminal leaf* of each twig, frequently four or five larvæ being in one leaf.

Phyllocnistis suffusella and *saligna*, I. B., p. 285. Mr. Atkinson met with the larvæ of both species near Castle Rising, in Norfolk, early last September.

Nepticula trimaculella, I. B., p. 301. The greenish-grey larva mines in the leaves of several species of poplar (*P. nigra, pyramidalis*, &c.), forming a long gallery. The cocoon is dark brown.

N. ignobilella, I. B., p. 303. The larva forms blotch-formed mines near the edge of the leaf; the excrement is entirely black.

N. Acetosæ, I. B., p. 303. I bred several specimens in August, from larvæ collected by Mr. Shield last July. I also bred a few specimens from larvæ collected by Mr. Wing in the Isle of Wight, early in September. Being, therefore, better acquainted with the species, I give an improved description—

Head *fuscous*, sometimes with a few ochreous hairs. Antennæ dark fuscous, basal joint whitish. Anterior wings *rather dull* bronzy-fuscous, beyond the middle with a dull violent fascia, followed by a rather curved silvery white fascia, which is slightly concave towards the base; the apex of the wing and cilia are dull violet fuscous. Posterior wings pale grey, with pale grey cilia.

Nepticula angulifasciella, I. B., p. 304. The larva here mentioned has now produced this insect; it is, however, extremely difficult to rear.

The insect taken by Mr. Boyd (I. B., p. 306, note) has been described by Boheman as NEPTICULA *quadrimaculella*, from specimens taken in the South of Sweden among nut-bushes.

Answers to ENIGMAS in the ENTOMOLOGIST'S COMPANION.

In the pursuit of scientific truth, intermediate between what we do know, and what we do not know, there is always a certain extent of debateable ground, where the unknown is dimly perceived, or obscurely shadowed forth. That which is thus doubtfully visible speedily becomes clear, if the collective attention of observers be called to the subject; but it is frequently difficult to do this, because, from the very fact of our ignorance, we know not where to record what we thus dimly see, yet, as we must place it somewhere, we run the risk of putting it in the wrong place. For this reason, in my volume of the Insecta Britannica, I abstained from mentioning many larvæ known to me, because the perfect insects, not having been bred, where was I to mention them? In the Entomologist's Companion, however, a work of less pretension, I endeavoured to publish *every scrap of information* I possessed; consequently many larvæ are there recorded of which the perfect insects were then unknown to me. These, to a reader of that book, appear as enigmas; many of these I can now answer, but some yet remain unsolved. The references to the Entomologist's Companion are to the second edition.

E. C., p. 53. "A larva mining the leaves of the dogwood," is that of *Elachista Treitschkiella;* see ante, p. 78.

E. C., p. 59. "A singular polyphagous mining larva, perhaps not LEPIDOPTEROUS," is COLEOPTEROUS, being that of *Ramphus pulicarius.*

E. C., p. 63. "A larva making brown blotches in the leaves of honeysuckle, in July," produced *Perittia obscurepunctella;* see ante, p. 77.

E. C., p. 65. "A larva found last November, in grass, near Beckenham, which mined the grass, not like an *Ela-*

chista, but like a *Lithocolletis*," produced *Elachista yangabella*; see ante, p. 79.

E. C., p. 114. "Larvæ mining the leaves of *Atriplex portulacoides?*" should be referred to *Gelechia instabilella*.

E. C., p. 115. "*Elachista*, larva No. 1." This is the young of the larva of *E. atricomella*.

"*Elachista*, larvæ No. 2." These were the larvæ of *E. rufocinerea*.

E. C., p. 127. "Leaves of *Clematis vitalba* had been mined, either by a Dipterous or a *Nepticula* larva." Mr. Winter found this larva last summer; it is DIPTEROUS.

E. C., p. 132. "A new *Elachista* larva (No. 17, in *Sparganium?*)" The plant should have been named *Poa aquatica*; the larva was that of *E. Poæ*; see ante, p. 69.

E. C., p. 137. "Larvæ of an *Eupithecia?* on yarrow," produced *E. subfulvata*.

"A gallery mine of the sloe, with a green" *Nepticula* "larva." This was the larva of *N. prunetorum*.

"An aspen leaf, in which was a pale *Nep.* larva," produced *N. trimaculella*.

E. C., p. 139. "A *Nep.* larva from *Salix alba*, apparently distinct from that of the sallow," produced, however, only *N. Salicis*.

E. C., p. 140. "A fat whitish larva, below the seeds of *Centaurea nigra*," produced not *Parasia Neuropterella*, but *P. Metzneriella*.

The following ENIGMAS in the ENTOMOLOGIST'S COMPANION still remain unanswered, though it is hoped the solution of them will not be long delayed.

1. E. C., p. 63. "A larva mining, in September and October, the leaves of the *Circæa lutetiana*."

2. E. C., p. 63. "A small mining larva, making dark brown blotches in the leaves of *Origanum vulgare*."

3. E. C., p. 117. "A *Coleophora* larva, feeding on a smooth grass." I found many of this larva on Box Hill last April; they make very conspicuous white mines in the grass. I did not succeed in rearing any, so am not yet certain whether it be *C. Lixella* as suspected.

4. E. C., p. 129. "The clumsy-tailor larva (which takes for its case an entire leaf of hawthorn);" none have yet been reared; the larva was very common on hawthorn last July.

5. E. C., p. 135. "*Nepticula* larvæ, in leaves of *Potentilla fragariastrum*," has again been found, but none have even gone into cocoon.

6. E. C., p. 135. "*Gelechia?* larvæ, folding up the leaves of *Lathyrus pratensis*, and (p. 138) *Vicia Sepium*." None of these were reared.

7. E. C., p. 136. "A *Gelechia?* larva on oak, forming an entire leaf into a *vaulted chamber*." None were reared; one larva lived through the winter.

8. E. C., p. 138. "On apple, a new *Nep.* larva, greenish, with dark-green dorsal line, mining a gallery." None reared, and the larva has again been found rather common in hawthorn leaves; it *may* belong to *N. gratiosella*.

9. E. C., p. 139. "A *Nep.* larva, near the midrib of beech leaves; *basicolella*;" none of these went into pupa; the larva has again been found this autumn.

10. E. C., p. 140. "*Scitelliform* mines on the birch;" a

Nepticula larva, making brown blotches in birch leaves, occurring at Dartford Heath, Mickleham, &c.; none have hitherto been reared.

The following incomplete observations, made during the year 1854, may be considered as so many additional ENIGMAS.

11. An *Elachista* larva, found by Mr. Scott at the end of April, mining in leaves of *Scirpus lacustris*.

12. A *Gelechia* larva, found by Mr. Scott early in May, mining the leaves of *Arctostaphylos Uva-ursi?*

13. A black and white larva, not unlike that of *Gelechia rufescens*, found by Mr. E. Shepherd, near Dartford, last July, by sweeping; unfortunately it soon died, without our discovering on what plant it had fed.

14. A larva found by Mr. Harding, last July, feeding in the stems and roots of *Eryngium maritimum*.

15. A larva found by Mr. Scott, in the berries of the mountain ash; the larva when full fed quits the berry, and forms an open net-work cocoon, within which it forms a close white cocoon.

16. A *Nepticula* larva, found by Mr. Scott, making blotches in the leaves of *Lotus corniculatus*.

17. A *Nepticula* larva, in alder leaves, found near Beckenham by Mr. Douglas and myself, and near Darlington by Mr. Law; the larva resembles that of *N. microtheriella*, the cocoon that of *N. Salicis*.

HYMENOPTERA.

By Frederick Smith.

Notes on the New Species of British Aculeate Hymenoptera.

Since the publication of Mr. Kirby's Monographia Apum Angliæ, fifty-eight new species of Bees have been discovered in this country; several of these have long been known in different parts of Europe, and the descriptions of others lie scattered in various publications. It has been thought desirable to bring together a list of the Bees unknown at the time of publication of Kirby's Work, pointing out the place of their description, the localities known for the species, and adding, at the same time, such observations as appear to be necessary.

In 1836, Shuckard did for the British Fossorial Hymenoptera what Kirby had previously done for the British Bees, and, in his Essay on the Indigenous Fossorial Hymenoptera, described all the British species then known; this Essay enjoys a world-wide fame, and since its publication little has been added to our knowledge of the Fossorial division of the *Aculeata;* yet I have here mentioned the few new species which have occurred, with the view of bringing as it were into one focus, the full amount of united labour on the Aculeate group.

The *Formicidæ* have hitherto been much neglected in this country, and we are only beginning to acquire a knowledge of our riches in number of species. The Stephensian Cata-

logue indicates new genera in this family, and several species enumerated in that list prove not to be British; a revision of the list is therefore highly desirable. The difficulties attending the study of the *Formicidæ* have been removed by the publication of Dr. Nylander's Monograph; the accuracy and acumen exhibited in this work will be acknowledged and appreciated by every lover of the science, who will see, in the lucid elaboration of the species, a master-hand, whose work commands our admiration.

In Stephens's Systematic Catalogue of British Insects many new species are enumerated, which, not having been subsequently described by the author, must have excited much speculation in the minds of Hymenopterists as to which species they may possibly represent; in some genera, the number of new species exceeds the total number at present known. Having the means of clearing up, in a great degree, the difficulties presented by this list, I have added some notes in elucidation of it.

NEW BRITISH BEES DISCOVERED SINCE THE PUBLICATION OF KIRBY'S MONOGRAPHIA.

FAMILY ANDRENIDÆ.

Genus COLLETES.

1. *Colletes marginata*, Smith (Zoologist, iv. 1277). This species is found at Little Hampton, Sussex. I know of no other locality.

Genus PROSOPIS.

2. *Prosopis cornutus*, Smith (Zoologist, vi. 2204). This species was in the collection of Mr. Kirby, but without a name: I discovered the male some years ago at Hawley, Hants; it was described as a distinct species, *P. plantaris*, but having bred the sexes from dock stems, the oldest name is retained.

3. *Prosopis punctulatissimus*, Smith (Zoologist, vi. 2205). This species has not occurred near London; I have more than once taken it in Kent, near Birch Wood.

4. *Prosopis hyalinatus*, Smith (Zoologist, vi. 2206); very abundant in many localities, particularly so at Sandown Bay, Isle of Wight.

5. *Prosopis varipes*, Smith (Catalogue of Hymenopterous Insects, Part i. p. 21, 12). This species is found in Yorkshire, but I know of no other locality.

Genus SPHECODES.

6. *Sphecodes subquadratus*, Smith (Zoologist, iii. 1014); occurs in the London district, and in other localities.

Genus HALICTUS.

7. *Halictus gramineus*, Smith (Zoologist, vii. App. 58).

I took this species at Hawley, Hants; there are specimens in the British Museum from Devonshire.

8. *Halictus longulus*, Smith (Zoologist, vi. 2104); plentiful in the Isle of Wight, and also found in the London district, but rarely.

9. *Halictus interruptus*, Panzer (Smith, Zoologist, vi. 2167). This species is in the collection of British Insects in the British Museum; it is from Devonshire.

10. *Halictus prasinus*, Smith (Zoologist, vi. 2169); taken by Mr. Dale, at Bournemouth, Wales; I took it also in Yorkshire.

11. *Halictus maculatus*, Smith (Zoologist, vi. 2172); Cove Common, Hants; I have not found it elsewhere.

12. *Halictus zonatus*, Smith (Zoologist, vi. 2171); in the London district, near Bristol and also in Scotland.

Genus ANDRENA.

13. *Andrena frontalis*, Smith (Zoologist, vii. App. 59). Having had an opportunity of seeing Kirby's own interleaved copy of the Monographia, I found this insect described under the name of *Bingleyella*: from information which has lately been given to me, I suspect it to be the male of *A. Cetii*.

14. *A. analis*, Panzer (Smith, Zoologist, v. 1920); not uncommon in the north of England, but not hitherto found in the south.

15. *A. eximia*, Smith (Zoologist, v. 1930). This insect may possibly be an extremely highly-coloured variety of *Rosæ*, but the male taken with it also differs from the males of the latter species in having the mandibles toothed; taken at Hastings, and Pembury, Kent.

A. rubricata, Smith (Zoologist, v. 1666). I think this is very probably synonymous with *A. florea*, Fab., St. Fargeau; it occurs near London, and in plenty at Hawley, Hants, in June.

16. *A. decorata*, Smith (Zoologist, v. 1667); found once

near Birch Wood, Kent, both sexes; the male I have seen in other collections.

17. *A. ferox*, Smith (Zoologist, v. 1670). This proves to be the male of *A. distincta;* the sexes were discovered by Mr. Walcott, near Bristol.

18. *A. polita*, Smith (Zoologist, v. 1733); a very distinct species, found at Gravesend in June.

19. *A. vitrea*, Smith (Zoologist, v. 1737); a very distinct species, but I do not know the locality; there are several in Mr. Desvignes' Cabinet.

20. *A. longipes*, Smith (Zoologist, v. 1740); not rare in the neighbourhood of London; particularly near Highgate Archway.

21. *A. æstiva*, Smith (Zoologist, v. 1743); generally distributed, frequently mistaken for *A. Gwynana.*

22. *A. fucata*, Smith (Zoologist, v. 1743). This species is found in the north of England; I have taken it in Yorkshire, and received it from Scotland. It is the *A. clypeata*, of Nylander.

23. *A. conjuncta*, Smith (Zoologist, v. 1744). I took this between Highgate and Colney Hatch some years ago; I have not since met with it.

24. *A. Lapponica*, Zett. On comparison with a specimen from Lapland, I find this identical with *A. apicata* Smith (Zoologist, v. 1748).

25. *A. lacinia*, Smith (Zoologist, v. 1751); the locality not known.

26. *A. Aprilina*, Smith (Zoologist, vi. 2211); in the collection of J. C. Dale, Esq.

27. *A. constricta*, Smith (Zoologist, vii. App. 59). A northern species has occurred at Moffat, Scotland; and near Wakefield, Yorkshire.

28. *A. articulata*, Smith (Zoologist, v. 1750). I consider

this to be only a very large specimen of the male of *A. fulvicrus*.

29. *A. similis*, Smith (Zoologist, vii. App. 60); very like the male of *A. albicans*, but distinct; found by Mr. Walcott near Bristol.

30. *A. extricata*, Smith (Zoologist, vii. App. 59); very like *A. fulvicrus*; Weymouth, and also at Southend.

31. *A. Kirbyi*, Curtis (British Entomology, fol. 129); said to be found near Norwich; the type is in the British Museum. I possess specimens from the Morea.

32. *A. argentata*, Smith (Zoologist, v. 1920); found at Weybridge, Sandhurst, and on Parley Heath by Mr. Dale; Dr. Nylander told me the male was the *A. barbatula* of Zetterstedt.

Genus MACROPIS.

33. *Macropis labiata*, Panzer (Smith, Zoologist, iv. 1279.) Three specimens of the male are all which have hitherto been captured in England; the localities are Leicester, New Forest, and Weybridge. Mr. S. Stevens captured the last in the beginning of July at the latter locality; it no doubt appears about the same time as its congener, *Dasypoda hirtipes*.

Genus MEGACHILE.

34. *Megachile versicolor*, Smith (Zoologist, ii. 697); discovered by Mr. Thwaites, near Bristol. I have taken it at Weybridge, but hitherto it has proved to be very rare; it closely approaches *M. centuncularis*, but the scopa which clothes the abdomen beneath is of two colours, black and fulvous.

35. *M. pyrina*, St. Farg. The male is the *M. rufitarsis*, the female the *M. fasciata* of the Catalogue of British Hymenoptera; it occurs at Weybridge, but rarely.

36. *M. argentata*, Fab. This is identical with *M. Leachella*, of Stephens's Catalogue, which I described in the

Zoologist, ii. 696, as *M. albiventris;* it has been met with at Southend and Weybridge, and at Little Hampton, Sussex.

37. *M. odontura*, Smith (Zoologist, vii. App. 58). I have only seen the unique specimen in the British Museum, taken at Spitchwick, Devon.

Genus Osmia.

38. *Osmia parietina*, Curtis (British Entomology, folio 222). This rare species has been supposed to be identical with the *O. fuciformis*, Latr.; if so, the description of the male will not at all suit the present species; this synonym is therefore very doubtful.

Genus Stelis.

39. *Stelis minuta*, St. Farg. (Smith, Zoologist, iii. 1155); discovered by Mr. Thwaites, near Bristol; I am not aware of it having occurred in any other locality.

40. *S. octomaculata*, Smith (Zoologist, iii. 1155). This little bee was taken at Blackwater, Hants, some years ago; it has not been met with since.

Genus Ammobates.

41. *Ammobates bicolor*, St. Fargeau (Smith, Zoologist, vi. 2212). This bee is in the Museum collection, and is said to have been taken at Leicester.

Genus Nomada.

42. *Nomada lateralis*, Panzer (Smith, Zoologist, ii. 601); found in the London district, plentifully in the neighbourhood of Highgate and Hampstead.

43. *N. baccata*, Smith (Zoologist, ii. 604). This pretty little species was first taken at Sandhurst, and subsequently at Weybridge, in plenty; but it is extremely local.

44. *N. borealis*, Zett. This is the *N. inquilina*, Smith (Zoologist, ii. 605). It is parasitic on *Andrena Clarkella*, and very local and rare: it occurs on Hampstead Heath, and was discovered at Leominster some years ago by Mr. Newman. I have received it from Lapland.

45. *N. signata*, Jurine (Smith, Zoologist, ii. 602); not uncommon some seasons around the Hampstead and Highgate districts.

46. *N. Roberjeotiana*, Panzer (Smith, Zoologist, ii. 603); a very rare species, discovered at Blackwater, Hants; Mr. Dale has also captured it, I believe in Hampshire.

47. *N. rubra*, Smith; described in the Zoologist, vol. vii. App. 41, from the unique specimen in the British Museum, taken at Kingsbridge, Devon, by Dr. Leach.

48. *N. mistura*, Smith (Zoologist, ix. App. 127); taken at Newcastle by Mr. Hewitson; I have since captured a specimen in Yorkshire, and have received it from Scotland.

49. *N. atrata*, Smith (Zoologist, iv. 1568); taken at Arundel by Mr. S. Stevens; it has not occurred elsewhere that I am aware of.

Genus Cœlioxys.

50. *Cœlioxys rufescens*, St. Farg. (Smith, Zoologist, iii. 1152); rare in the London district, but plentiful in Hants, and the Isle of Wight in July.

51. *C. Vectis*, Curtis (British Entomology, folio 349); very plentiful along the Undercliff, Isle of Wight, in July; it has occurred in Hants, and this season at Putney, taken by Mr. Grant.

52. *C. sponsa*, Smith, n. sp. This is probably the male of the next species; both will be described in my work on the British Bees; they were taken in the London district.

53. *C. mandibularis*, Nylander; taken in the same locality as the former.

54. *C. umbrina*, Smith (Zoologist, iii. 1153). This insect occurs in profusion along the Undercliff, Isle of Wight, particularly in Sandown Bay, in July.

Genus Melecta.

55. *Melecta luctuosa*, Scopoli. This is the *true M. punctata*, Fabr., that described in the Monographia being the

M. armata of Panzer; a reference to Panzer's figure shows this to be the case, but it is placed beyond a doubt by Dr. Nylander, who has seen the typical specimen.

Genus CERATINA.

56. *Ceratina albilabris*, Fab. (Smith, Zoologist, vii. App. 57); in the collection of the British Museum, taken in Devonshire by Dr. Leach.

Genus BOMBUS.

57. *Bombus Lapponicus*, Fab. This beautiful species (which I described in the Zoologist, vii. App. 59, as *B. monticola*), was first discovered in Wales, by Mr. Newman; it was next met with on Halifax Moor, Yorkshire, and subsequently in Herefordshire and Monmouthshire, and also in Perthshire, Scotland.

58. *B. Collinus*, Smith (Zoologist, ii. 548); only the male and worker are at present known; the male has occurred at Westow, Yorkshire; near Bristol; on the Brighton Downs, and in Cumberland.

59. *B. Smithianus*, White (Proceedings Linn. Soc. 1851, Ann. and Mag. Nat. Hist. x. New Series, p. 294); the *Bombus arcticus* of Dahlbom, but not of Kirby; this interesting addition to our *Bombi* was made by Mr. A. White, in 1850; he captured it in Shetland; it has not occurred in any other locality.

From the foregoing list, it appears that fifty-nine species of Bees have been added to the British list since 1802; and when we take into consideration that upwards of fifty of the species of the *Monographia* have been united to their partners, thereby reducing the number described as distinct from 221 to 170, it will be seen that a considerable advance has been made in this branch of Entomological science. The present number of species of British Bees will be about the same as Mr. Kirby enumerated, certainly not more than ten

above that number. It is gratifying to see amongst our younger Entomologists several able and industrious students turning their attention to this most interesting order of insects; and although we cannot reasonably expect so large a number to be added to our list of indigenous bees as has been added since Mr. Kirby described them, still many interesting additions are and will be continually made: the remotest parts of the kingdom are by degrees being brought within a day's rail, and we may confidently expect many Swedish and even Lapland species will be added to our Fauna.

The last species in the above list was a grand addition to our Fauna, made by Mr. White, who, had his visit to Shetland been an Entomological one, would no doubt have made other equally interesting additions. On a future occasion we hope to chronicle, not only species, but even genera unknown at present to the British Fauna.

NEW SPECIES OF FOSSORIAL HYMENOPTERA, described or discovered since the publication of SHUCKARD'S ESSAY.

Genus POMPILUS, Fab.

1. *Pompilus acuminatus*, Smith. This species is described in the Catalogue of British Hymenoptera, App. 119. I received it from Moffat, Scotland; there is a specimen in the British Museum, without a locality.

Genus APORUS, Spin.

2. *Aporus bicolor*, Spinola. I captured two specimens of this insect at Southend; that described in Shuckard's Essay is only a variety of *P. pectinipes*, having the second transverse cubital nervure obsolete.

Genus ASTATA, Panzer.

3. *Astata stigma*, Panzer. I captured a female of this

species at Weybridge, in 1845, and described it in the Zoologist, vol. iv. 1157, as *A. jaculata*. I supposed it to be a new species; but on obtaining the sexes of *A. stigma* from France, I find it to be the female of that species; the male has not been met with in England.

Genus TRYPOXYLON, Latr.

4. *Trypoxylon attenuatum*, Smith; described in the Catalogue of British Hymenoptera, App. 120. I received the species from Bristol, where it appears to be abundant.

Genus CERATOPHORUS, Shuckard.

5. *Ceratophorus anthracinus*, Smith; described in the Zoologist, vol. ix. App. 126; this species I received from Devonshire.

Genus CRABRO, Fab.

Crabro interstinctus, Smith; described in the same page as the former; the locality is Weybridge.

Genus VESPA, Linn.

6. *Vespa arborea*, Smith (Zoologist, vii. App. 60). I discovered this species in Yorkshire in 1836. It appears to be a northern insect; it has been taken in Cumberland and Scotland. M. Saussure has met with it near Geneva.

NOTES ON THE MYRMICIDÆ AND FORMICIDÆ.

Family MYRMICIDÆ (*Formica*, pt. Linn.)

1. *Myrmica scabrinodes*, Nylander; very abundant in all parts of England.

2. *M. ruginodis*, Nylander; equally abundant with the former species; this species I believe to be identical with the *M. rubra* of our lists.

3. *M. lævinodis*, Nylander; not so abundant as the preceding; found at Shanklin, Isle of Wight; Weybridge, &c.

4. *M. cæspitum*, Latr.; this name appears in the Sys-

tematic Catalogue, but the insect does not exist in the Stephensian Collection; there it is represented by *M. scabrinodes*, male. This species, which is the *M. fuscula* of Nylander, is very abundant on our coasts; it abounds along the Undercliff, Isle of Wight, and many large colonies exist on the shore below Southend; it is also abundant at Folkstone, &c.

5. *M. simillima*, Smith; this insect was sent to me by Mr. Dale some years ago, captured in Dorsetshire.

Family FORMICIDÆ.

6. *Tapinomia collina*, Förster (Hym. Stud. Form. p. 43, 21). This species was captured by Mr. Dale, at ———. It is a form new to our Fauna—being characterized by having the scale decumbent, the base of the abdomen being produced and overhanging the abdominal scale and peduncle; this is the most obvious point of difference from *Formica*.

NOTES in explanation of the NEW SPECIES OF ACULEATE HYMENOPTERA in STEPHENS'S SYSTEMATIC CATALOGUE.

no.

4865. *Pompilus nervosus*, Steph., the ♀ of *P. gibbus*, Linn.
4866. *P. cognatus*, Steph., the ♀ of *P. pectinipes*, Linn.
4867. *P. basalis*, the ♂ of *P. gibbus*, Linn.
4868. *P. phæopterus*, Steph., the ♀ of *P. affinis*, Van der Lind.
4869. *P. apicalis*, Steph., the ♂ of *P. niger*, Fab.
4870. *P. aterrima*, Steph., the ♀ of *P. niger* (major), Fab.
4873. *P. argyrostoma*, Steph., the ♂ of *P. plumbeus*, Fab.
4875. *P. nigerrimus*, Steph., the ♀ of *P. petiolatus*, Van der Lind.
4877. *P. subfasciatus*, Steph., the ♀ of *P. hyalinatus*, Fab.
4879. *P. nebulosus*, Steph., the ♀ of *P. exaltatus*, Fab.
4880. *P. zonatus*, Steph., the ♂ of *P. exaltatus* (minor), Fab.
4881. *P. subnebulosus*, Steph., variety of the ♂ of *P. exaltatus*, Fab.
4884. *P. formosus*, Steph., the ♂ of *P. notatus*, Rossi.

No.

4885. *P. notatus*, Steph., the ♀ of *P. cinctellus*, Spin.

4888. *Ceropales calcaratus*, Steph., the ♂ of *P. hyalinatus*, Fab.

4889. *C. punctum*, Steph., the ♂ of *P. petiolatus*, Van der Lind.

4891. *C. nigripes*, Steph., a variety of *C. maculata*, Fab.

4892. *C. rufipes*, Steph., a variety of *C. maculata*, Fab.

4901. *Amnophila pulvillata*, Sowerby, the ♂ of *A. sabulosa*, Linn.

4908. *Pseu aterrimus*, Steph., the ♀ of *P. atratus*, Panz.

4909. *P. caliginosus*, Steph., the ♀ of *P. atratus*, Panz.

4902. *P. compressicornis*, Steph., the ♂ of *P. atratus*, Panz.

4917. *Arpactus consobrinus*, Steph., the ♂ of *A. tumidus*, Panz.

4911*. *Gorytes quinquefasciatus*, Steph., the ♀ of *G. Fargeii*, Panz.

4912*. *G. quinquecinctus*, Steph., the ♀ of *G. Fargeii*, Panz.

4916*. *Lyrops tricolor*, Steph., the ♂ of *Larra pompiliformis*, Panz.

4917*. *L. bicolor*, Steph., the ♀ of *L. pompiliformis*, Panz.

4926. *Oxybelus trideus*, Steph., the ♀ of *O. uniglumis*, Linn.

4927. *O. bispinosus*, Fab., the ♂ of *O. uniglumis*, Linn.

4931. *Crabro pterotus*, Steph., the ♂ of *C. patellatus*, Panz.

4933. *C. interruptus*, Steph., the ♀ of *C. cribrarius*, Linn.

4934. *C. palmatus*, Steph., the ♂ of *C. cribrarius*, Linn.

4937. *C. subinterruptus*, Steph., the ♀ of *C. Lindenius*, Shuck.

4940. *C. agrestis*, Steph., the ♀ of *C. vagus*, Fab.

4941. *C. dirisus*, Steph., the ♂ of *C. vagus*, Fab.

4942. *C. vespiformis*, Steph., the ♂ of *C. Lindenius*, Shuck.

4944. *C. scripes*, Steph., the ♀ of *C. vagus*, Fab.

4945. *C. subterraneus*, Steph., the ♀ of *C. xylurgus*, Shuck.

4949. *C. duodecimguttatus*, Steph., the ♂ of *C. xylurgus*, Shuck.

4951. *C. tarsalis*, Steph., the ♀ of *C. leucostoma*, Linn.

4952. *C. signatus*, Steph., the ♀ of *C. dimidiatus*, Fab.

4953. *C. analis*, Steph., the ♂ of *C. subpunctatus*, Rossi.

4954. *C. consobrinus*, Steph., variety of the ♂ of *C. subpunctatus*, Rossi.

4955. *C. quadrimaculatus*, Fab., a variety of the ♂ of *C. subpunctatus*, Rossi.

4957. *C. aterrimus*, Steph., the ♀ of *C. leucostoma*, Linn.

4959. *C. spiniceps*, Steph., the ♂ of *C. leucostoma*, Linn.

4960. *C. geniculatus*, Steph., the ♀ of *C. scutellatus*.

4962. *C. stigma*, Steph., the ♀ of *C. elongatulus*, Van der Lind.

4963. *C. tibialis*, Steph., the ♂ of *C. podagricus*, Van der Lind.

4964. *C. scutellatus*, Steph., the ♂ of *C. spinipectus*, Shuck.

No

4965. *Crabro phœopterus*, Steph., the ♀ of *C. scutellatus*.

4967. *C. dimidiatus*, Steph., the ♀ of *Diodontis tristis*, Van der Lind.

4978. *Pemphredon nitida*, Steph., the ♂ of *P. lugubris*, Fab.

4981. *P. fuscipennis*, Steph., the ♀ of *P. lugubris*, Fab.

4983. *P. hyalipennis*, Steph., the *Cemonus lethifer*, Shuck.

4987. *Mellinus bifasciatus*, Steph., the ♂ of *M. arvensis*, Fab.

4988. *M. interruptus*, Steph., a variety of the ♀ of *M. arvensis*, Fab.

4990. *M. pratensis*, Steph., a variety of the ♀ of *M. arvensis*, Fab.

4991. *Cerceris aurita*, Steph., the ♀ of *C. arenaria* (major), Linn.

4992. *C. læta*, Steph., the ♀ of *C. arenaria* (major), Linn.

4994. *C. quinquecincta*, Steph., the ♀ of *C. interrupta*, Panz.

4996. *C. arenicola*, Steph., the ♂ of *C. arenaria*, Linn.

5002. *C. ferox*, Steph., the ♀ of *C. ornata* (major), Fab.

5007. *Odynerus Eumenoides*, Steph., the *O. murarius*, Linn.

5026. *O. triangulus*, Steph., the ♂ of *O. parietina*, Linn.

NOTES

ON

THE COLLECTING AND PRESERVING

OF

COLEOPTERA.

By T. Vernon Wollaston, M.A., F.L.S.

To offer suggestions, to the incipient Coleopterist, of such a general and practical character as shall enable him, whilst in pursuit of his objects, to realize as far as may be possible the old saying (albeit applied to a different subject) of

Delectant domi, *non impediunt foris ;*

or to point out the various localities to which his attention should be turned, and in which his labours are the most certain to be crowned with success, is no easy task; and yet, without some tolerably definite instructions on these heads, much time and many valuable opportunities are apt to be lost. To attempt to indicate, however, the *locus quo* of the numerous families which compose the Coleopterous world would, in a limited space, be absurd, seeing that almost every spot, and combination of circumstances, has its own tale to tell. The collector, indeed, who would turn his researches to the best account, must be on the *qui vive* everywhere. Nevertheless, there are unquestionably certain places and conditions which experience has shown to be *par excellence* adapted to his purpose, and of these we will now speak.

Sandy districts, especially towards the coast, are at all times preferable to clayey ones; but the *intermediate* soils, as for instance the deep black loam of the alluvial countries and of the fens, are perhaps the most productive—and where *woods* can be found in such tracts, the Coleopterist has attained his Paradise. The higher the position above the sea, the later (as a general rule) will be the season for collecting in it; and hence the lower regions (particularly the shore) should be selected in the early spring, whilst the mountains and moorlands are reserved for the autumn. In maritime tracts, where a very large proportion of our rarer species occur, the sweeping-net will be of *comparatively* little use, the insects in such situations being best obtained either from beneath pebbles and rejectamenta in open grassy spots, or else harbouring around the roots and stems of plants amongst sand. In Alpine countries, again, the net may be almost dispensed with, there being seldom vegetation enough in such districts to admit of its action; whilst the species which obtain are for the most part (even more peculiarly so than the littoral ones) attached to the undersides of stones.

It is a mistake to suppose that the progress of agriculture tends to lay waste our Entomological preserves, and to exterminate insect life. In some few instances (as in the destruction of forests) this may be, and probably is, the case; but I am convinced that, in a general way, the very reverse is nearer the truth. The vast superiority of the London district (highly cultivated as it is) over almost every other in England, may be quoted in support of this; and I may add, from personal observation, that I have never met with such marked success as along railway embankments, and on other grounds recently turned-up by the edges of gardens and fields, where the vegetation is rank and redundant. Let not the collector assume, therefore, that he must needs sally to a distance for his game, since he will often reap a richer har-

vest a hundred yards from his own door than by taking a "return ticket" (which involves, moreover, the loss of time) for a hundred miles into the country—perchance into some cold clayey region where his exertions will prove comparatively fruitless.

Let the moss be carefully examined (for the minuter tribes), wherever it can be procured, though more especially from off the trunks of trees. The best plan in the winter months is to shake it over a large bag, the contents of which may be gradually turned out, on a sheet of white paper, at home; and if overhauled in front of a window, nothing will be lost, as those species which escape will almost invariably fly or run to the light, and may be immediately secured from off the glass.

The fungi in woods, and agarics from off the trunks of trees, must never be neglected, as they occasionally teem with life—though more often of the smaller than the larger kind—and where they are observed to be full of a species which is usually rare, it is better to bring away a portion of the substance itself, and leave the remainder for another day, than to *destroy the whole* by endeavouring to procure *in situ* all the specimens which it contains.

Dead animals, partially-dried bones, as well as the skins of moles and other vermin which are ordinarily hung up in fields, are magnificent traps for *Coleoptera;* and if any of these be placed around orchards and enclosures near at home, and be examined every morning, various species of *Nitidulæ*, *Silphidæ*, and other insects of similar habits, are certain to be enticed and captured.

Planks and chippings of wood may be likewise employed as successful agents in alluring a vast number of species which might otherwise escape our notice, and if these be laid down in grassy places, and carefully inverted every now and then with as little violence as possible, many insects will be found adher-

ing beneath them, especially after dewy nights and in showery weather. Nor must we omit to urge the importance of examining the undersides of stones in the vicinity of ants' nests (though particularly those of the *Formica flava* and *fusca*, in chalky districts), in which positions, during the spring and summer months, many of the rarest of our native *Coleoptera* may be occasionally procured.

The muddy banks of rivers, and the alluvial deposits of marshy grounds, are pre-eminently rich, and must be carefully searched. On warm still days, when the sun is bright, such spots are often alive with the *Bembidiades* and *Staphylinidæ*, which may be brought in still greater numbers to the surface by *treading down* the earth amongst the rushes and coarse grass with which such localities abound; whilst in fenny districts the heaps of sedge which, after being cut, are permitted frequently to remain in such situations, will never fail to afford beneath them a *bonne bouche* for the Coleopterist.

Felled timber (particularly in the woodland countries) should never be overlooked, a host of species occurring beneath bark (especially when in a rotting state) which we shall in vain search for elsewhere; and where wounds in trees (uncut) have caused the sap to exude, and the bark to have become loosened from disease, a passing investigation will seldom fail to reap its reward.

The waters, moreover (both stagnant and running), teem, especially during the autumnal months, with life, from the edges of the mighty river rolling in its pride, to the mere footprints of cattle stamped on the undrained soil. Mountain rills, however, small limestone pools, and deep ditches (in fenny and brackish spots), will best repay examination; whilst the stones and pebbles which are more or less immersed along the margins of streams and lakes present the most promising conditions for the *Philhydrida*.

As for those spots in which the art of *brushing* comes into play but little need be said, the sweeping-net being almost universal in its operation, and consequently attaining its maximum of usefulness wherever vegetation is the most rampant; and this brings us to the second portion of our subject, namely, the consideration of

The *Instrumenta belli* of the Coleopterist.

A sweeping-net is the first thing to be obtained. They are well known to all collectors, and those manufactured by Mr. Downie (usually to be purchased in London) are the best. Not less than two wide-mouthed bottles (with a quill through each cork, and some blotting-paper within for the insects to adhere to) must be taken, in addition to a few tin boxes (or tubes) for the reception of the larger species, and to hold (if required) portions of fungi or larvæ. If it be thought desirable, a laurel leaf may be cut into each bottle, which will kill the inmates in a short time, and *at once* so stupify them as to prevent the possibility of civil war, *inter se*; whilst it will preserve them in a sufficiently relaxed state to be afterwards set out. This, however, should not be entirely trusted to as a means of destruction, and it will be advisable to dip each bottle for a few minutes into boiling water after returning home; for the insects which have been captured late in the day, and which happen to be tenacious of life, will be often so far overpowered as to appear dead; but after being expanded, on this hypothesis, they will be found in a fortnight's time waving their antennæ to and fro over the cards to which they have been carefully and tightly gummed down.

A few quills, closed with small corks, may be put into the waistcoat pocket; for, whilst by no means necessary, it may be sometimes satisfactory to keep captures of an extremely rare nature (should the collector be fortunate enough to meet

with them) apart from the rest; but all "stifling-boxes" (as they are termed by their cockney inventors, and within which *Coleoptera* will live the term of their natural lives) and other such absurdities, although they may serve to amuse children, are worse than useless.

Next, as regards

The *Modus operandi* in mounting *Coleoptera*.

Much might be said—this being perhaps the most important item for our consideration, and one on which the value of our collections in a scientific point of view, apart from their symmetry of arrangement (which has a charm essentially its own), almost exclusively depends.

Imprimis, then, let the collector provide himself with a strong box, about the size of a dressing-case (small enough to be taken charge of *personally* whilst on his travels, and which must not be allowed ever to be treated *as baggage*): a leather cover to strap over it will be found desirable, and will render it easy of carriage when on the move. Let this box contain a gigantic wide-mouthed bottle (to be nearly filled with laurel leaves, cut up and bruised); a smaller one for spirits of wine (which may sometimes be required for the large and dark species, though it is generally better to avoid this mode of preserving them when setting boards are to be had); another, of the same size, for gum (composed of three parts of Tragacanth to one of Arabic, both in powder; to be mixed in water containing a grain of Corrosive Sublimate, without which it will not keep, until of a consistency just thick* enough to run); a small, partitioned box, to hold pins

* It may be well to state that this gum is of an extremely absorbent nature, and that nearly a fortnight is usually required before it can be properly made. The best plan is, to keep adding a little water (and stirring it) every few days until it is of the proper consistency, which should be so thick that the bottle may be almost inverted without its

(two sizes will generally suffice—the larger one for the species which are to be stuck, the smaller for piercing through the cards); scissors, camel's-hair brushes, and a pair of pliers; and, lastly, a drawer fitted up with a dozen or more thin frames of wood—which are packed one over the other; and on to each of which is glued a sheet of cardboard (of similar size), for the insects to be gummed upon *promiscuously*.

It is the best plan to mount *Coleoptera* generally *upon cards*—at any rate all species smaller than (for instance) a *Harpalus;* since in this manner they are not only preserved for a far greater length of time than by the ordinary method (and are, moreover, much less subjected to breakages), but we avoid the corrosion which is so apt to take place upon the pin, and which is liable to accumulate to such an extent as, at last, to destroy the specimen *in toto*. Admitting therefore the advantage of this principle, both in theory and practice, let us make another observation. Those Entomologists who have commenced to adopt this "card-system" (as it may be termed) have usually fallen into error by cutting their cards *first* (no doubt for the sake of symmetry), and then forcing their insects as it were to *fit* them. Now this is obviously a mistake. Uniformity, it is true, is most desirable in a well-arranged collection; but it is certainly not *so* important as that the specimens should be all properly expanded (legs and antennæ to their natural length),—without either drawing them out, or contracting them in (as the case may be) beyond what is right, to suit the respective spaces which we have beforehand allotted to them. It is clearly more consistent *to adapt the card to the insect, than the insect to the card*: and, such being the case, the above-mentioned

running out. A single grain, however, of Corrosive Sublimate is sufficient for a very large quantity; and it is advisable to dissolve this grain in the water which is poured *first* upon the gum.

"frames" (from off which the specimens may be cut at leisure; and at times, as for instance the winter, when we are comparatively unoccupied) are at once applicable,—whilst they enable us to stow into a single, compact drawer upwards of two thousand individuals at least, which, according to the usual plan, would have occupied two or three cumbersome store-boxes for their reception.

The *mode* of setting *Coleoptera* may be briefly described as follows. The insects having been taken out of their bottle, when killed, if you have not time to expand them *whilst fresh*, put them into a minute bag (silk is the best), to be thrown amongst your bruised laurel leaves. They will keep pliant for a long time there, though it is *desirable* not to let them remain in it much beyond a week. When you have leisure to mount a few of them, take a certain number out from the bag; and, having gummed thickly a space on your cardboard equal to, at least, *the entire specimen when expanded*, place the beetle upon it, drag out the limbs with a pin, and, leaving it to dry, go on with the next one that presents itself. As the card has to be cut, afterwards, *around* your insect (so as to suit it), there is no advantage in gumming it precisely *straight upon your frame*,—though it is true that a certain amount of care in this respect lessens your after-labour, of cutting-off, very materially.

When your frame has been filled, and you are desirous of separating the species, cut off the entire cardboard (immediately within the frame) with a penknife, and perform the remainder of your work with finely-pointed scissors. Although at first this process may seem to be tedious, a little practice will soon make perfect; whilst the advantages of the system are so obvious, that, when once adopted, it will assuredly never be relinquished. For several years past I have tested it most rigidly (not only in this country but on the continent also), and have attempted no other mode; and

I am ready to submit the result, as evinced by the state of my collection, to the consideration of anybody who will take the trouble of inspecting it.

Such are a few general hints on the collecting and preserving of *Coleoptera*, compiled exclusively for the use of the beginner. Had space been unlimited, they might have been multiplied tenfold: but it is hoped that even these, such as they are, will not be found altogether worthless.

T. V. Wollaston.

25, Thurloe Square, Brompton,
March 9th, 1855.

COLEOPTERA.

BY E. W. JANSON.

In order to obtain a clear starting-point, it has been necessary to notice here all the New British Beetles recorded since the last standard work on the subject; and the number of species being so great, and the space accorded to me so limited, these notices have necessarily been as brief as possible.

At the close however of another season, I hope that the space will allow of my giving *detailed* notices of all the new species occurring in 1855, with descriptions, if possible, so as to make this portion of the work more interesting to the young student.

Taking Mr. Stephens's Manual of British Beetles, published in 1839, and which, however great its imperfections, is the most complete descriptive catalogue of the order which we possess, as my starting-point, I have endeavoured to collect and arrange the species, which have been since given as indigenous to Great Britain.

To this end I carefully scanned the pages of the Entomologist and of the Zoologist, and extracted from the numerous lists and notices of captures all the specific *names* unenumerated by Mr. Stephens. This accomplished, I sought to divide the formidable array of names thus obtained into two distinct categories: firstly, those which represented *species* not contained in the Manual, and secondly, those which were

new *names* only, old friends in novel attire. But here was the rub; and I must frankly admit that had not two kind friends opportunely stepped in at this juncture to my assistance, I should have abandoned my project in despair; for, in the greater number of these lists the contributors had entirely omitted to append an author's name to the specific titles. How far I ultimately succeeded in this division, admitting the first and rejecting the second, I leave my readers, and more especially the authors of the notices aforesaid, to decide. Another difficulty I encountered, chiefly among the *Curculionidæ*, was the occurrence of names registered during the transitional state of the nomenclature, in genera not yet revised, or rather the revision of which has not yet been published, by Mr. Walton, and concerning which I should inevitably have committed several ridiculous blunders had not the cabinets of Messrs. Stevens and Wollaston set me aright. And here I would earnestly appeal to the gentleman, to whom, for the last fifteen years, all engaged in the acquisition and study of British *Coleoptera* have, I believe without exception, hastened to communicate the rarities or novelties with which industry and perseverance, and on which success is invariably the attendant, has rewarded them,—to whom all have silently but anxiously looked for the accomplishment of the promise given nearly twelve years since,* but which, up to the present time, has been so sparingly and intermittently carried out: not that I would utter a single word in depreciation of leisurely investigation, of which there is unfortunately palpably too great a lack in many of the entomological essays of the present day, and in which the characteristic of this precipitate go-ahead age is a predominant feature; but, considering that the eighth of

* Annals and Magazine of Natural History, vol. xiii. p. 81. February, 1844.

a century has well nigh elapsed since the announcement that the nomenclature of nearly all the British species was cleared up, I think that this appeal can scarcely be styled unreasonable, particularly when it is borne in mind, that the consciousness that one was engaged on the subject whose high qualifications have been incontestably proved, whose materials are unequalled in extent, and whose opportunities of arriving at correct results are and must remain unparalleled, has deterred others from paying that attention to the group which they might otherwise have done,—that the collection of the illustrious Schönherr, now gathered to his fathers, having, I believe, become public or rather government property, will never again contribute the types and information which its late possessor, doubtless satisfied that they would be applied to the general weal, the advancement of science, and the elimination and dissemination of truth, lavished on the English reformer,—that the enlightened and amiable Germar, who likewise lent his hearty co-operation, has also passed away, although, happily for our science, his collection has descended to one, who, among the first to point out and rectify the errors of the nomenclature adopted in this country, has ever extended a helping hand to those engaged in perfecting the good work he so ably and impartially commenced, and from whose unbiassed and truth-loving pen the painstaking and conscientious labourer in the entomological vineyard may with confidence look forward to the encouraging word of praise, and the indolent and unscrupulous scribbler as surely await well-merited rebuke, in the invaluable yearly reports instituted by the late Dr. Erichson. I sincerely trust that this appeal will not have been made in vain, that the precious MSS. will be withdrawn from their resting-place, that they will not tarry on the way to Red Lion Court, and that when the bright sun of the yet distant though approaching Spring again calls us from our books and boxes, we

may be enabled to resume our nets with the consciousness that the rows of weevils now standing in our drawers in dismal array unnamed, and with labels reversed, or ("awaiting Walton's Catalogue") consigned to the repository reproachfully yet hopefully endorsed "*Insecta non-determinata*," have at length been definitively arranged, and, wandering perchance with plying arm and watchful eye in search of some rare *Curculio* through the shady copse, green mead, or fragrant heath, chronicled, perhaps oft traversed, by Britain's Schönherr, his name and the debt we owe him shall not be forgotten even in the collector's ruling passion—*amor habendi*.

The "Annals and Magazine of Natural History," of which the thirty-fourth volume is within a number of completion, was the next object of research; the entomological papers, I allude to those on *Coleoptera*, contained in this important periodical, although numerically comparatively insignificant, are of the highest order, and, with one exception, the selection of the species appertaining to my list occasioned me no difficulty.

Mr. Andrew Murray's "Catalogue of Scottish Coleoptera," William Blackwood & Sons, Edinburgh and London, 1853, next demanded my attention, and to this meritorious little book our list, as will be seen, is greatly indebted.

The "Catalogue of the Coleoptera of Northumberland and Durham," by Messrs. Hardy and Bold, published in the "Transactions of the Tyneside Naturalists' Field Club," and also in a separate form, has contributed no insignificant number of new species, particularly among the *Brachelytra;* and, although assuming the modest title of Catalogue, is replete with valuable observations, and the descriptions of new species leave nothing to be desired.

"The Proceedings of the Berwickshire Naturalists' Club" has likewise contributed to my undertaking.

To Mr. Hogan's "Catalogue of Coleoptera found in the neighbourhood of Dublin," published in the Zoologist, I must also acknowledge myself indebted for many novelties.

Mr. Wollaston's "Insecta Maderensia" has also afforded its quota, and I may, perhaps, here be permitted to observe that at least three-fourths of the genera of *Coleoptera* comprised in Mr. Wollaston's work, and to which order the present volume is restricted, are indigenous to Great Britain; that their characters have all been re-wrought from actual re-investigation, and that the student of British *Coleoptera* will, in the pages of this magnificent book, find ample and satisfactory details of upwards of one hundred and fifty genera of British Beetles.

In the "Transactions of the Entomological Society of London," of which the second part of the eighth volume has just made its appearance, and which embrace a period of no less than twenty years, only three papers have furnished matter for the present list.

Nearly two hundred and thirty species, none of which, it is presumed, are given in Mr. Stephens's "Manual of British Beetles," are comprised in this list; if to these we add those extant in our cabinets, but which have not been recorded, and which certainly do not fall far short of a hundred, it results that three hundred and thirty species have been discovered during the last fifteen years, or at the rate of twenty-two per annum, and, judging from the lists of the Coleopterous productions of countries occupying a geographical position very similar to our own, there exists ample room for at least a corresponding increase during the succeeding fifteen years.

I will conclude by remarking that the brief period allotted me for the completion of my task, and which has been accomplished during the short and uncertain intervals afforded by more urgent occupations, has precluded me from referring

to several works which would probably have augmented the list; but I trust that success will attend this little Annual, and that I may have an opportunity, in its successor, of supplying the omissions and correcting the errors of the present.

EDWARD W. JANSON.

FORTIS GREEN, NEAR FINCHLEY,
MIDDLESEX.

Nov. 20th, 1854.

NEW BRITISH COLEOPTERA SINCE 1839.

1. Dyschirius obscurus, Gyll.; Dawson, Geodeph. Brit., p. 29 (1854), *described.*

2. Dyschirius impunctipennis, Dawson, Geodeph. Brit., p. 29, tab. i. fig. a. (1854), *described.*

3. Dyschirius jejunus, Dawson, Geodeph. Brit., p. 31, tab. i. fig. b. (1854), *described.*

4. Calathus nubigena, Haliday, Ann. Nat. His., ii. p. 112 (1838), *described;* Dawson, Geodeph. Brit., p. 79, tab. i. fig. d. (1854), *described.*

5. Anchomenus (Agonum) atratus, Dufts; Dawson, Geodeph. Brit., p. 89 (1854), *described.*

6. Anchomenus (Agonum) quadripunctatus, De Geer, Eric. not Steph.; Dawson, Geodeph. Brit., p. 95, tab. i. fig. e. (1854), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 6 (1848), and Appendix, p. 229 (1852).

7. Amara curta, Dej.; Dawson, Geodeph. Brit., p. 121 (1854), *described.*

8. Amara (Celia) ingenua, Dufts., Gyll., Eric., not Steph.; Dawson, Geodeph. Brit., p. 125 (1854), *described.*

9. Amara septentrionalis, Curtis, Ann. Nat. Hist. v., p. 275 (1840), *described.*

Observation.—I find no mention made either of this or the three following in Mr. Dawson's work. It is, however, incumbent on me to include them in the present list; the late Dr. Erichson, in his Entomological Report for the year 1841, p. 19 (Archiv für Naturgeschichte, 1842, ii. p. 207), remarks "that they

are characterised in such a way as not to permit a decision in their favour."

10. AMARA AGILIS, Rylands, Entom., p. 216 (1841), *described.*

11. AMARA PUNCTICOLLIS, Rylands, Entom., p. 216 (1841), *described.*

12. AMARA DALII, Rylands, Entom., p. 216 (1841), *described.*

13. TANYSTOMA JAGŒRI, Mann.

Observation.—This is the "new British genus of Carabideous *Coleoptera* allied to *Pterostichus*, captured by Mr. Leplastrier near Dover," exhibited by Mr. S. Stevens at the Meeting of the Entomological Society of 1st June, 1840, as recorded in the Proceedings of the Society. Mr. Stevens, in whose cabinet it is preserved, has kindly furnished its name, remarking "that it is in all probability an imported specimen, being a scarce Russian insect."

14. HARPALUS (Ophonus) CORDATUS, Dufts, Sturm; Dawson, Geodeph. Brit., p. 136 (1854), *described.*

15. HARPALUS (Ophonus) RUPICOLA, Sturm; Dawson, Geodeph. Brit., p. 136 (1854), *described.*

16. HARPALUS SULPHURIPES, Germar; Dawson, Geodeph. Brit., p. 141 (1854), *described.*

17. HARPALUS WOLLASTONI, Dawson, Geodeph. Brit. p. 144 (1854), *described.*

Observation.—Mr. Wollaston informs me that he suspects this will prove synonymous with *Harpalus litigiosus*, Dej. Spec. Gen. des Coléop., vol. iv. no. 137, p. 361 (1829).

18. HARPALUS MELANCHOLICUS, Dej., Eric.; Dawson, Geodeph. Brit., p. 150, tab. ii. fig. A. (1854), *described.*

19. STENOLOPHUS ELEGANS, Dej.; Dawson, Geodeph. Brit., p. 156, tab. ii. fig. B. (1854), *described.*

20. STENOLOPHUS DERELICTUS, Dawson, Geodeph. Brit., p. 159 (1854), *described.*

21. STENOLOPHUS FLAVICOLLIS, Sturm, not Steph.; Dawson, Geodeph. Brit., p. 160 (1854), *described;* Zool. p. 2112 (1848).

22. STENOLOPHUS EXIGUUS, Dej., Eric.; Dawson, Geodeph. Brit., p. 161 (1854), *described.*

23. BRADYCELLUS COGNATUS, Gyll., Dej., not Steph.; Dawson, Geodeph. Brit., p. 163 (1854), *described.*

24. TRECHUS INCILIS, Dawson, Ann. and Mag. Nat. Hist., 2nd ser., vol. iii. p. 213 (1849), *described;* Geodeph. Brit., p. 168, tab. ii. fig. D., tab. iii. fig. 3 (1854), *described.*

25. AEPUS ROBINII, Laboulb.; T. V. Wollaston, Zool., p. 3090 (1850); Murray, Cat. Scot. Col., p. 11 (1853); Dawson, Geodeph. Brit., p. 171 (1854), *described* "*Aëpys.*"

26. BEMBIDIUM (Peryphus) BRUXELLENSE, Wesmael; Rev. H. Clark, Zool., p. 3705 (1852); Hardy and Bold, Cat. Col. Northumberland and Durham, App. p. 236 (1852); Murray, Cat. Scot. Col., p. 13 (1853); A. R. Hogan, Zool., p. 4136 (1853); Dawson, Geodeph. Brit., p. 182 (1854), *described.*

27. BEMBIDIUM (Peryphus) FLUVIATILE, Dej.; Dawson, Geodeph. Brit., p. 184 (1854), *described.*

28. BEMBIDIUM (Peryphus) TESTACEUM, Dufts; Dawson, Geodeph. Brit., p. 186 (1854), *described;* Ann. and Mag. Nat. Hist., 2nd ser., vol. iii. p. 214 (1849), *described* '*Peryphus neglectus;*" Hardy and Bold, Cat. Col. Northumberland and Durham, App., p. 236 (1852), "*Bembidium tricolor*, F."

29. BEMBIDIUM (Peryphus) STOMOIDES, Dej.; Dawson, Geodeph. Brit., p. 188, tab. iii. fig. A. (1854), *described.*

30. BEMBIDIUM (Notaphus) OBLIQUUM, Sturm, Dej., Eric., not Steph.; Dawson, Geodeph. Brit., p. 195, tab. ii. fig. E. (1854), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, App. p. 237 (1852).

31. BEMBIDIUM (Notaphus) CLARKII, Dawson, Ann. and Mag. Nat. Hist., 2nd ser., vol. iii. 215 (1849), "*Lopha*;" Geodeph. Brit., p. 199, tab. iii. fig. E. (1854), *described*; T. V. Wollaston, Zool., p. 3617 (1852).

32. BEMBIDIUM (Leja) SCHUPPELII, Dej.; Dawson, Geodeph. Brit., p. 201, tab. iii. fig. D. (1854), *described*; T. J. Bold, Zool., p. 3289 (1851), p. 4195 (1854); Murray, Cat. Scot. Col., p. 14 (1853).

33. BEMBIDIUM (Lopha) DORIS, Panz., Gyll., Sturm, Eric., not Steph.; Dawson, Geodeph. Brit., p. 203 (1854), *described*.

34. BEMBIDIUM (Lopha) CALLOSUM, Küster; Dawson, Geodeph. Brit., p. 206, tab. iii. fig. C. (1854), *described*.

35. HALIPLUS FLUVIATILIS, Aubé, Schaum, Zool., p. 1889, (1847).

36. HYDROPORUS TRISTIS, Payk., not Steph., Schaum, Zool., p. 1892 (1847); T. J. Bold, Zool., p. 4193 (1854).

37. HYDROPORUS OBSCURUS, Sturm (*Hydrop. umbrosus*, Steph.?); Schaum, Zool., p. 1892 (1847).

38. HYDROPORUS MINUTISSIMUS, Germ.; Schaum, Zool., p. 1893 (1847); T. V. Wollaston, Zool., p. 1574 (1847); Ann. and Mag. Nat. Hist., vol. xviii. 453, tab. ix. A. fig. 3 (1847), *described* "*Hydrop. trifasciatus*."

39. COLYMBETES DISPAR, Bold, Zool., App. p. xxiv. (1849), *described*; Trans. Tyneside Nat. Club, vol. i. 277; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 240, Appendix (1852).

Observation.—Probably not specifically distinct from *Agabus uliginosus*, Payk.

40. AGABUS STRIOLATUS, Gyll.; A. White, Brit. Mus. Cat., Hydrocanth., p. 25 (1847); not *striolatus*, Steph. *sec.* Schaum, Zool., p. 1894 (1847); Babington, Ann. and Mag. Nat. Hist., vol. vi. p. 54 (1840), *described* "*Colymbetes* (*Agabus* § 4) *rectus*."

41. HELOPHORUS RUGOSUS, Oliv.; Murray, Cat. Scot. Col., p. 135 (1853).

42. HYDROCHUS PARUMOCULATUS, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, Appendix, p. 242 (1852), *described*.

Observation.—Mr. Hardy remarks—"I have no record for this beyond finding it in my collection made near Newcastle; I take it to be a foreign insect."

43. OCHTHEBIUS EXARATUS, Mulsant; G. R. Waterhouse, Proc. Ent. Soc. Lond., 4th April, 1853; Ann. and Mag. Nat. Hist., 2nd ser., vol. xi. 480 (1853); Trans. Ent. Soc. Lond., 2nd ser., vol. ii. 231.

44. COLON DENTIPES, Sahlb.; Murray, Cat. Scot. Col., p. 31 (1853).

45. COLON SPINIPES, Haliday, Entom., p. 190 (1841), *described* "*Mylæchus*."

46. COLON FUSCULUS, Eric.; Haliday, Entom., p. 190 (1841), "*Mylæchus*;" Murray, Cat. Scot. Col., p. 31 (1853).

47. COLON CLAVIGER, Hbst.; Murray, Cat. Scot. Col., p. 31 (1853).

48. COLON APPENDICULATUS, Sahlb.; Haliday, Entom., p. 190 (1841), "*Mylæchus*."

49. CATOPS UMBRINUS, Eric.; Murray, Cat. Scot. Col., p. 30 (1853).

50. CATOPS GRANDICOLLIS, Eric.; Murray, Cat. Scot. Col., p. 31 (1853).

51. CATOPS PRÆCOX, Eric.; Murray, Cat. Scot. Col., p. 31 (1853).

52. LEPTINUS TESTACEUS, Müller; Hardy, Zool., p. 2277 (1848), *described*; J. O. Westwood, Proc. Ent. Soc. Lond., 3 Nov. 1851; Zool., p. 3311 (1851); Murray, Cat. Scot. Col., p. 32 (1853).

53. LEIODES VITTATA, Curtis, Ann. Nat. Hist., vol. v. 276 (1840), *described*.

54. Leiodes latifrons, Curtis, Ann. Nat. Hist., vol. v. 276 (1840), *described.*

55. Agathidium pumilum, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, Appendix, p. 244 (1852), *described.*

56. Agathidium Lycogalgæ, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, Appendix, p. 245 (1852), *described.*

57. Agathidium marginatum, Sturm.

Observation.—This specific title, Mr. Wollaston informs me, should be substituted for "*badium*, Eric.," indicated by him with doubt, Zool., p. 1575 (1847).

58. Tychus ibericus, Motsch., Schaum; Zool., p. 1933 (1847); T. V. Wollaston, Zool., p. 3621 (1852).

59. Calodera rubicunda, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 132 (1851), *described.*

60. Tachyusa flavitarsis, Sahlb.; Hardy, Proc. Berwicksh. Nat. Club, ii. no. vi. p. 283; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 128 (1851), *described;* Murray, Cat. Scot. Col., p. 106 (1853).

61. Tachyusa uvida, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 126 (1851), *described.*

62. Tachyusa carbonaria, Mannerh.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 130 (1851), *described;* Murray, Cat. Scot. Col., p. 106 (1853).

63. Homalota Algæ, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 116 (1851), *described.*

64. Homalota nivalis, Kiesenwetter; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 115 (1851), *described.*

65. Homalota immersa, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 118 (1851), *described.*

66. HOMALOTA AUTUMNALIS, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 121 (1851), *comparative characters given*; Murray, Cat. Scot. Col., p. 108 (1853).

67. HOMALOTA CAUTA, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 123 (1851), *described;* Murray, Cat. Col., p. 108 (1853).

68. HOMALOTA CELATA, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 123 (1851), *described;* Murray, Cat. Scot. Col., p. 108 (1853).

69. HOMALOTA HYGROPHILA, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 124 (1851), *described;* Murray, Cat. Scot. Col., p. 108 (1853).

70. OXYPODA TESTACEA, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 113 (1851), *described;* Murray, Cat. Scot. Col., p. 108 (1853).

71. OXYPODA LENTULA, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 114 (1851), *described.*

72. OXYPODA MAURA, Eric.; T. J. Bold, Zool., p. 4038 (1853).

73. PLACUSA HUMILIS, Eric.; Murray, Cat. Scot. Col., p. 110 (1853).

74. MYLLÆNA GRACILIS, Heer; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 109 (1851); Murray, Cat. Scot. Col., p. 110 (1853).

75. GYMNUSA BREVICOLLIS, Payk., Eric.; Haliday, Entom., p. 188 (1841); Hardy, Proc. Berwicksh. Nat. Club, vol. ii. no. vi. p. 283; Steph. Manual, p. 372, 2930 (1839).

Observation.—Stated by Mr. Stephens to have been "improperly recorded as British," and therefore comprised in the present list.

76. Othius 6-punctatus, Haliday, Entom., p. 187 (1841).

77. Quedius oblitteratus, Eric.; T. V. Wollaston, Zool., p. 1576 (1847).

78. Quedius auricomus, Kiesenw.; Murray, Cat. Scot. Col., p. 123 (1853); Hardy, Proc. Berwicksh. Nat. Club, vol. ii. no. v. p. 258 (1847), *described* "*Q. scintillans.*"

79. Raphirus nigricornis, Holme, Trans. Ent. Soc. Lond. vol. iii. 127 (1842), *described.*

80. Lathrobium angusticolle, Boisd. and Lacord.; A. R. Hogan, Zool., p, 4340 (1854).

81. Lathrobium carinatum, T. J. Bold, Proc. Tyneside Nat. Club, 31st of August, 1854; Zool., p. 4483 (1854).* *Described* as follows by Mr. Bold, and represented on the frontispiece, fig. 6:

Deep jet black, very glossy, sparingly clothed with griseous pubescence.

Head large, fully one-third wider than the thorax, orbicular, depressed, closely and very distinctly punctured, with an impression a little before the vertex in front; labrum rufous, fringed with golden hair; mandibles long, curved, prominent, rufous, black on the outer edges, and at the tip; antennæ elongate, as long or longer than the head and thorax together, graceful, rufous; the basal joint with a dusky annulation; palpi also rufous.

Thorax narrow, elongate-oval, much depressed, coarsely

* [(Note by the Editor).—This appears from a paper read by Mr. Janson before the Entomological Society of London, March 5th, 1855, to be identical with the preceding species *L. angusticolle.* It is but just to Mr. Janson to observe, that in enumerating it previously as distinct, he did so on the strength of Mr. Bold's record of the species as an undescribed one; Mr. Janson not having, at that time, had an opportunity of examining the specimens.]

punctulated, with a distinctly elevated central carina, which is exceedingly smooth and glossy.

Scutellum obtusely triangular, punctulated.

Elytra bright blood red, black for one-third the length at the base, distinctly punctulate, somewhat wider than the thorax, parallel, depressed, the suture elevated, with a stria on each side.

Abdomen depressed, strongly margined, very finely punctured, the antepenultimate segment narrowly edged with white, the last sparingly covered by stout black diverging hairs.

Beneath finely punctured and pubescent, black.

Legs elongate, black, the trochanters rufo-brunneous, the apices of the tibia and the tarsi rufous, and covered with aureous pubescence.

Male, with the fifth segment beneath sinuated, the sixth canaliculate.

Female, with the penultimate segment beneath a little produced and rounded.

Length 3—3½ lines.

This very distinct insect is certainly the most beautiful of its genus, the bright blood-red of its elytra contrasting strongly with the shining black of its body; whilst the large orbicular head, narrow carinated thorax, elongate antennæ and legs, give it quite the appearance of a *Stilicus*.

It would appear to be very rare, two specimens only having come beneath my notice: one, a male, I took amongst gravel, near the river Irthing, Cumberland, in June, 1847; the other, a fine female, was captured in a similar locality, on the Devil's Water, Northumberland, by Geo. Wailes, Esq. at the Club's field meeting, in May last.

T. J. B.

82. LITHOCHARIS FUSCULA, Boisd. and Lacord.; T. V. Wollaston, Insecta Maderensia, p. 590 (1854), *described*.

83. STILICUS AFFINIS, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 80 (1851), *described*.

84. SUNIUS UNICOLOR, Curtis, Ann. Nat. Hist., vol. v. p. 277 (1840), *described*.

Observation.—I am unable to decide whether this is identical with *Sunius unicolor* of Stephens, published in the previous year (1839), and have thus included it in the present list: the description is most unsatisfactory. In my MSS. I have placed it with a doubt as a synonym of *Lathrobium obsoletum*, Nordman, Symb. ad Mon. Staph. 146, 18 (1837); *Lithocharis obsoleta*, Eric.; Käfer der Mark Brand., 516, 8 (1839); Gen. et Spec. Staph. 623, 24 (1840).

85. STENUS ATRATULUS, Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 82 (1851).

86. STENUS PUMILIO, Eric.; A. R. Hogan, Zool., p. 4340 (1854).

87. STENUS CONTRACTUS, Eric.; Curtis, Ann. Nat. Hist., vol. v. 277 (1840), *described* "*Stenus basalis.*"

Observation.—This is the *Stenus contractus*, Eric.; Käfer der Mark Brand., p. 573, no. 52 (1839); Gen. et Spec. Staph., p. 744, no. 194 (1840), as indicated by him in his Entom. Report for 1841, p. 23 (Archiv, 1842, vol. ii. p. 211). It is likewise the *Stenus fornicatus*, Kirby, MSS., as incontrovertibly demonstrated by the specimen, still extant in his collection, and having his ticket on the pin; but, unfortunately, neither the insects thus named in the cabinet of the late Mr. Stephens, nor the description published by him, agree with the present insect; the name, therefore, imposed by the learned Entomologist of Berlin will stand by right of priority, he

having first described the species under the name which I have adopted.

88. BLEDIUS SUBTERRANEUS, Eric.; Hardy, Proc. Berwicksh. Nat. Club, vol. ii. no. vi. p. 286; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 87 (1851), *described;* Murray, Cat. Scot. Col., p. 128 (1853).

89. TROGOPHLŒUS SCROBICULATUS, Eric.; Murray, Cat. Scot. Col., p. 129 (1853).

90. THINOBIUS LONGIPENNIS, Heer; Murray, Cat. Scot. Col., p. 129 (1853); A. R. Hogan, Zool., p. 4340 (1854).

91. ARPEDIUM BRACHYPTERUM, Grav., Eric.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 94 (1851), *described;* Murray, Cat. Scot. Col., p. 131 (1853).

92. OMALIUM CONFORMATUM, Hardy; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 97 (1851), *described;* Murray, Cat. Scot. Col., p. 132 (1853).

93. OMALIUM MESOMELAS, Holme, Trans. Ent. Soc. Lond., vol. iii. 128 (1842), *described* "*O. sordidum, var.?*"

94. BOREAPHILUS BREVICOLLIS, Haliday, Entom., p. 187 (1841), *described.*

95. PROTEINUS ATOMARIUS, Eric.; Murray, Cat. Scot. Col., p. 133 (1853); A. R. Hogan, Zool., p. 4340 (1854).

96. SAPRINUS DIMIDIATUS, F.; A. R. Hogan, Zool., p. 1496 (1854).

Observation.—This should probably be *dimidiatus*, Illig., as I find no *Saprinus* (*Hister*) *dimidiatus* in the "Systema Eleutheratorum."

97. ABRÆUS VULNERATUS (Kug.?); J. F. Stephens, Zool., p. 1996 (1848).

Observation.—Mr. Stephens has appended no author's name, either to the present insect or to any of those recorded in the same list. I have added, in parenthesis, and with a mark of doubt, the name of the only writer who, as far as I can ascertain, has de-

scribed a species of *Histeridæ* under this specific title: should my conjecture prove correct, we have here not only a species but a genus new to the British list. *Plegaderus vulneratus*, Kug. [*Hister vulneratus*, Kugel. in Illig. Käf. Preus., 62, 18 (1798)]. *H. vulneratus*, var. b. Gyll. Ins. Suec., i. 97, 29 (1808); Panz. Faun. Ins. Germ. Fas. 37, tab. 6 (1797). *Plegaderus vulneratus*, Eric. in Klug. Jahrb. d. Insekt., 204, 3 (1834).

98. TRICHOPTERYX SERICANS, Heer; A. R. Hogan, Zool., p. 4196 (1854); Murray, Cat. Scot. Col., p. 32 (1853), "*T. depressa*, Sturm."

Observation.—Mr. Wollaston, Insecta Maderensia, p. 107 (1854), adopts for this insect and its allies the generic title *Acratrichis*, published by Motschulsky in 1848; I refer the student to the reasons there adduced for the change thus made in strict conformity with the laws of nomenclature, and for ample generic details.

99. TRICHOPTERYX CURTUS, Alib.; A. R. Hogan, Zool. p. 4196 (1854).

100. PTENIDIUM LÆVIGATUM, Gillm., Erich.; Murray, Cat. Scot. Col., p. 135 (1853).

101. PTENIDIUM APICALE, Sturm. Erich.; Murray, Cat. Scot. Col. p. 135 (1853); A. R. Hogan, Zool., p. 4196 (1854), "*Anisarthria apicalis*, Gyll."?

Observation.—Full generic details and an ample description of the present species will be found in Mr. Wollaston's Insecta Maderensia, p. 110 (1854).

102. ANISARTHRIA PUNCTATA, Gyll.; A. R. Hogan, Zool., p. 4196 (1854).

103. PHALACRUS CASTANEUS, Curtis, Ann. Nat. Hist., vol. v. p. 276 (1840), *described*.

104. EPUREA MELINA, Erich.; Murray, Cat. Scot. Col., p. 135 (1853).

105. RHIZOPHAGUS CŒRULEUS, Waltl.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 247, Appendix (1852); Hardy, Ann. and Mag. Nat. Hist., vol. xix. 379 (1847), *described* "*Rhizophagus cyaneipennis*, Hardy;" Hardy and Bold, Cat. Col. Northumberland and Durham, p. 50 (1848); Schaum, Zool., p. 1888 (1847), "*R. cœruleus*, Waltl.?"

106. DENDROPHAGUS CRENATUS, Payk.; Murray, Cat. Scot. Col., p. 135 (1853); Weaver, Proc. Ent. Soc. Lond., 1st Nov. 1852; Zool., p. 3718 (1852), "*Brontes flavipes*."

107. CRYPTOPHAGUS BADIUS, Sturm; T. J. Bold, Zool., p. 4038 (1853).

108. CRYPTOPHAGUS DENTATUS, Hbst.; T. J. Bold, Zool., p. 4038 (1853).

109. CRYPTOPHAGUS SUBDEPRESSUM, Gyll., T. J. Bold, Zool., p. 4038 (1853).

110. ATOMARIA NIGRICEPS, Erich.; Murray, Cat. Scot. Col., p. 41 (1853).

111. ATOMARIA TURGIDA, Erich.; Murray, Cat. Scot. Col., p. 41 (1853).

112. ATOMARIA TERMINATA, Comolli; T. V. Wollaston, Zool., p. 3622 (1852); Murray, Cat. Scot. Col., p. 41. (1853).

113. ATOMARIA PALLIDA, Wollaston, Ann. & Mag. Nat. Hist., vol. xviii. p. 452, tab. ix. A. fig. 1 (1847), *described*.

114. EPHISTEMUS GLOBOSUS, Waltl., Erich.; T. J. Bold, Zool., p. 4038 (1853).

115. EPHISTEMUS PALUSTRIS, Wollaston, Ann. & Mag. Nat. Hist. vol. xviii. p. 453, tab. ix. A. fig. 2 (1847), *described*.

116. PARNUS MONTANUS, Curtis, Ann. Nat. Hist. vol. v. p. 276 (1840), *described*.

Observation.—I find no mention made of this in any

of the Catalogues, Mr. Curtis's Guide of course excepted; Dr. Erichson is silent with respect to it.

117. HETEROCERUS FEMORALIS, Kiesenw.; T. V. Wollaston, Zool., p. 3622 (1852); A. R. Hogan, Zool., p. 4136 (1854).

118. TRICHIUS ZONATUS, Schmidt, Germar; F. Smith, Zool., p. 2216 (1848), *described.*

119. CETONIA ÆNEA, Gyll.; J. F. Stephens, Zool., p. 1966 (1848); S. Stevens, Proc. Ent. Soc. Lond., 2 Septr. 1850; Zool. p. 2938 (1850); Weaver, Proc. Ent. Soc. Lond., 1 Septr. 1851; Zool. p. 3271 (1851); observations on the habits of the larva, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); J. Scott, Zool., p. 4075 (1853).

120. AMPHIMALLA VERNA, Meg.? S. Stevens, Proc. Ent. Soc. Lond., 2 Sept. 1850; Zool., p. 2938 (1850).

121. APHODIUS LAPPONUM, Gyll.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 142 (1852); Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); Murray, Cat. Scot. Col., p. 48 (1853); T. J. Bold, Zool., p. 4195 (1854); Hardy, Ann. & Mag. Nat. Hist., vol. xix. p. 380 (1847), *described* "*Aphodius subalpinus*, Hardy."

122. APHODIUS ALPINUS, Scop.; T. J. Bold, Zool., p. 4195 (1854).

123. APHODIUS ULIGINOSUS, Hardy; Ann. & Mag. Nat. Hist., vol. xix. p. 382 (1847), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 143 (1852); Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); Murray, Cat. Scot. Col., p. 49 (1853).

124. ANCYLOCHEIRA MAURITANICA, Lucas; F. Bond, Zool., p. 1999 (1847).

Observation.—As my province on the present occasion is merely to enumerate the species recorded to have occurred in Britain since the appearance of Mr. Stephens's Manual, it is clearly incumbent on me to

notice the present insect, which, notwithstanding the softness of its elytra, when first taken, afford perhaps sufficient evidence of its having undergone at least its final metamorphosis in Great Britain, can surely have no claim to admission into the lists of our indigenous species.

125. CARDIOPHORUS FORMOSUS, Curtis; Ann. Nat. Hist., vol. v. p. 278 (1840), *described;* Trans. Ent. Soc. Lond., 2nd ser. vol. iii. p. 15, tab. ii. fig. 6 (1854), *described.*

Observation.—Probably only a variety of *C. sexpunctatus,* an exceedingly variable species, to which Mr. Curtis indicates its near relationship; it is not *Cardiophorus ornatus,* Dej.

126. CARDIOPHORUS TESTACEUS, F.; A. R. Hogan, Zool., p. 4197 (1854).

127. APLOTARSUS MARITIMUS, Curtis; Ann. Nat. Hist., vol. v. p. 277 (1840), *described;* Trans. Ent. Soc. Lond., 2nd ser. vol. iii. p. 15, tab. ii. fig. 5 (1854), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 152 (1851).

Observation.—This is probably a true *Cardiophorus,* but it is certainly not congeneric with the insects placed by Mr. Stephens in his Genus *Aplotarsus.*

128. AMPEDUS TRISTIS, L.; Weaver, Proc. Ent. Soc. Lond., 2nd May, 1853; Zool., p. 3921 (1853); Murray, Cat. Scot. Col., p. 135 (1853), "*Elater.*"

129. AMPEDUS SUBCARINATUS, Germar; Zeitschrift für die Entomologie, vol. v. p. 177, no. 39 (1844); *Ampedus tibialis,* Dej. Cat.; Curtis, Trans. Ent. Soc. Lond., 2nd ser. vol. iii. p. 16, tab. ii. fig. 7, *described;* "*Aplotarsus? cothurnatus,* Curtis."

130. AMPEDUS LUGENS, Redtenbacher, Dissert. Inaug. Vindob. (1842), "*Elater;*" Germar, Zeitschrift, f. d. Entom., vol. v. p. 177, no. 40 (1844); *Ampedus anthracinus,* Dej.

Cat.; Curtis, Brit. Ent., tab. & p. 694; "*Ectinus aterrimus*," but not of Linnæus or Stephens; Trans. Ent. Soc. Lond., 2nd ser. vol. iii. p. 12, tab. ii. fig. 2 (1854), *described*; "*Ectinus? gagates*, Curtis."

131. DIACANTHUS IMPRESSUS, Fab.; S. Stevens, Proc. Ent. Soc. Lond., 6th Feb. 1854; Zool., p. 4234 (1854); J. Foxcroft, Proc. Ent. Soc. Lond., 5th June, 1854; Zool., p. 4386 (1854).

132. DICTYOPTERUS AURORA, Fab.; J. F. Stephens, Zool., p. 2961 (1850); Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852), "*Lycus Aurora*;" Murray, Cat. Scot. Col., p. 56 (1853).

133 TELEPHORUS UNICOLOR, Curtis; Ann. Nat. Hist., vol. v. p. 279 (1840), *described*.

Observation.—Considered by Erichson, Ent. Bericht, for 1841, p. 29; Archiv, 1842, vol. ii. p. 217, as probably not distinct from *Cantharis pilosa*, Payk.

134. TELEPHORUS APICALIS, Curtis; Ann. Nat. Hist., vol. v. p. 279 (1840).

135. RAGONYCHA PALUDOSA, Gyll.; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 156 (1851); Curtis, Ann. Nat. Hist., vol. v. p. 279 (1840), *described*, "*Telephorus Æthiops*, Curtis."

136. PTINUS RAPTOR, Sturm; J. F. Stephens, Entom., p. 200 (1841).

137. BOLITOPHAGUS CRENATUS, Fab.; Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); "*Boletophagus crenicollis*," Proc. Ent. Soc. Lond., 2 May, 1853; Zool., p. 3921 (1853); F. Smith, Proc. Ent. Soc. Lond., 1 Aug. 1853; Zool., p. 4042 (1853); J. Foxcroft, Proc. Ent. Soc. Lond. 6 March, 1854; Zool., p. 2472 (1854); Murray, Cat. Scot. Col., p. 99 (1853), "*Bol. reticulatus*, L."

138. TETRATOMA DESMARETSII, Lat.; J. F. Stephens,

Zool., p. 1996 (1848); E. W. Janson, Zool., p. 2100 (1848), *described;* J. Walker, Zool., p. 3102 (1851); Curtis, Ann. Nat. Hist., vol. v. p. 276 (1840), *described* "*Tetratoma pallida*, Curtis."

Observation.—I am indebted to Mr. Francis Walker for an opportunity of leisurely and carefully examining one of the original specimens described by Mr. Curtis, and which is most unquestionably only a pale variety of Latreille's species, such as I have alluded to, *loc. cit.*

139. DIRCÆA DISCOLOR, Fab.; S. Stevens, Proc. Ent. Soc. Lond., 3 Nov. 1851; Zool., p. 3309 (1851); Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); Murray, Cat. Scot. Col., p. 101 (1853).

140. SERROPALPUS VAUDOUERII, Lat.?; Westwood, Zool., p. 701 (1844).

141. PYROCHROA PECTINICORNIS, Fab.; S. Stevens, Proc. Ent. Soc. Lond., 3 July, 1854; Zool., p. 4419.

142. PYTHO DEPRESSUS, L.; Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1847; J. F. Stephens, Zool., p. 1996 (1848); S. Stevens, Proc. Ent. Soc. Lond., 2 Sept. 1850; Zool., p. 2938 (1850); Weaver, Proc. Ent. Soc. Lond., 1 Nov. 1852; Zool., p. 3718 (1852); Murray, Cat. Scot. Col., p. 100 (1853), (see frontispiece, fig. 7).

143. ANTHICUS FENESTRATUS, Dej. Cat. ?; T. V. Wollaston, Zool., p. 1939 (1847).

Observation.—This insect is now referred by Mr. Wollaston, in his "Insecta Maderensia," p. 536 (1854), to var. β of *A. tristis*, Schmidt.

144. BRUCHUS PISI, L. (*nec* Steph.); J. Walton, Ann. and Mag. Nat. Hist., vol. xiii. p. 206 (1844), *described.*

145. BRUCHUS FLAVIMANUS, Schönh.?; J. Walton, Ann. and Mag. Nat. Hist., vol. xiii. p. 207 (1844), *described.*

146. Bruchus luteicornis, Illig., Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xiii. p. 209 (1844), *described.*

147. Rhynchites Bacchus, L. (*nec* Steph.); J. Walton, Proc. Ent. Soc. Lond., 4th Dec. 1843; Ann. and Mag. Nat. Hist., vol. xii. p. 212 (1843), vol. xiii. p. 88 (1844), *described.*

148. Apion Germari, Walton; Ann. and Mag. Nat. Hist., vol. xiii. p. 456 (1844), *described.*

149. Apion dissimile, Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xv. p. 392 (1845), *described;* S. Stevens, Proc. Ent. Soc., 6th Sept. 1841; Entom., p. 224 (1841); Rev. J. F. Dawson, Zool., p. 2276 (1848).

150. Apion Schönherri (Waterh. MSS.), Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xv. p. 341, (1845), *described;* S. Stevens, Entom., p. 225 (1841); Proc. Ent. Soc. Lond., 4th Sept. 1843.

151. Apion miniatum, Schönh.; A. R. Hogan, Zool., p. 4199 (1854).

152. Apion sanguineum, De Geer, Gyll., Schönh. (*nec* Steph.); J. Walton, Ann. and Mag. Nat. Hist., vol. xiii. p. 452 (1844), *described;* Hardy and Bold., Cat. Col. Northumberland and Durham, p. 173 (1852).

153. Apion cruentatum, Walton, (*sanguineum*, Mus. Steph.); J. Walton, Ann. and Mag. Nat. Hist., xiii. p. 452 (1844), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 173 (1852); Murray, Cat. Scot. Col., p. 80 (1853).

154. Apion Curtisii, Curtis, Ann. Nat. Hist., vol. v. p. 281 (1840), *described;* J. Walton, Ann. and Mag. Nat. Hist., vol. xiii. p. 450 (1844), *described;* S. Stevens, Zool., p. 224 (1841).

155. Apion afer, Schönh.; Murray, Cat. Scot. Col., p. 136 (1853).

156. APION LIVESCERUM, Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xv. p. 400 (1845), *described*; T. V. Wollaston, Zool., p. 413 (1844), under the name of "*A. Hedysari*, Walt."

157. APION PAVIDUM, Germ., Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xv. p. 397 (1845), *described*.

158. APION SEDI, Germar; Rev. J. F. Dawson, Zool., p. 2553 (1849); S. Stevens, Zool., p. 2935 (1850); Murray, Cat. Scot. Col., p. 136 (1853).

159. STROPHOSOMUS HIRTUS, Schönh.; Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 309 (1846), *described*.

160. STROPHOSOMUS FULVICORNIS, Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 307 (1846), *described*.

161. SITONA TIBIALIS, Hbst.; Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 233 (1846), *described*; Hardy and Bold, Cat. Col. Northumberland and Durham, p. 179 (1852).

162. SITONA MELILOTI, Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 232 (1846), *described*; S. Stevens, Zool., p. 750 (1844).

163. SITONA WATERHOUSEI (Schönh. in litt.); Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 234 (1846), *described*; S. Stevens, Proc. Ent. Soc. Lond., 2nd Oct. 1848.

164. POLYDRUSUS PLANIFRONS (Dej. Cat.), Schönh.; J. Walton, Ann. and Mag. Nat. Hist., vol. xvii. p. 18, (1846), *described*.

165. HYPERA TIGRINA (Dej.), Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser., vol. i. p. 298 (1848), *described*; F. Grant, Proc. Ent. Soc. Lond. 2nd Aug. 1852; Zool., p. 3590 (1852).

166. LIMOBIUS MIXTUS, Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. i. p. 300 (1848), *described*; T. V. Wollaston, Zool., p. 1936 (1847), "*Phytonomus mixtus*;" S. Stevens, Proc. Ent. Soc. Lond., 2 Oct. 1848, erro-

neously "*Platyonomus;*" Rev. J. F. Dawson, Zool., p. 2553 (1849); Rev. J. P. Bartlett, Zool., p. 3355 (1852).

167. PROCAS GRANULICOLLIS, Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. ii. p. 168 (1848), *described.*

168. TRACHYPHLŒUS ALTERNANS, Schönh.; Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 222 (1847), *described;* Rev. J. F. Dawson, Zool., p. 2552 (1849).

169. CATHORMIOCERUS SOCIUS, Schönh.; Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 316 (1847).

170. OMIAS BOHEMANNI, Schönh.; T. V. Wollaston, Zool., p. 613 (1844), incorrectly "*Omias Baumanii*, Germ.;" Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 315 (1847), *described;* J. Hardy, Zool., p. 1804 (1847); Hardy and Bold, Cat. Col. Northumberland and Durham, p. 185 (1852); Murray, Cat. Scot. Col., p. 72 (1853).

171. OMIAS SULCIFRONS, Schönh.; R. N. Greville, Zool., p. 340 (1843); T. V. Wollaston, Zool., p. 702 (1844), p. 851 (1845), "*O. sulcirostris;*" J. Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 316 (1847), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 185 (1852); Murray, Cat Scot. Col., p. 73 (1853).

172. OTIORHYNCHUS FUSCIPES, Oliv., Schönh.; Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 449, tab. xv. fig. 10, (1847), *described.*

173. OTIORHYNCHUS EBENINUS, Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. i. p. 302 (1848), *described;* Murray, Cat. Scot. Col. p. 71 (1853); Hardy, Proc. Berwicksh. Nat. Club, vol. ii. no. vi. p. 281.

174. OTIORHYNCHUS SEPTENTRIONIS, Hbst.; S. Stevens, Proc. Ent. Soc. Lond., 6 Nov. 1854; Zool., p. (1854).

175. OTIORHYNCHUS? (*Trachyphlœus*) FISSIROSTRIS (Schönh. in litt.); Walton, Ann. and Mag. Nat. Hist., vol. xix. p. 452 (1847), *described;* S. Stevens, Zool. p. 749 (1844), erroneously "*fuscirostris.*"

176. Pissodes piceæ, Illig., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. i. p. 295 (1848), *described.*

177. Magdalis phlegmatica, Hbst.; Walton, Ann. and Mag. Nat. Hist., vol. xvi. p. 224 (1845), *described;* A. White, Proc. Ent. Soc. Lond., 5th July, 1841; R. N. Greville, Zool., p. 699 (1844); Murray, Cat. Scot. Col., p. 70 (1853).

178. Notaris Scirpi, Fab., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. ii. 167 (1848), *described;* S. Stevens, Proc. Ent. Soc. Lond., 6th Dec. 1841, "*Erirhinus Scirpi,*" Entom., p. 225 (1841), p. 398 (1842); T. V. Wollaston, Zool., p. 174, 179 (1843).

179. Dorytomus pillumus (Sturm), Schönh. (*Bagoüs Beckwithii*, Kirby, MSS.); Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 316 (1851), *described.*

180. Dorytomus validirostris, Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 316 (1851), *described;* S. Stevens, Entom., p. 398 (1842).

181. Dorytomus salicinus, Gyll., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 314 (1851), *described;* T. V. Wollaston, Zool., p. 613 (1844); Murray, Cat. Scot. Col., p. 70 (1853).

182. Dorytomus agnathus, Dahl., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 315 (1851), *described;* Hardy and Bold, Cat. Col. Northumberland and Durham, p. 189 (1852); Murray, Cat. Scot. Col., p. 70 (1853).

183. Dorytomus Salicis, Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 313 (1851), *described.*

184. Elleschus Scanicus, Payk., Gyll., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. vii. p. 317 (1851), *described;* A. R. Hogan, Zool., p. 4198 (1854)?

185. Anthonomus pubescens? Payk., Gyll., Germ., Schönh.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. i. p. 418 (1848), *described;* A. White, Proc. Ent. Soc. Lond.,

5th July, 1841; R. N. Greville, Entom., p. 184 (1841); Murray, Cat. Scot. Col. p. 69 (1853).

186. Tychius nigrirostris, Walton; Rev. J. F. Dawson, Zool., p. 2276 (1848).

187. Micronyx Jungermanniæ, Reich.; S. Stevens, Proc. Ent. Soc. Lond., 3rd July, 1843; Ann. and Mag. Nat. Hist., vol. xvi. p. 65 (1843); Zool., p. 1868 (1847); T. V. Wollaston, Zool., p. 1936 (1847); Rev. J. P. Bartlett, Zool., p. 3354 (1852, "*Tangermanni*" erroneously.

188. Micronyx pygmæus, Curtis; Walton, Proc. Ent. Soc. Lond., 5th July, 1841; Curtis, Ann. Nat. Hist., vol. v. p. 280 (1840), *described "Pissodes? pygmæus;"* S. Stevens, Proc. Ent. Soc. Lond., 2nd August, 1841; 4th September, 1843; Ann. and Mag. Nat. Hist., vol. xvi. p. 66 (1843); Entom. p. 225 (1841); Zool., 2502 (1849).

189. Sibinia potentillæ, Knoch; Rev. J. F. Dawson, Zool., p. 2553 (1849).

190. Acalyptus Carpini, Hbst.; Walton, Ann. and Mag. Nat. Hist., 2nd ser. vol. ix. p. 205 (1852), *described;* S. Stevens, Zool., p. 3186 (1851); Proc. Ent. Soc. Lond., 7th July, 1851; Zool., p. 3212 (1851).

191. Phytobius velatus, Beck; S. Stevens, Entom., p. 225 (1841), "*Pachyrhinus villatus.*"

192. Phytobius velaris, Gyll.; S. Stevens, Entom., p. 398 (1842), "*Pachyrhinus villaris;* T. V. Wollaston, Zool., p. 1573 (1847).

193. Phytobius Waltoni, Schönh., T. V. Wollaston, Zool., p. 850 (1845); "*Pachyrhinus,*" p. 3621 (1852), "*Phytobius velaris* of British Cabinets, but not of Gyllenhal," Zool., p. 412 (1844), "*Pachyrhinus notatus.*"

194. Trachodes hispidus, Linn., Germ., Schönh.; Walton, Ann. & Mag. Nat. Hist., 2nd ser., vol. ix. p. 204 (1852), *described;* J. Walker, Zool., p. 3102 (1851); F. Bates,

Zool., p 4437 (1854); S. Stevens, Proc. Ent. Soc. Lond, 7th Aug. 1854; Zool., p. 4450 (1854).

195. BAGOUS TEMPESTIVUS, Hbst.; S. Stevens, Entom., p. 398 (1842).

196. CEUTORHYNCHUS DEPRESSICOLLIS, Gyll., T. V. Wollaston, Zool., p. 850 (1850); "*Nedyus impressicollis*, Little;" Murray, Cat. Scot. Col, p. 63 (1853).

196*. CEUTORHYNCHUS SETOSUS, Schönh.; T. V. Wollaston, Zool., p. 412 (1844), "*Nedyus setiger*."

197. CEUTORHYNCHUS VIDUATUS, Gyll.; A. White, Proc. Ent. Soc. Lond., 5 July, 1841; R. N. Greville, Entom., p. 184 (1841); Zool., p. 699 (1844); T. V. Wollaston, Zool., p. 850 (1845); Murray, Cat. Scot. Col., p. 64 (1853).

198. CEUTORHYNCHUS AUBEI, Schönh.; Rev. J. F. Dawson, Zool., p. 2553 (1849) "*Nedyus*," Zool., p. 2276 (1848), "*Nedyus Crux*, Walt. MSS."

199. CEUTORHYNCHUS URTICÆ, Schönh.; T. V. Wollaston, Zool., p. 412 (1844), "*Nedyus Urticæ*, Walton."

200. CEUTORHYNCHUS RAPÆ, Gyll.; S. Stevens, Entom., p. 397 (1842), "*Nedyus syrites*," Germ."

Observation.—Mr. Stevens informs me that Mr. Walton now considers this insect to be the *Rapæ* of Gyll., not *syrites*, Germ.

201. CEUTORHYNCHUS HIRTULUS, Germ.; Rev. J. F. Dawson, Zool., p. 2553 (1849).

202. CEUTORHYNCHUS CYANIPENNIS, Illig.; R. N. Greville, Entom., p. 184 (1841), "*Nedyus*;" J. F. Stephens, Entom., p. 200 (1841), "*Nedyus*;" Murray, Cat. Scot. Col., p. 65 (1853).

203. RHINONCHUS BRUCHOIDES, Hbst.; T. V. Wollaston, Zool., p. 850 (1845), p. 1940 (1847), p. 3621 (1852), Rev. H. Clark, Zool., p. 3706 (1852).

204. TAPINOTUS SELLATUS, Fab.; T. V. Wollaston, Zool., p. 1517 (1846).

205. GYMNÆTRON PASCUORUM, Gyll.; Murray, Cat. Scot. Col., p. 62 (1853).

206. GYMNÆTRON VILLOSULUS, Schönh.; Murray, Cat. Scot. Col., p. 62 (1853).

207. GYMNÆTRON VERONICÆ, Germ.; S. Stevens, Entom., p. 225 (1841); T. V. Wollaston, Zool., p. 750 (1844), p. 850 (1845), p. 1940 (1847); Rev. J. F. Dawson, Zool., p. 2553 (1849); T. V. Wollaston, Zool., p. 3621 (1852).

208. GYMNÆTRON NIGER, Germar; T. V. Wollaston, Zool., p. 1940 (1847); H. W. Bates, Zool., p. 1998 (1848); Hardy, Proc. Berwicksh. Nat. Club, vol. ii. no. vi. p. 280, "*G. nigrum;*" Hardy and Bold, Cat. Col. Northumberland and Durham, p. 199 (1852); F. Bates, Zool., p. 2438 (1849).

Observation.—Mr. Wollaston, Zool., p. 1941 (1847), expresses considerable doubt concerning the claims of this insect to be separated specifically from *Veronicæ*.

209. GYMNÆTRON ROSTELLUM, Hbst.; Rev. J. F. Dawson, Zool., p. 2553 (1849); Murray, Cat. Scot. Col., p. 135 (1853).

210. GYMNÆTRON NOCTIS, Hbst.; A. R. Hogan, Zool., p. 4197 (1854).

211. MECINUS COLLARIS, Germ.; S. Stevens, Zool., p. 3186 (1851); Proc. Ent. Soc. Lond., 7 July, 1851; Zool., p. 3212 (1851).

212. PENTARTHRUM HUTTONI, Wollaston, Ann. and Mag. Nat. Hist., 2nd ser. vol. xiv. p. 129 (1854), *described.*

213. XYLOTERUS LINEATUS, Oliv., Gyll., Eric.; Entom. Report for 1841, p. 55 (Archiv, 1842, vol. ii. p. 243); Curtis, Ann. Nat. Hist., vol. v. p. 279 (1840), *described* "*Bostrichus Waringii*, Curtis."

214. CALLIDIUM LURIDUM, Fab.; Hindley, Entom., p. 203 (1841).

Observation.—Described by Mr. Stephens, Illustr. Mand. vol. iv. p. 248 (1831); Manual, p. 275, 2148 (1839); but considered by him to have been "erroneously indicated as British," and therefore included in this list.

215. EUMOLPUS HOBSONI, Curtis, Ann. Nat. Hist., vol. v. p. 281 (1840), *described.*

Observation.—I am unable to determine whether or not this is really the insect given by Mr. Stephens, Manual, p. 309 (1839), as a var. of *Chrysomela lamina*, and have therefore enumerated it in this list.

216. CHRYSOMELA MARGINALIS, Dufts. var.; Murray, Cat. Scot. Col., p. 91 (1853).

217. CHRYSOMELA SPARSHALLI, Curtis, Ann. Nat. Hist., p. 282 (1840), *described.*

218. HALTICA PUBESCENS, Ent. Heft.; Rev. H. Clark, Zool., p. 3706 (1852).

219. HALTICA FUSCIPES, Fab.; Murray, Cat. Scot. Col., p. 88 (1853).

220. HALTICA DISPAR, Rudd; Zool., p. 1517 (1840), *described.*

221. LONGITARSUS APICALIS, Waterh. MSS.; T. V. Wollaston, Zool., p. 889 (1845); Rev. J. F. Dawson, Zool., p. 2114 (1848); Hardy and Bold, Cat. Col. Northumberland and Durham, p. 214 (1852), *described;* Murray, Cat. Scot. Col., p. 89 (1853).

222. MACROCNEMA SPERGULÆ, Gyll.; R. N. Greville, Zool., p. 340 (1843); T. V. Wollaston, Zool., p. 477 (1844).

223. COCCINELLA LABILIS, Mulsant; J. F. Stephens, Zool., p. 1865 (1847), *described.*

224. SCYMNUS ANALIS, Fab. (*nec* Steph.); Murray, Cat. Scot. Col., p. 95 (1853).

225. ORTHOPERUS CURVIMANUS, Mots.; Rev. H. Clark, Zool., p. 3706 (1852).

226. MONOTOMA GRACILIS, Curtis, Ann. Nat. Hist., vol. v. p. 277 (1840), *described*.

227. LATRIDIUS MINUTUS, L.; A. R. Hogan, Zool., p. 4196 (1854).

IMPORTANT NEW WORKS

ON

ENTOMOLOGY.

During the past year Five Entomological Works of considerable importance have appeared. These we will notice in the order of publication.

THE ENTOMOLOGIST'S COMPANION, by H. T. STAINTON. Second Edition, pp. 146. London: John Van Voorst. Price 3*s*.

CONTAINING:—How to catch Micro-Lepidoptera—Where to catch Micro-Lepidoptera—When to catch Micro-Lepidoptera—To collect the Larvæ of Micro-Lepidoptera—Table of Appearance of British Tineina—Calendar of British Tineina appearing in the Imago state—On the Habits of Tineina larvæ—Calendar of British Tineina appearing in the Larva or Pupa state—How to rear Micro-Lepidoptera from the Larvæ—How to kill Micro-Lepidoptera—How to set Micro-Lepidoptera—Entomological Localities—Ten days at Kilmun, with a Trip to the Isle of Arran—On the Necessity of the Collector keeping a Journal—Journal of a Larva Collector for 1853.

"The present volume is more than an amplification and correction of its predecessor. It has been my aim, by the insertion of more readable matter, to render the 'Companion' more entertaining, without sacrificing any of its usefulness, and without enhancing the cost.

"One main object of this book is to induce Entomologists to observe and record their observations. We must multiply the number of observers. Every nook and corner must be ransacked by some observing Entomologist; and the more labourers in the field the sooner will the harvest be gathered in."—*Preface.*

"For those interested in the study of the smaller moths, this book will be found of great use: the ways of catching, keeping, rearing, killing and setting these minute creatures are fully detailed."—*Athenæum.*

"This edition presents several new features; firstly, some fourteen pages devoted to the Entomological localities in the neighbourhood of London, with the means of getting to them, and what to be found in them fully detailed. To the London Entomologist this will, we think, prove a welcome addition; secondly, we have an account of ten days at Kilmun, with a trip to the Island of Arran; and lastly, we have the journal of a Microlepidopterist for the year 1853, which may fairly stand as a model of such things. This volume should be found in every collector's possession; as a handbook they will find it invaluable."—*Natural History Review.*

GEODEPHAGA BRITANNICA; a Monograph of the Carnivorous Ground Beetles indigenous to the British Isles. By JOHN FREDERICK DAWSON, LL.B. Coloured Plates. London: John Van Voorst. Price 12s.

"In consequence of a suggestion made to me by several of my entomological friends and correspondents, I have been induced to undertake, and at length to publish, a specific arrangement of the carnivorous ground beetles indigenous to the British Isles, a group to which I have paid much attention. . . . . I have been unwilling to reject any reputed indigenous species which I felt I could reasonably retain; and yet, after full consideration, have been compelled to reduce their aggregate amount very considerably, either because many of them are evidently varieties of others, or because no sufficiently conclusive evidence exists to warrant their retention in the British Fauna."—*Preface.*

"From a comparison of Mr. Dawson's Tabula Specierum with the corresponding portion of Stephens's Manual, we find in the latter 449 species, while in Mr. Dawson's list there are

only 294; in other words 155 species, or about one-third of the whole, have disappeared. Perhaps we may be permitted to doubt whether still further investigation may not lead to the re-admission of some of the species rejected by Mr. Dawson; at any rate it will be interesting, and possibly useful, to collect such gleanings of information about any of them as may tend, however slightly, to bring the question of their authenticity to a final issue. The pervading spirit of Mr. Dawson's Monograph is that of determined compression. Thoroughly dissatisfied with the received arrangement, and continually complaining of the confusion into which it has been thrown, the author has set himself in good earnest to simplify as much as possible; he has applied himself to his task with most laudable patience and assiduity, and has evidently turned to good account the great advantages of which he was possessed. In conclusion, we will only express our opinion that Mr. Dawson has produced a very original and useful Monograph, and we hope that many other Entomologists may be incited to follow his example."—*Natural History Review.*

"A work that bears internal evidence of invincible assiduity and a profound knowledge of the subject. This volume is less remarkable for the amount of new matter it contains than for the mass of old and worthless matter which it sweeps away. Nothing was ever more extraordinary than the wholesale destruction of names which Mr. Dawson has achieved. Those entomologists who had reserved long gaps in their cabinets, under the fond idea that these were to be eventually filled, now find that half the names for which this extensive accommodation was prepared actually signify nothing, while a large portion of the remaining moiety is comprised of names erroneously applied. . . I think that every British Coleopterist is bound to possess himself of this valuable volume."—*Address of the President of the Entomological Society of London, January,* 1855.

INSECTA BRITANNICA. LEPIDOPTERA: TINEINA. By H. T. Stainton. With Ten Plates. London: Lovell Reeve, Henrietta Street, Covent Garden. Price 25*s*.

"The object of this volume is to furnish descriptions of all the species of Tineina (a group of Lepidoptera) at present known to inhabit Great Britain, and, at the same time, to give as much information concerning their habits and transformations as the limited space would allow. Of the ten plates, which have been carefully executed by Mr. Wing, eight illustrate the generic characters, one the various forms of the larvæ, and one the perfect insects of several of the most important genera (especially representing those which have any peculiarity in their posture when in repose)." —*Preface.*

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"We must not close our notice of this volume, without stating that it is the result of three several visits to the Madeira islands—two winters and one summer having been spent in collecting materials. During the summer expedition, the author sojourned for some time in the mountains, taking with him his tent. He speaks with enthusiasm of the beauty of the mountain scenery of Madeira, and of the deliciousness of a tent life in these commanding positions. As a contrast to the delight he experienced in his scientific researches, he refers to the *ennui* of the majority of those who seek Funchal for the benefit of their health, in the absence of any occupation that would withdraw their minds from the maladies under which they suffer. To all such Mr. Wollaston's book will be a treasure as a guide to the localities where they may meet with interesting objects, the search after which seems to have restored his own health, and the description of which here given will gain for him a reputation as an accurate Entomologist."—*Athenæum*.

"But the most important and valuable work I have to notice, and the one which, as a work of science, will confer most honour on this country, is the 'Insecta Maderensia' of Mr. Wollaston. This work is distinguished throughout by persevering industry, profound knowledge, and philosophical spirit. Nothing can exceed the industry with which the author has pursued his object, a fact that will be sufficiently evident when I state that he has described 213 genera, and 482 species of Madeiran Coleoptera, out of which 41 of the genera, and 270 of the species, are now characterized for the first time, and are therefore absolutely new to science. With regard to the solid Entomological knowledge possessed, and in every page made manifest without display, there can be but one opinion, for not a single species or genus is mentioned unaccompanied by the evidence of a perfect knowledge of its antecedent history: this, I am

aware, is very high praise, but it is praise which no one can say is unmerited. The philosophical spirit is manifested equally in the masterly characters given of every genus and species, and in the explanatory remarks which invariably follow each description; and I must not omit to add, that these descriptions and remarks are invaluable to the British Coleopterist, because a large proportion of the genera described, and cited for comparison, are familiar to us as indigenous to Britain."—*Address of the President of the Entomological Society of London, January*, 1855.

Mr. Wollaston, who has again started for Madeira, with the intention of prosecuting his Entomological studies in those islands, around which his book has shed a halo of Entomological glory, when almost on the eve of starting furnished us, at our request, with the "Instructions in Collecting and Preserving Coleoptera," given at p. 101 of this Annual; and we trust that many of the readers of those "Instructions" will feel a desire to make further acquaintance with the Author, and we are satisfied that all who, acting upon that feeling, once obtain a sight of the "Insecta Maderensia," will be anxious to possess it. It is unfortunate, in one respect, that the work is *so well got up*, for though published at an unremunerative price, it is still far too expensive for the pockets of ordinary Entomologists. Judging from the appearance of the book, with its large quarto pages of goodly paper and broad margins, with clear type, we should say it was specially designed for the same class of readers who so greedily devoured "Childe Harold," when it appeared in a similar form; but are there, among these higher classes, any readers of Entomological works? That is certainly the problem which Mr. Wollaston's book will solve; it will *not* reach those who now can appreciate its value: will it, by its attractive exterior, engage the attention of others who may by it be won to a love of Entomology?

Geology has long been a fashionable science, and the President of the British Association for the ensuing meeting (the Duke of Argyll) is known as a good geologist; why should not Entomology be also represented in the House of Lords and in the Cabinet?—*Editor of the Entomologist's Annual.*

THE BUTTERFLIES of GREAT BRITAIN, with their TRANSFORMATIONS. Delineated and described by J. O. Westwood, Esq., F.L.S., with Nineteen Coloured Plates. London: W. S. Orr & Co. Price 15*s.*

This volume, according to the preface, *may* be considered as a re-issue of "British Butterflies and their Transformations," a work which, generally known as "Humphreys and Westwood," has never been regarded with favour by the Entomologists of the present day; but the object being 'to re-issue it at a price which would place it within the reach of every student,' the size as well as the bulk of the work has been reduced, and Mr. Westwood has himself drawn a set of fresh plates, and only those species are introduced which are enumerated as British in Stephens's Museum Catalogue: it may therefore be readily understood that it is a *vast improvement* on the work of which it professes to be a re-issue, and will no doubt be found of very great use by incipient collectors. It is very interesting to notice the extent of our ignorance on many parts of the Natural History of our few species of Diurnal Lepidoptera, some idea of which may be formed from the following queries, to which we should be very glad to receive answers.

1. *Papilio Machaon.* Are there one or two broods in the year?
2. *Colias Hyale.* Is this double-brooded on the Continent?

3. *Melitæa Selene* and *Euphrosyne*. It would be very desirable to ascertain, *with certainty*, whether either of these species occur in the autumn.
4. *Argynnis Lathonia*. Continental Entomologists can surely at once decide whether there are one or two broods of this in the year.
5. *Vanessa C. Album*. Has not occurred near London for many years: where is it now met with?
6. *Hipparchia Semele*. "It forms a cocoon in the earth, according to M. Marloy:" having seen the naked suspended pupa, as figured by Mr. Westwood, we suppose M. Marloy must have been *quizzing* him.
7. *Hipparchia Tithonus*. *Does* the larva of this species feed on the Hieracium Pilosella?
8. *Oreina Ligea*. If this be really a British species, why does not some enterprising Scotchman rediscover it?
9. *Thecla Quercus*. A writer in "Loudon's Magazine of Natural History" states "that the caterpillar of this species goes underground to effect its transformations:" surely there is some error of observation here; can any one confirm this statement?
10. *Thecla Rubi*. Is there a second brood of this species in August?
11. *Polyommatus Œgon*. Is not this common on moors in the North of England?
12. *Cyclopides Paniscus*. Is there not a brood of this in July or August?
13. *Pamphila Comma*. Is there not a brood of this in May? And the same remark may apply to *P. Linea*, and probably also to *P. Actæon*; but who ever makes excursions into Dorsetshire so early in the year?

Another point on which the deficiency of our printed information respecting British Butterflies is very striking, is their geographical distribution. All the old localities are carefully brought forward here, though many of them have been long deserted by the respective species; and, on the other hand, localities where species not of *general occurrence* are still continuously taken, are unnoticed and unrecorded. Would that each Entomologist would prepare a list of the Butterflies occurring in his own locality, noting their times of appearance, and any peculiarity of habit, and, where possible, the food-plant and habit of the larva! At small trouble to each individual, an idea of the distribution of each species might be satisfactorily obtained, and increased stimulus given to the study of the British Butterflies.—*Editor of The Entomologist's Annual.*

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THE

ENTOMOLOGIST'S ANNUAL

FOR

MDCCCLVI.

Λαμπάδια ἔχοντες διαδώσουσιν ἀλλήλοις.

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JOHN VAN VOORST, PATERNOSTER ROW.

MDCCCLVI.

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PREFACE.

"THE ENTOMOLOGIST'S ANNUAL" now for the first time appears in that developed form in which our mind's-eye had clothed it from the first.

It now contains papers purely scientific, and others principally of an amusing nature, and by this mixture it attains its *maximum* of usefulness; it will be read by thousands who are no Entomologists—may it not exercise such an influence on some of these, that before two years have elapsed they may find themselves enumerated in our "List of British Entomologists?"

It continues cheap, because it still seeks to extend its circulation among the working collectors, and to those who are not habitual book-buyers, the *price* of a book is a very important consideration.

The following extract from a communication by Mr. Thomas Edward to the "Banffshire Journal" of February 14th, 1854, confirms our view of the necessity of diffusing a knowledge of Natural History amongst labouring men engaged in out-door occupations.

"I am fully persuaded in my own mind, from what I know, that if our gamekeepers, gardeners and farm-servants, and others whose out-of-door occupations bring them in constant contact, as it were, with the works of Creation, would

but become observers of nature, a great many more additions to our Fauna would soon be made, and something like an adequate knowledge of our natural productions would be gained. I maintain that none have it so well in their power to become acquainted with the works of nature, and to add to our knowledge in that respect, as they have, if they but *would;* and yet they are about as ignorant on the subject, if not more so, than those whose occupations confine them in the house from morning till evening, with scarce a ray of sunshine to cheer them as they ply their wearisome toil, and who can only enjoy the beauties and sweets of Nature by snatches, stealing, as it were, an hour now and then from their scanty store to breathe the refreshing air of heaven, and hold communion with the works of the Creator. And why? Why just because they *will* not. They, like many more, go about in, what may be termed, a state of daylight somnambulism—that is, with eyes and ears both open, and yet they neither see nor hear any of these things."

But, however desirable it may be to enlist the unlearned as observers, it is not necessary to write down to the level of their ignorance; yet this is what many contend should be done, and we are gravely told that we ought to give all the insects *English* names, and that this would have the effect of making the Annual more generally interesting.

But what *is* a name? A name is that appellation by which a thing is known, but by what English appellation is *Phlogophora empyrea* known? It bears no English name at present, and, consequently, is not yet known by any. But suppose we were to give it a name: then each person who learns its new English name has to learn its English name

and its Latin one; for if he only learns its English name he will meet shoals of people who have only learnt the Latin designation, and to whom he would therefore have to explain that, when he said so-and-so, he meant *Phlogophora empyrea*. Is it not much simpler for him to learn to say *Phlogophora empyrea* at once? To have to learn two sets of names, an English set and a Latin set, is giving one's self unnecessary trouble. English names are frequently excessively local; a moth will be called by the collectors of one town by one English name, whilst the collectors in another town will call it something quite different. Even the English names occurring in books are not always the same, and we find one set of names in Rennie, where the butterfly figured on our wrapper is called "the Primrose," and another set of names in Wood.

A recent writer in "The Naturalist" expatiated on the pleasure of discovering the name of a butterfly in plain English, though the instance he selected was rather unfortunate, for he found in "Morris's British Butterflies," that the "ugly Latin, *Hipparchia Ægeria*," was replaced by the "plain English, *The Wood Argus*." Now, in the first place, we are not aware that *Argus* is more English than *Ægeria*; and in the second place, the name "*Wood Argus*," however familiar it may be in Yorkshire and Derbyshire, is never used near London to express "*The Speckled Wood*." Indeed, the whole observation reminds us excessively of the old stage coachman's remark as to the difference between a railway accident and a coach upset:—"Why," says he, "if the *train* comes to a smash, and you get thrown off the line, *where are you?* but if the *coach* overturns into a hedge or ditch, *there you are!*"

The following passage in the New Quarterly Review has considerable bearing on the question how far it is desirable to write down to a low level in order to conciliate the many:

"The public very naturally buy only such books as they like and are able to comprehend. They have a superficial smattering of every thing, and pass summary judgments accordingly. The press as naturally humours the public, and praises or condemns in keeping with public prejudices; the consequence of which is, that a writer, in order to be popular, is unfortunately obliged to follow and truckle to understandings infinitely below his own. However great his heart or genius, however well qualified he may be to lead men onwards to lofty efforts and noble aims, it is of the first importance to his fame, and his very existence as an author, to conciliate his readers. If his works cannot command a sale, he cannot be properly called an author. However truthful or profound, if he ceases to please, he ceases to exist; the result is, that books are written to please the majority."

But we trust we have sufficient resolution to write what we consider *good* for the majority, whether it actually *please* them or not; we have no notion of treating our public like a spoiled child, and giving them whatever they ignorantly clamour for, even though its tendency may be to aggravate their particular disease. We are quite willing to hear all sides; but having done so, we must be allowed to judge for ourselves what is best, both for us and for our readers.

One result which we foresee from the success of "The Entomologist's Annual" is a series of scientific Annuals on

other branches of knowledge. Indeed very useful Annuals may be brought out on subjects not exactly scientific.

Already following in our wake, the Post Office, the most go-a-head department of our Government, has brought out its Annual, with an account of "the progress, changes and improvements effected in the various departments of Post Office" during the year 1854. Like the Entomologist's Annual for 1855, this Post Office Annual begins by stating what had been done in previous years, and then enters more into details, in the part corresponding to our "New British Species in 1854." It also further carried out our idea of introducing amusing chapters; and the story of the old woman who lived in a house between a No. 14 and a No. 16, but whose street door was ornamented with a brass number 95, it having been the number of a house she had formerly lived at in another street, and "which (meaning the brass plate) being a very good one she thought would do for her present residence as well as any other," is well told at page 101.

Here, however, the similitude between the two Annuals ceases, more especially if we look at the colours of the wrappers; ours was a *yellow* book, the Post Office Report was a *blue* book.*

* While alluding to the Post Office, I wish to suggest that a monthly publication of all the Foreign and Colonial Postage Rates, with regulations for letters, newspapers, and books, both at home and abroad, would be very serviceable to many people. Why should not the Post Office have its own Bradshaw? If people could tell by it, at a glance, what the postage was on a letter from here to such a place, and how long the letter would be in transit, many more foreign letters would be posted, and the revenue would be increased. Those who are in the habit of writing letters to residents abroad *get to know* all these matters, but how many there are who do not write simply because they *do not know!*

Lest any of the readers of the Annual should complain of our Plate this year being exclusively devoted to *Lepidoptera*, it is but fair to ourselves to state that some figures of other orders would willingly have been introduced, but those engaged on the other orders were unable to recommend any species for that purpose; one correspondent, it is true, did recommend one Beetle to be figured, but his recommendation arrived just when the Plate was already completed!

Entomology is coming rapidly into notice as an attractive branch of science; it is difficult to take up any work of our greatest literary characters, without finding some allusion either to Entomology or Entomological pursuits; even in the first number of "Little Dorrit," Mr. Meagles states in reference to his dread of the plague while in quarantine at Marseilles,—"Why, I'd as soon have a spit* through me, and be stuck upon a card in a collection of beetles, as lead the life I have been leading here;" and Bulwer Lytton, in the "Caxtons," devotes a whole chapter to the earwig, informing his readers that the insect which attracted his attention, or rather *dis*tracted it, "was certainly larger than an earwig. It might have been one of that genus, in the family of *Forficulidæ*, called *Labidoura*—monsters, whose antennæ have thirty joints! There is a species of this creature in England,

* The word *spit* is thoroughly Entomological, being employed to designate great clumsy pins, such as should *not* be used; but the Author was in error in assuming that a beetle was first pinned, and then stuck on a card—those that are pinned not being mounted on cards, and *vice versâ* —at least this is the case at the present day, but perhaps in Mr. Meagles' time it may have been different.

but to the great grief of naturalists, and to the great honour of Providence, very rarely found, infinitely larger than the common earwig." This scientific information occurs in Chapter III., Part VII., of that clever novel.

Several of the suggestions received from correspondents on the appearance of "The Annual" last year are now in process of being carried out, and we shall be very thankful to receive any further suggestions. The object of the Annual is to be *useful;* and if its utility can be in any way increased, we shall be happy to profit by the ideas of others, having a firm conviction that when new ideas are not accepted simply because not our own, it will be a sign of old age and a warning that it is time to retire from the Editorship of "The Entomologist's Annual."

I would hope that each Entomologist who reads these pages will not only derive pleasure and instruction from them, but also find *his usefulness increased.*

H. T. STAINTON.

Mountsfield, Lewisham,
December 7th, 1855.

CONTENTS.

"A frightful majority of our middle-class young men are growing up effeminate, empty of all knowledge but what tends directly to the making of a fortune; or rather, to speak correctly, to the keeping up the fortunes which their fathers have made for them; while of the minority, who are indeed thinkers and readers, how many women as well as men have we seen wearying their souls with study undirected, often misdirected, craving to learn, yet not knowing how or what to learn; cultivating, with unwholesome energy, the head at the expense of the body and the heart; catching up with the most capricious self-will one mania after another, and tossing it away again for some new phantom; gorging the memory with facts which no one has taught them to arrange, and the reason with problems which they have no method for solving, till they fret themselves into a chronic fever of the brain, which too often urges them on to plunge, as it were, to cool the inward fire, into the ever-restless sea of doubt and disbelief. It is a sad picture. There are many who may read these pages whose hearts will tell them that it is a true one. What is wanted in these cases is a methodic and scientific habit of mind, and a class of objects on which to exercise that habit, which will fever neither the speculative intellect nor the moral sense, and those physical science will give, as nothing else can give it."—*Kingsley's Glaucus*, p. 45.

ADVANTAGES

OF THE

STUDY OF NATURAL HISTORY.

(By the Editor.)

The study of Natural History, taken in its widest signification, means the study of all creation; taken in its more restricted sense, it is confined to Zoology and Botany; but when it is considered that Geology contains the records of the Zoology and Botany of a past age, and that the forms so preserved for our investigations are frequently of invaluable assistance to us in supplying links in the great chain of nature, it is evident that Geology forms no mean branch of Natural History,—and a knowledge of the facts of Astronomy, the different circumstances in which the various members of our own system are placed, and the analogy of other systems at distances so remote as to be almost beyond our comprehension, cannot but be of use to the student in enlarging his ideas.

Study is generally divided into two branches; in the first place, the study of language; secondly, the study of pure science. The study of language is necessary in order to enable us to express our ideas, but then it might be advisable to pursue some other study which would give us ideas to be expressed; to be master of the art of expressing ideas, and at the same time barren of the art of producing them, is like the possession of a knife and fork without possessing a joint

whereon to use them. The study of pure science possesses uncommon fascinations for many minds; it enables the student to abstract himself entirely from the external world, to find pleasures in himself and by himself, and as encouraging the faculty of concentrating the attention upon any particular subject is a very desirable study for the young. *Few habits are more desirable of cultivation than a habit of attention.*

The study of Nature has hitherto been placed too much beyond the pale of ordinary education; yet it, too, has its fascinations for the young, and we hope the time is not distant when those in whom this bias exists will have it cultivated, instead of repressed, by those who have the superintendence of their education.

One great advantage of this study is, that it is one not to be obtained to any considerable extent from books alone—it compels us to seek the objects themselves; we thus obtain a knowledge of the subject for ourselves quite independent of the instrumentality of another person, and this is a very important matter; when we thus *examine* and *observe* for ourselves we feel a far greater ownership in the knowledge so obtained than we can ever feel in any information we derive from learning a passage in a book by heart. A person may learn a great deal from books, and yet, from a want of observation, may be unable to read the pages of the book of nature, daily spread out before us, ever fresh and ever interesting.

The child who has learnt to distinguish a swallow from a marten and from a swift, is not likely to remain contentedly in ignorance of the distinctions by which other closely allied species are distinguished. To him the sight or sound of a troup of swifts will convey pleasurable sensations, to which he who looks on them merely as birds, or as swallows, must ever remain a stranger.

The child who, from studying Botany, has learnt not only

to recognise many a flower at sight, but also to know by what little peculiarities it is that he does recognise them, has learnt the value of having fixed, determinate ideas; and how many there are who pass through life in a semi-dreamy state, without giving their *attention* to anything, or being able to form fixed, determinate ideas.

The neglect which the study of Natural History has hitherto had to endure at all our great seats of learning, is one of those things which fifty years hence people will look back and wonder at. An instance came to my knowledge lately of a clergyman, in Dorsetshire, who laughed heartily at his pupil (a youth of nineteen) for being so ignorant as to state that a whale was not a fish; the clergyman had graduated at Oxford, and believed a whale to be a fish! And he was not a very old clergyman either. I quote this as an instance of the want of knowledge that an Oxford graduate may possess; indeed, it has been well observed by Lord Rosse, that "a man having taken a first-class *in literis humanioribus*, may be ignorant of physics in the most elementary form, and be incapable of comprehending the first principles of machinery and manufactures, or of forming a just and enlarged conception of the resources of this great country."

But what we advocate for the study of Natural History is, not that it should be merely tolerated, but that it should be placed on a footing of perfect equality with the study of Classics or Mathematics. As a mental discipline it has quite the same advantages; it inculcates accuracy and precision quite as much as the study of Mathematics; and further, it develops the faculties of *observation* which are not employed at all in the other branches of education. All minds are not so constituted as to enjoy in an equal degree Classics or Mathematics; to some Classics are a great bore; for others Mathematics have no charms: some, perhaps, cannot abide

either; yet, were a course of study of Natural History open to them, the spark within them might have been touched, their interest awakened, and they would thus obtain all the good effects of education. On this subject the Rev. Henry Moseley writes as follows:—

"The sciences of observation and experiment afford, in this point of view, resources of education which it is lamentable we should neglect as we do. I believe that many a youth, who has but little taste for the learning which is prescribed for him at school, and for that reason devotes himself to it with but little zeal and gives it up as soon as he is able, might, if the alternative had been allowed him of pursuing those other subjects, have compassed through their means all the highest results of education." And we trust that this consideration will be thoroughly laid to heart by all "parents and guardians."

Moreover, with many their studies are put aside when they leave college never to be resumed, and the "equations of curves," or "a consideration of the causes which led to the second Peloponnesian war," are not often taken up as matters of amusement during leisure hours. Yet the mind must have some food as well as the stomach; to dose it with the frivolities of fashionable dissipation,—to cram it with all the novels of the season, is like overloading the stomach with pastry and confectionery, and giving it no solid food; the mind, like the stomach, becomes weakly and irritable by such treatment. Now, the study of Natural History is just midway between the abstruseness of political economy, or of the past history of the human race, and the extreme lightness of most of the novels of the present day; it is as interesting as a novel, but gives the same employment to the higher faculties of the mind as are afforded by the abstruser studies of Political Economy and History. To those engaged with these latter graver pursuits, it would afford a pleasant change

of occupation without producing the sensation of their time being thrown away, which is not unfrequently a concomitant with a few hours *light reading*. To those who now read nothing but light reading, and who are almost unaware of the pleasures of thinking, a few hours daily devoted to the study of Natural History would do them a world of good,—it would give them what, perhaps, they very much want at present—*an object of pursuit*.

The India Board have lately published certain "Regulations for the admission of Candidates for the appointment of Assistant-Surgeon in the Service of the East India Company." In these "Regulations" they announce that one of their objects in requiring examinations in Comparative Anatomy, Zoology and Botany, is "*to promote the study of Natural History as a most important adjunct or preliminary to a liberal medical education;* that of Comparative Anatomy, Zoology or Botany, if properly cultivated by means of specimens, for even a short period, *being eminently calculated to develope habits of close examination, and to strengthen those powers of reasoning upon observed facts*, which must be habitually exercised by medical men everywhere, but which must be exercised with the greatest energy and promptitude by those who practise in a tropical climate, and who are often thrown wholly upon their own resources."

This announcement we hail as one of the "signs of the times;" Natural History is to be studied for the mental training it induces, not merely taken up as an amusement.

THE PLEASURES OF ENTOMOLOGY.

(By the Editor.)

"He who can make two ears of corn grow where only one grew before, becomes a benefactor to his race," and this would be equally true were man devoid of intellect;—to feed the mind is a more noble employment than to feed the body, and he who can produce two ideas where only one previously existed has rendered good service. Now Entomology will furnish new ideas to many who are woefully in want of them.

Entomology is the study of insects; insects are living beings "fearfully and wonderfully made;" to be studied they must be collected and observed.

The pleasures of the collector of insects, even of the *mere collector*, are of a high order—compare them with the pleasures of the collector of coins, or the collector of autographs, &c.; the collector of insects, however he may enrich his collection by specimens received from others, will still make the larger part of his collection himself; most of the specimens will be his own captures, and the sight of them will remind him of the place of capture: the sloping down, with its short, slippery turf; the country lane, with its tangled hedges, where honeysuckle and bramble help to bind in friendly harmony the hazel, the dogwood and the oak; the sandy heath, where it was *so baking hot* in the sun, but where at evening the purple heather was perfectly swarming

with moths; the marshy swamp, where the reeds and typha helped to furnish a supply of *Wainscots;* the hollow in the oak wood, where the first *Purple Emperor* was seen, and, after many an hour's watching, was at length observed to descend to the margin of a muddy pool, and there caught; all these spots, and all the pleasurable sensations received at each of them, are they not written in the chronicles of our recollection? And are these not pleasures which belong to *us specially* as Entomologists, and which *the many* are unable to participate in?

Each time that the collector of insects catches some species which he has not before met with, he receives a thrill of pleasure, which it is very difficult to render intelligible to those who have not felt it; (those who are fond of music can have some conception of it from noticing their own sensations when they hear a beautiful air for the first time;) the number of species being so great, the pleasure is one of constant recurrence—occurring less frequently, it is true, as our collection advances towards completeness, but occurring in greater intensity in proportion as the sensation is more rarely experienced.

Yet, after all, these pleasures are but for ourselves and to ourselves; no one can share *our* pleasure in adding to *our* collection.

But the *observer* of insects enjoys pleasures of a far higher order; with him each new observation, even if communicated by another, produces a more intense thrill of delight than that experienced by the collector on adding some rarity to his collection—the discovery of some peculiarity in the habit of species long well known in our collections, but of which the habits had not previously been observed, this is an addition not to the collection of an individual, but to science, to the knowledge of created beings acquired by the human race; and in the present infant state of Entomology such

pleasures may be enjoyed many a time in the course of the year, and they will be more intense in proportion to the extent we can communicate them: here no room is left for selfishness, we add but to the common stock, and few will be disposed to be vain of the additions they may thus have made to the accumulated masses of knowledge about these atoms, when they reflect what a small fraction it is of the whole, and how less than nothing it appears when compared with the vast extent of the "terra incognita" of Entomology.

And these pleasures, it will be observed, though of so high an order, are positively within the reach of all; it has been well said "happiness is within our reach, if we will but take it."

Those who have once felt these pleasures know that there is an amount of enjoyment in them, which neither wealth nor rank can bestow; and they feel at the same time, that having learnt the secret of these pleasures, it would matter but little which of the usually-considered greater misfortunes befell them—no loss of property could prevent their enjoying these pleasures, because they are pleasures independent of property—no alienation of friends could disturb their happiness in these pleasures, because they are pleasures independent of friendship.

The pleasures of the *collector* are much mixed up with his collection, and if deprived of that, he might indeed be disposed to exclaim that the spoiler—

> "Robs me of that which not enriches him,
> And leaves me poor indeed."

Collections of insects are necessarily perishable; mould, mites, fire, &c., especially the two former, are often agents of destruction. But the process of re-making a collection is much less tedious than that by which the first collection was made—the experience acquired in making Collection

No. 1 is not subject to be destroyed either by mould, mites or fire, and will be found available for the formation of Collection No. 2.

The pleasures of the *observer* are independent of his collection, and therefore he is not liable to be deprived of them, and this is no slight addition to the enjoyment he derives from them.

But it must also be borne in mind, that it is no slight pleasure to find occupation and an object in every country walk. An Entomologist cannot say that—

> "A primrose by the river's brim
> A yellow primrose is to him,
> And it is nothing more."

A primrose conveys to his mind a reminiscence of all the insects that feed on it; he thinks of the fat larvæ which eat the leaves in winter and early spring, and for which he has oft perambulated his garden by night with a lantern; he thinks of the Dipterous miner that forms its mazy whitish track on the surface of the leaves—and not only has a primrise this importance to him, an importance which, without lessening its beauty as a flower, invests it in addition with other points of interest, but almost every plant and shrub becomes to him replete with pleasant recollections—a walk, even when he is not actually looking for insects, becomes a totally different thing from what the same walk would be to another person. But when we further consider that a walk is generally undertaken by the Entomologist with the express object of finding something, and it is rarely that he fails to succeed (if not in finding the very thing he was seeking for), at least of finding something which he is glad to meet with, we can comprehend that an Entomologist derives pleasure from every walk he takes.

And how many there are who would be thankful to learn

that secret of finding pleasure and actual enjoyment in every walk they take! they go out, it is true, for a walk, because their medical man recommends exercise in the open air, but the walk, for want of some object, is too often found—

"Weary, flat, stale and unprofitable."

Let them, if they wish to derive pleasure from every walk, learn to Entomologize. In Entomology, not only is there much to be done, but there is *so much that wants doing.* Like many a corn field last autumn, which was wanting to be cut till the labourers could be found, so is the Entomological crop ready for the sickle, but *where are the reapers?*

LIST OF BRITISH ENTOMOLOGISTS.

(By the Editor.)

Of late years the number of Entomologists has increased in a rapid ratio, and every year young Entomologists are produced from the mass of boy-butterfly-hunters, who never proceed further. But each young Entomologist pursues his occupation alone; perhaps he has some young friend of kindred tastes, they were at school together, but now are a hundred miles apart, and only meet once a year, at Christmas, perhaps not even then; EACH WORKS ALONE, yet are there scattered throughout the country many more experienced Entomologists, who would be very glad to assist beginners if they knew who were, in that capacity, in want of assistance. The incipients, however celebrated they may hereafter become, are at present unknown; consequently, before they can be assisted, they must make their existence known by applying by letter to some of their seniors.

Hence one great use of this list; each young beginner has but to look down the list to find some person who lives in his neighbourhood, and has an * prefixed to his name—to him he writes as follows:—

"Dear Sir,

"Understanding you are willing to assist Entomologists who are only beginners, I should be very glad if you could inform me * * * * * * * Could you oblige me with a sight of your collection, I fancy I might derive from it some useful hints.

"Believe me, dear Sir,

"Yours very truly."

But independently of this use of the list of Entomologists, it may also be extensively useful by enabling those who are far advanced beyond being mere beginners, to obtain some of those local species of which their collections are at present deficient. The Entomologist who lives in Sussex will never meet with *Erebia Blandina*, though he collect for fifty years; the Entomologist located in Argyllshire may be equally certain he will never there meet with *Limenitis Sibilla*. Now if the one collector meet with more *Sibilla* than he can use, he may as well give them away; and if the Argyllshire Entomologist meet with more *Blandina* than he wants, he will, in like manner, be no poorer from parting with what is a superfluity with him—yet each will be a gainer by the exchange.

By the word *exchange*, I do not mean that each obtains an exact equivalent for the hypothetical money value of the specimen parted with. A duplicate is something we do not want, its value to us is 0; if we attempt to bargain with a correspondent what he shall give us in return for our duplicate, we become hucksters and petty tradesmen. Many a young Entomologist, to my certain knowledge, thinks that by *exchanging* insects is meant parting with his duplicates for others of equal value; and therefore that in opening a correspondence by saying, "I have got so and so, what will you give in exchange for it," he is merely acting according to the customary practice of most of our distinguished Entomologists, but in this he labours under a great mistake—

"Freely ye have received, freely give;"

and he will find that the practice is to *give away* duplicates to others who may be in want of the respective species, without any stipulation with regard to exchanges.

Directly he begins to "drive a bargain," he gets a bad character, and "mercenary," "greedy," "stingy," are a few

of the epithets that get freely applied to him *behind his back*, and it damages a man's career for many years to get a bad character at first starting.

No one will find himself a loser by obtaining a character for liberality.

The following sample of a perfectly unconditional offer of duplicates, from the pages of the Zoologist (1855, Sept., p. 4816), may not be out of place here.

"*Duplicates of the Genus Colymbetes.* The water-net has produced duplicates of the following species of *Colymbetes;* I shall be much pleased to send them to any Entomologist as long as the store holds out; *C. oblongus, chalconotus, maculatus, vitreus, Sturmii, bipustulatus, ater, obscurus, angustior, fuliginosus, pulverosus, exoletus* and *bistriatus.* I shall be much obliged for specimens of the following species which do not appear to be metropolitan: *C. arcticus, fontinalis, congener, uliginosus, dispar, brunneus, notatus* and *adspersus.* I WISH IT TO BE DISTINCTLY UNDERSTOOD THAT MY OFFER TO DISTRIBUTE DUPLICATES IS QUITE UNCONDITIONAL, AND NOT IN ANY WAY DEPENDANT ON GIFTS I MAY RECEIVE. I hope this mode of advertising duplicates and desiderata will be followed by my readers; the pages of the 'Zoologist' are at their service, and there is no longer any duty on advertisements.—EDWARD NEWMAN."

The following list of British Entomologists cannot pretend to be a complete one. I have endeavoured to enumerate every Entomologist whose name and address I could learn, and who was willing to let his name figure in the list, but I have no doubt that I shall hear from many who may be disappointed at not seeing themselves in print in this Annual for 1856.

If each Entomologist, whose name is here omitted, will let

me know how he wishes his name to appear in the list in next year's Annual, I shall be most happy to accommodate him.

PERFECTION IS NEVER ATTAINED AT THE FIRST START.

List of British Entomologists.

Marked * are willing to assist young beginners, with specimens or information. (Note.—The absence of this mark does not necessarily imply that the unstarred Entomologist is a reserved, selfish animal,—some are too occupied to have any spare time to "tout" for correspondents, others are too young and feel incompetent to give information, others are in the decline of life, and have fairly earned their "*otium cum dignitate*," having in former years "done the state good service.")

*Adams, Arthur, F.L.S., Brook Cottage, Alverstoke, Hants. *Coleoptera, Hymenoptera* and *Myriapoda.*

Adams, Mrs. Arthur, Brook Cottage, Alverstoke, Hants. *British Coleoptera.*

Adams, Ernest, Esq., 17, Upper Gower Street, Bedford Square. *British Coleoptera* and *Lepidoptera.*

Adams, Henry, Esq., Hanover Villas, Notting Hill.

*Allis, T. H., Esq., York. *British Lepidoptera.*

*Almond, Mr. G. A., Oliver Street, Birkenhead. *British Lepidoptera.*

Ansell, Henry, Esq., Tottenham. *British Lepidoptera.*

*Armstrong, Thomas, Esq., 10, Barwise Court, English Street, Carlisle. *British Lepidoptera.*

*Ashworth, John S., Esq., Bryn Hyfryd, Llangollen, North Wales. *British Lepidoptera.*

*Austin, Mr. Henry, Jun., The Hollies, Little Ealing. *British Lepidoptera.*

Babington, C. C., Esq., M.A., F.R.S., F.L.S., F.G.S., St. John's College, Cambridge. *Coleoptera.* No longer collects; happy to give information.

BAIKIE, W. B., M.D., F.R.G.S., Haslar Hospital, Gosport. *Coleoptera, Myriapoda* and *Arachnida.*

BALDWIN, E. G., Esq., Albany House, Barnsbury Park. *British Lepidoptera.*

BALY, J. S., Esq., 13, Southampton Terrace, Kentish Town. *Exotic Chrysomelidæ* and *European Hymenoptera.*

BARLOW, F., Esq., Solicitor, Cambridge.

BARRON, CHARLES, Esq., Museum, Haslar, Gosport. *British Coleoptera, Hymenoptera* and *Lepidoptera.*

BARTON, Mr. STEPHEN, Quay Head Street, Bristol. *British* and *Foreign Coleoptera.*

*BATES, F., Esq., 5, Napier Terrace, Aylestone Road, Leicester. *British Coleoptera.*

*BEALE, S. C. TRESS, Esq., Ivy Court, Tenterden. *British Lepidoptera.*

BEDELL, G., Esq., 10, Gloucester Terrace, Gloucester Road, Bermondsey. *British Lepidoptera.*

*BELL, R. J., Esq., Reedness, Goole, Yorkshire. *British Lepidoptera.*

*BELL, THOMAS, Esq., F.R.S., Pres. L. S., F.G.S., 17, New Broad Street, London, and Selborne, Hants. *Crustacea.*

BIRKS, Rev. HENRY, B.A., Henley-on-Thames. *British Lepidoptera.*

BIRT, JACOB, Esq., 30, Sussex Gardens, Hyde Park, and Broomy Lodge, New Forest, Hants.

BLACKWALL, J., Esq., F.L.S., Hendre House, Llanrwst. *British Araneidea.*

BLADON, J., Esq., Pont-y-Pool. Happy to give information.

BLAKELEY, Mr. JOHN, 1, Water Street, New Town, Manchester. *British Lepidoptera.*

*BOLD, T. J., Esq., Angas Court, Bigg Market, Newcastle-on-Tyne. *British Coleoptera* and *Aculeate Hymenoptera.*

BOND, F., Esq., 24, Cavendish Road, St. John's Wood. *British Lepidoptera.*

*BOOTHMAN, W. Esq., 40, Plantation Street, Accrington, Lancashire. *British Lepidoptera.*

*BOSTOCK, G. J., Esq., Boteler House, Warrington. *British Lepidoptera.*

*BOYD, THOMAS, Esq., 17, Clapton Square. *British Lepidoptera.*

BRAIN, JOHN, Esq., Sleight's Bridge, near Whitby.

BREE, C. R., Esq., Stricklands, Stowmarket. *British Lepidoptera.*

BREE, Rev. W. T., Rectory, Allesley.

BREE, Rev. W., Polebrook, near Oundle, Northamptonshire. *British Lepidoptera.*

*Brewer, J. A., Esq., Holmesdale House, Reigate. *British Coleoptera.*

Brightwell, Thomas, Esq., F.L.S., Surrey Street, Norwich.

*Brockholes, J. F., Esq., 7, Egerton Terrace, Birkenhead. *British Lepidoptera.*

Brown, Edwin, Esq., Burton-on-Trent. *British Insects.*

Brown, John, Harrobin Mill, near Bolton. *British Lepidoptera.*

*Brown, Thomas, Esq., 13, King's Parade, Cambridge. *British Lepidoptera.*

Bull, E., Mansfield Road, Nottingham. *British Lepidoptera.*

Burnell, E. H., Esq., 32, Bedford Row, London.

*Burney, Rev. Henry, Wavendon, Bucks. *British Lepidoptera.*

*Buxton, E. C., Esq., Myddleton Hall, near Warrington. *British Lepidoptera.*

Carter, Mr. Samuel, 20, Lower Mosley Street, Manchester. *British Lepidoptera* and *Coleoptera*, and *Foreign Coleoptera.*

Christie, Arthur, Esq., 9, Stanhope Street, Hyde Park Gardens.

Clark, Rev. Hamlet, M.A., Northampton. *British Coleoptera.*

Clarke, A. H., Esq., Walmer House, Kensington Park, Notting Hill.

Clarke, J. and H. B., Low Pavement, Nottingham. *British Coleoptera* and *Lepidoptera.*

Clifford, Mr. J. R. S., 21, Queen's Row, Pimlico. *British Lepidoptera.*

Colquhoun, Hugh, Esq., M.D., 3, Kew Terrace, Glasgow. *British Lepidoptera.*

*Cooke, Henry, Esq., 8, Pelham Terrace, Brighton. *British Lepidoptera.*

Cooper, Mr. James, Museum, Warrington. *British Lepidoptera.*

Cox, Captain C. J., Q.G., Fordwich House, Fordwich, Kent. *Lepidoptera.*

Crewe, H. Harpur, Esq., Breadsall Rectory, near Derby. *British Lepidoptera.*

Curtis, John, Esq., F.L.S., 18, Belitha Villas, Barnsbury Park, London. *British Insects of all orders.*

Dale, J. C., Esq., F.L.S., Glanville's Wootton, near Sherborne, Dorset. *British Insects.*

Dale, W. C., Esq., St. Pancras' Vicarage, Gordon Square. *British Lepidoptera.*

*Dallas, W. S., Esq., F.L.S., 23, Crane Grove, Holloway Road. *Hemiptera.*

Davis, Mr. Edwin, Jun., 8, Victoria Place, Stapleton Road. *British Lepidoptera.*

Dawson, John, Esq., Carron, near Falkirk, Stirlingshire. *British Lepidoptera.*

Dawson, Rev. J. F., LL.B., the Woodlands, near Bedford. *British Coleoptera.*

De La Chaumette, Henry, Esq., 9, Gloucester Terrace, West Green Road, Tottenham. *All European Insects.*

Denny, Henry, Esq., A.L.S., Philosophical Hall, Leeds. *Anoplura* and *Pselaphidæ*. Is now working at Exotic *Anoplura.*

Desvignes, Thomas, Esq., Fir Tree Cottage, Woodford. *Coleoptera, Lepidoptera* and *Hymenoptera*, especially *Ichneumonidæ.*

*Dossetor, T. P., Esq., 13, Poultry. *British Coleoptera* and *Lepidoptera.*

*Doubleday, Henry, Esq., Epping. *British Lepidoptera.* The finest Collection in England.

*Douglas, J. W., Esq., 6, Kingswood Place, Lee, Kent. *British Lepidoptera* and *Coleoptera.* At home to Entomologists every Friday Evening after half-past six, P.M., from November to March inclusive.

*Downie, Mr. R., Barnet, Herts. *Observer of Bees.*

*Drane, Robert, Guestwick, Foulsham, Norfolk.

*Duncalfe, Henry, Esq., West Bromwich. *British Lepidoptera.*

*Duncan, Mr. John P., Monkton, Ayrshire. *British Lepidoptera* and *Coleoptera.*

Dunning, J. W., Esq., Elmwood Lodge, Leeds, and Trinity College, Cambridge. *British Lepidoptera.*

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*Dutton, James, Esq., 2, Theresa Place, Hammersmith. *British Lepidoptera.*

*Edleston, R. S., Esq., 5, Meal Street, Manchester, and Bowdon, Cheshire. *British Lepidoptera.*

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FRASER, FINLEY, Innkeeper, Bolton. *British Lepidoptera.*

FREASON, G., Ison Green, near Nottingham. *British Lepidoptera.*

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GARNEYS, CHARLES, Esq., Bungay, Suffolk. *British Lepidoptera* and *Coleoptera.*

GARNEYS, W., Esq., Bungay, Suffolk. *British Lepidoptera* and *Coleoptera.*

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GAVILLER, AUGUSTINE, Esq., Loudwater, Wycombe, Bucks. *British Lepidoptera.*

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GRANT, FREDERICK, Esq., Putney. *British Coleoptera.*

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*GRAY, J. E., Esq., Ph. D., F.R.S., Pr. B. S., V.P.Z.S., &c., British Museum.

*GREENE, Rev. JOSEPH, Brandeston, Woodbridge, Suffolk. *British Lepidoptera.*

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*GREGSON, WILLIAM, Esq., Lytham. *British Lepidoptera.*

*GROVES, W., Esq., 12, Morden Place, Lewisham Road. *British Lepidoptera* and *Coleoptera.*

*GRUT, F., Esq., 9, King Street, Southwark. *British Coleoptera* and *Lepidoptera.*

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HAGUE, Mr. THOMAS, Dog and Partridge Inn, Staleybridge. *British Lepidoptera.*

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*HARDING, Mr. H. J., York Street, Church Street, Shoreditch. *British Lepidoptera, Coleoptera, &c. Collects Insects for sale; also purchases Insects.*

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*HAWKER, Rev. W. H., Horndean, Hants. *British Lepidoptera.*

*HEMMINGS, Mr. J., 2, Bedford Buildings, Brighton. *British Lepidoptera.*

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*HODGKINSON, Mr. J. B., 11, St. Peter's Square, Preston. *British Lepidoptera.*

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*HUDSON, Mr. F. T., 19, Stockwell Street, Greenwich. *British Lepidoptera.*

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JORDAN, C. J. R., Esq., Teignmouth, Devon. *British Lepidoptera.*

JORDAN, Dr., Birmingham. *British Lepidoptera.*

*KERSHAW, Mr. JOHN, Newtown, Altringham, Cheshire. *British Insects.*

KEETLEY, S., 24, Carter Gate, Nottingham. *British Lepidoptera.*

KING, Mr. GEORGE, Norwich Road, Ipswich. *British Coleoptera* and *Lepidoptera.*

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*Lowe, W. F., Esq., M.D., Balgreen, Slateford, near Edinburgh. *British Lepidoptera* and *Coleoptera.*

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M'Keand, Robert, Esq., The Grove, Lowton, near Warrington. *British Lepidoptera.*

*Marshall, Thomas, Esq., Trinity Cottage, Leicester. *British Insects of all orders.*

*Meade, R. H., Esq., Bradford, Yorkshire. *British Arachnida.*

Melhuish, G. E., Esq., Upper Tooting, Surrey. *British Lepidoptera.*

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*Morley, Mr. John, Duke Street, New Basford, near Nottingham. *British Lepidoptera.*

Morley, W., Cross Street, New Basford, near Nottingham. *British Lepidoptera.*

*Morris, Beverley, R., Esq., M.D., 38, Fawcett Street, Bishopwearmouth, Durham. *Coleoptera.*

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*Moses, Henry, Esq., M.D., Appleby, Westmoreland. *British Insects of all orders.*

*Murray, A., Esq., 1, Scotland Street, Edinburgh. *Coleoptera, both British and Exotic.*

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*Newman, Edward, Esq., F.L.S., 7, York Grove, Peckham.

Newnham, P. H., Esq., Farnham, Surrey. *British Lepidoptera.*

Nicoles, S., Coldham Street, Nottingham. *British Lepidoptera.*

Norman, Alfred Merle, Esq., Christchurch, Oxford.

Norman, Mr. J. T., 10, Fountain Place, City Road.

*Parfitt, Mr. Edward, 4, Weirfield Place, St. Leonard's, Exeter. *British Lepidoptera, Coleoptera* and *Hymenoptera.*

Parry, Captain F. J. S., F.L.S., 5, Terrace, Worthing, Sussex. *Exotic Coleoptera.*

*Pascoe, F. P., Esq., F.L.S., Fern Lodge, Kensington. *Coleoptera, Lamellicornes and Longicornes of the whole world.*

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*Plant, Francis, Esq., Hastings Street, Leicester. *British Coleoptera.*

Plint, Henry, Esq., 52, Castle Street, Liverpool. *British Lepidoptera.*

Porter, Thomas, Stott Hillock, Bolton. *British Lepidoptera.*

*Power, John A., Esq., M.D., 52, Burton Crescent. *British Coleoptera.*

Preston, Rev. J. D. J., Askam Bryan, York.

Preston, T. A., Esq., Emmanuel College, Cambridge. *British Lepidoptera.*

Price, Samuel, Esq., 44, Bell Barn Road, Birmingham. *British Lepidoptera.*

Reading, J. J., Esq., 5, Union Street, Plymouth. *British Lepidoptera* and *Coleoptera.*

REID, Mr. HUGH, 8, Spring Gardens, Doncaster. *British Lepidoptera.*

RILEY, S. H., Kingston Street, Nottingham. *British Lepidoptera.*

RILEY, T., Barker Gate, Nottingham. *British Lepidoptera.*

*RIX, J. L., Bongate, Appleby, Westmoreland. *British Insects of all orders.*

ROBINSON, Mr. H., 12, Porter Street, Preston. *British Lepidoptera.*

ROBINSON, Mr. W., 12, Porter Street, Preston. *British Lepidoptera.*

ROSE, W. B., Mansfield Road, Nottingham. *British Coleoptera* and *Lepidoptera.*

*SALT, G. M., Esq., Shrewsbury. *British Lepidoptera.*

SALVIN, O., Esq., Trinity Hall, Cambridge. *British Lepidoptera.*

*SANG, Mr. JOHN, High Row, Darlington. *British Lepidoptera.*

SAUNDERS, W. W., Esq., F.R.S., F.L.S. *All Insects from all parts of the globe.*

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*SELBY, P. J., Esq., Twizell House, Belford, Northumberland. *British Insects.*

SHEPHERD, EDWIN, Esq., 176, Fleet Street. *Lepidoptera.*

*SHEPPARD, A. F., Esq., Rutland House, Kingston-on-Thames. *British Lepidoptera* and *Coleoptera.*

*SHEPPARD, EDWARD, Esq., 5, Ladbroke Place West, Notting Hill. *British* and *Exotic Coleoptera.*

SHEPPARD, Major E., F.L.S., Rutland House, Kingston-on-Thames. *British Lepidoptera.*

*SHIELD, Mr. RICHARD, 7, Mansfield Place, Kentish Town. *British Lepidoptera.*

SLATER, R., Mansfield Road, Nottingham. *British Lepidoptera.*

*SMITH, Rev. BERNARD, M.A., Marlow, Bucks. *British Lepidoptera.*

*SMITH, FREDERICK, Esq., British Museum. *Hymenoptera* and *Coleoptera.*

*SMITH, W. P., Esq., High Street, Carnarvon. *British Coleoptera.*

SPENCE, WILLIAM, Esq., F.R.S., F.L.S., 18, Lower Seymour Street, Portman Square.

SPENCER, W., Park Street, Nottingham. *British Lepidoptera.*

SPRAGUE, T. B., Esq., B.A., Fellow of St. John's College, Cambridge.

STAFFORD, Jos., Coal Pit Lane, Nottingham. *British Lepidoptera.*

*Stainton, H. T., Esq., Mountsfield, Lewisham. *European Lepidoptera and the Tineina of the whole world.* At home to Entomologists every Wednesday evening after 6, p.m.

Standish, Mr. Benjamin, 12, Acorn Street, Southampton Street, Camberwell. *British Lepidoptera.*

Standish, Mr. Joseph, 5, Richmond Terrace, Clapham Road. *British Lepidoptera.*

*Stevens, Samuel, Esq., F.L.S., 24, Bloomsbury Street. *British Lepidoptera* and *Coleoptera.*

Stretch, R. H., Esq., Parson's Street, Banbury. *British Lepidoptera.*

Syme, John T., Esq., 11, Gower Street, Bedford Square, London. *Coleoptera.*

Tearle, Rev. F., Trinity Hall, Cambridge. *British Lepidoptera.*

Tebbs, H. V., Jun., Esq., Southwood Hall, Highgate. *British Lepidoptera.*

Thompson, Miss S., Barn Hill, Stamford.

*Thompson, Mr. William, 6, Lawrence Street, Crewe, Cheshire. *British Lepidoptera.*

Thomson, William, Esq., F.L.S., 11, Dartmouth Villas, Forest Hill, Sydenham.

*Thorncroft, Mr. Thomas, 87, North Lane, Brighton. *British Lepidoptera.*

Thurnell, Mr. Charles, Newton, Cambridgeshire.

Tompkins, H., Esq., 90, Guildford Street, Russell Square. *British Lepidoptera.*

Tompkins, J. C., Esq., 54, Bernard Street, Russell Square. *British Lepidoptera.*

Turnbull, R. F., Esq., Ramsgate. *British Lepidoptera.*

Turner, J. Aspinall, Esq., Cross Street, Manchester. *Foreign Coleoptera, especially African species.*

*Tweedy, William, Jun., Esq., Truro-Vean, Truro. *British Lepidoptera.*

Unwin, W. C., St. Ann's, Lewes. *British Hymenoptera—Aculeata.*

*Vaughan, P. H., Esq., Redland, near Bristol. *British Lepidoptera.*

*Walcott, W. H. L., Esq., 11, Vyvyan Terrace, Clifton. *British Hymenoptera.*

WALTON, JOHN, Esq., F.L.S., Byard's Lodge, Knaresborough. *British Coleoptera, principally Curculionidæ.*

WARING, S. L., Esq., Norwood. *British Lepidoptera.*

WARRINGTON, JOHN, Esq., Tranmere Hall, near Birkenhead. *British Lepidoptera.*

WATERHOUSE, G. R., Esq., F.Z.S., British Museum. *Coleoptera.*

WEAVER, Mr. RICHARD, 25, Pershore Street, Birmingham. *British Insects of all orders. Specimens always on sale or exchange.*

*WEIR, J. JENNER, Esq., 20, Maismore Square, Old Kent Road. *British Lepidoptera.*

*WESTWOOD, J. O., Esq., F.L.S., St. Peter's, Hammersmith. *Economic Entomology and Insects of all orders from all parts of the globe, especially if of peculiar forms.*

WHITE, ADAM, Esq., Assist. Zool. Dept., British Museum.

WILD, W. J., Esq., Herne Hill, Camberwell. *British Lepidoptera.*

*WILKINSON, S. J., Esq., 7, Jeffrey's Square, St. Mary Axe, London. *British Lepidoptera.*

*WILKINSON, Mr. T., 6, Cliff Bridge Terrace, Scarborough. *British Lepidoptera.*

*WILSON, Mr. JAMES, Zeta Court, William Street, Botchergate, Carlisle. *British Lepidoptera.*

*WINTER, JOHN N., Esq., Sussex County Hospital, Brighton. *British Lepidoptera.*

WOOD, Mr. HENRY, Danesfield Gardens, Marlow. *British Lepidoptera.*

WOLLASTON, T. V., Esq., M.A., F.L.S., 25, Thurloe Square, Brompton. *Coleoptera.* (At present in Madeira.)

YUILL, Rev. JAMES, Peterhead, N.B.

POSTSCRIPT.

MACLAURIN, Rev. ROBERT, Greenfield Cottage, Lerwick, Shetland.

Any Entomologist who finds his name omitted in the above list is requested to intimate the same to me on or before October 1st, 1856.

H. T. S.

LEPIDOPTERA.

(By the Editor.)

NEW BRITISH SPECIES IN 1855.

As if in direct defiance of the assertion in "Glaucus," that "our home Entomologists are spending their time now, perforce, in verifying a few obscure species, and bemoaning themselves, like Alexander, that there are no more worlds left to conquer," our list of novelties in this order is rather a startling one.

Two new *Sphinges* (and we were told last January that we should not get *a* new *Sphinx every year*), or it may be more correct to call one of them an old *Sphinx* revived; a new *Noctua*, congeneric with the *angle-shades*, and nearly as large; two new *Geometræ*, which we cannot possibly suspect to have been smuggled over from the Continent, as they seem to be great rarities there; a new *Pyralis;* a new *Chilo*, of which it is true I saw a specimen the previous year, but my *dictum* was it was probably American—now it is turning up not only here but in Germany, so wherever it may have emigrated from, it appears determined to make good a settlement; three new *Tortrices*, several new *Tineina* and two new *Plumes*.

Trochilium scoliæforme.
chrysidiforme.
Phlogophora empyrea.
Dosithea eburnata.
circuitaria.
Botys decrepitalis.
Chilo obtusellus.
Mixodia Hawkerana.
Retinia duplana.
Argyrolepia maritimana.
Cleodora striatella.
Coleophora squamosella.
siccifolia.
Asychna profugella.
Elachista flavicomella.
Lithocolletis Bremiella.
Nepticula cryptella.
betulicola.
continuella.
Alnetella.
Pterophorus Zetterstedtii.
plagiodactylus.

This has been a grand year for Lepidopterists: the hard winter and backward spring retarding the larvæ from leaving their winter quarters till the season was sufficiently advanced to enable vegetation, when it did begin to grow, to continue without check, has rendered this, I believe, without exception the best year for LEPIDOPTERA in the memory of the oldest Entomologist. 1846 was a grand year with *Antiopa* and *Convolvuli*, but there was not that general profusion of such multitudes of species that has been observed in the year 1855.

TROCHILIUM SCOLIÆFORME, Borkhausen. A large species, allied to *Sphegiforme* and *Allantiforme*, resembles the former in having (at least in one sex) a portion of the antennæ, towards the tip, whitish. From *Sphegiforme* it may be instantaneously distinguished by the anal tuft of the abdomen being *bright saffron* (reddish-orange), whereas in *Sphegiforme* it is entirely black. *Allantiforme* has the central portion of the anal tuft yellow, only the sides of it black.

Expands 1 inch 3 lines. Anterior wings with the costa and hind margin blueish-black; the central fascia broad, blueish-black, with a wedge-shaped projection towards the base; thorax black, with two lateral oblique yellow lines; abdomen blueish-black, with two yellow rings, anal tuft saffron.

This conspicuous addition to our Fauna (which we hope to figure on the plate of our next year's Annual) was taken by Mr. Ashworth, in Wales, and its capture is recorded in the Zoologist, p. 4814, under the name of *Trochilium Sphegiforme*.

The larva has been found by Dr. Staudinger feeding within the wood of the birch.

TROCHILIUM CHRYSIDIFORME. (*Frontispiece*, Fig. 1.)

Distinguished at a glance from our other species of the genus by the deep orange scales along the inner margin, and round the edges of the apical hyaline spot, and by the post-medial black fascia not reaching to the inner margin, but stopping short when rather more than half across the wing. The central part of the anal tuft is deep orange yellow, the sides black. The abdomen (of the specimen before me) is black, with two slender whitish rings; but it would appear from Herrich-Schäffer's remarks, that the number of pale rings is variable. It most resembles our *Ichneumoniforme*, but by the characters above mentioned may be at once distinguished from that species.

The specimen figured was taken on the 25th of June last, and its adventures were rather romantic.

It so happens that the directors of the South-Eastern Railway had resolved to treat the denizens of Reigate, on that day, with an excursion train to Dover; Reigate is a healthy neighbourhood, but still a few hours by the sea-side might be a treat to the inhabitants, and accordingly many of the in-dwellers and out-dwellers of Reigate committed themselves to the safe custody of the South-Eastern Railway, and were in due time transported to Dover. Now at Reigate there lives a Coleopterist of the name of Brewer. Mr. Brewer was one of those who profited by the excursion train to Dover. No doubt he amused himself as the train wended along past Tunbridge, Staplehurst and Ashford, with conjectures of the rare coast beetles he was then about to meet with. But it was not by any Coleopterous insect that that day's excursion was to be immortalized. Sweeping the herbage on the undercliff between Dover and Folkestone, he obtained a transparent-winged moth, and not being learned in Lepidopterology, it struck him as curious. Now a Coleop-

terist carries no boxes, he carries only a phial with bruised laurel leaves, and in this already sundry *Harpalidæ* and *Staphylinidæ* were wriggling their legs. Man is an inventive animal; when at a loss for a word he coins one, when at a loss for an implement he uses something not originally destined for that purpose. Happily for my present subject, Mr. Brewer was a smoker of tobacco, and carried a fusee-box; the clear-winged moth was placed as a curiosity in the fusee-box and carried home.

Now it so happened, that at this time, Mr. Douglas had made out a visit for some days to Mickleham, and being there went over to Reigate to see Mr. Brewer. The conversation, of course, ran principally upon *Coleoptera*, but Mr. Brewer, aware that his Lee correspondent was also a devoted adherent of Lepidopterology, placed the fusee-box in his hand, inquiring if *that* was *of any use to him*, and so *Trochilium Chrysidiforme* gladdened the eyes of a Lepidopterist!

From that time the insect found itself duly honoured; it had a special label attached to it, indicating its pedigree, and was exhibited at the Meeting of the Entomological Society of London, where it created a sensation.

The insect is *not new to Britain*, but its authenticity as British had been much questioned, and the name had been erased from Mr. Doubleday's Catalogue, and from Mr. Stephens's Museum Catalogue of British Lepidoptera.

It was originally taken by Mr. Francillon in a thick grove, and this specimen, recorded by Haworth, is in the collection of Mr. Edwin Shepherd; Mr. Curtis has also a specimen taken by Mr. Leplastrier, near Dover.

Mr. Barron, in the Zoologist, 1851, p. 3289, records the capture of a specimen, in August, 1851, near Haslar Hospital.

Mr. E. Brown, of Burton-on-Trent, has "had a specimen in his collection for several years, from Lancashire."

Its home appears to be in the South of Europe, but Herrich-Schäffer states that it occurs on the Rhine; and from Pierret's observations, it is sometimes found in the neighbourhood of Paris, frequenting dry places the middle of June, and reposing on *Umbelliferæ*.

The food of the larva is unknown.

PHLOGOPHORA EMPYREA, Hübner. (*Frontispiece*, Fig. 2.)

A very distinct species—with very little resemblance to any other *Noctua* * with which I am acquainted. The pale ochreous reniform stigma, with a pointed projection from its lower half towards the base, standing out conspicuously on the purplish brown anterior wings, and the pale inner margin of the latter, furnish characters by which the insect may be immediately recognised.

Treitschke gives Italy as the *fatherland* of this very rare species; Duponchel announces its capture in the South of France; Guenée adds to these localities central France; the latter Entomologist has frequently bred the insect, which always appears between the middle of September and beginning of October. The larva is polyphagous, feeding on various low plants.

Mr. Winter has this year met with this species at Brighton; a locality of considerable Entomological importance, as in the neighbourhood of Brighton and Lewes more species of our Butterflies occur than in other localities. A few years ago *Chœrocampa Nerii*, a truly Italian species, was also taken here, and *Glœa erythrocephala*, taken near Brighton, still remains unique in Mr. H. Cooke's collection.

Of *Phlogophora empyrea* several specimens were taken at sugar, by Mr. Winter and Mr. Eagles. The wings when in repose are not folded as in *P. meticulosa*.

* Unless it be a large *Euplexia lucipara*.

DOSITHEA EBURNATA, Wocke. (*Frontispiece*, Fig. 4.)

A very pretty little distinct species, something like a small *Immutaria*, but paler and more distinctly marked, and the middle striga *precedes* the central spot.

Expands 10 lines. Anterior wings pale greyish, with three wavy dark fuscous strigæ, broadest on the costa; the second striga just *anterior* to the central black spot; beyond the third striga is a waved interrupted fuscous fascia, and a fuscous cloud on the hinder margin. Posterior wings pale greyish, with no basal striga, but with one in the middle preceding the central black spot, and a hinder one followed by a cloudy interrupted fascia. A row of fuscous dots along all the hinder margins; cilia pale yellowish.

I entertain very little doubt but that this is the *Contiguaria* of Herrich-Schäffer, who gives as a synonym Hübner's figure 105, but with the remark "I never saw it so large"—in which observation I perfectly agree, so that Hübner may have represented some species which has not yet been re-discovered, I have therefore adopted the name under which Wocke gave this insect in the Breslau "Zeitschrift für Entomologie," Lepidoptera, p. 48, pl. 4, fig. 13.

Herrich-Schäffer says, that it "occurs in July, in the North of France and North of Germany."

The specimen I have before me is one of several taken by Mr. Weaver in Wales last summer.

DOSITHEA CIRCUITARIA, Hübner.

No good figure of this exists, but the specimen I have before me was not sufficiently fine to render its portraiture advisable. It is not closely allied to any of our known species; size of *Virgularia*, with the ground colour of *Perochraria*, or rather more reddish than that.

Expands 8 lines. Dark ochreous, clouded with rusty, a central black spot on each wing. Anterior wings with two

transverse dusky strigæ slightly indented, one before, the other beyond the middle, and a dark wavy fascia towards the hinder margin; the latter fascia is the only one distinctly represented on the posterior wings; cilia ochreous, with a row of dark fuscous spots.

The specimen described was taken by Mr. Hunter, *in London*, and I am informed that Mr. Bond and Mr. A. F. Sheppard have also specimens of this species.

Duponchel states, that the species occurs in June, among oaks.

Botys decrepitalis, Fischer v. R. (H. S., IV., 40, Pyral. pl. x., fig. 67, 68.)

Not closely allied to any of our known species; perhaps most like a faded, indistinctly marked *Etialis*, but not so white as that insect.

Expands 11 lines. Anterior wings pale greyish-white, with a faint indication of the hinder striga, which is not indented towards the base after leaving the costa; the central dark spots are very indistinct; along the tip of the costa and hinder margin are several distinct dark brown spots. Posterior wings whitish, with a central dark spot, a slender hinder striga and a pale fuscous cloud immediately before the hind margin, on which latter are several dark brown spots.

Described from a female specimen taken by Mr. Hodgkinson.

Mr. Buxton took a male insect (expanding 12 lines), which may, perhaps, be referable to this species, but the ground colour is darker, and all the markings indistinct, even the marginal dark spots are hardly developed.

On the continent this occurs in the Alps, from June to August.

CHILO OBTUSELLUS, n. sp. (*Frontispiece*, Fig. 5.)

By the extremely obtuse anterior wings, and pure white posterior wings distinguished from all other species of the genus *Chilo*.

Expands 14—16 lines. Anterior wings very pale brownish-ochreous, with two small dark fuscous spots on the medial nervure, between the base and the middle of the wing; a third spot is placed beyond the middle rather nearer the costa; towards the hinder margin is a row of small dark fuscous spots placed rather obliquely; in some specimens there is an additional spot on the fold near the base; *the hinder margin of the anterior wings is unusually straight*, with a slight elbow towards the anal angle; cilia unicolorous with the wings, or a little darker. Posterior wings pure white, with a dark fuscous marginal line at the outer angle; cilia white.

The specimen of this insect, shown me last year, was taken by Mr. Buxton, at Horning Fen; this year other specimens have been taken in the same locality by Mr. George King, whom Mr. Buxton employed to look out for the novelty.

It flies in July; no doubt the larvæ and pupæ might be collected in the stems of some aquatic plant.

This insect differs from *C. Cicatricellus* in the form of the hind margin of the anterior wings, and by the absence of the ocellated spots along the subcostal nervure.

MIXODIA HAWKERANA, Stevens, n. sp.

Somewhat resembles *M. tenerana* (*Ratzburghiana*), but paler, the dark fascia more oblique, and the space preceding it on the inner margin not paler than the ground colour of the wing; it has some superficial resemblance with *Catoptria modestana*, but it is much darker and more reddish, and with no distinct ocellus towards the hinder margin of the anterior wings; the posterior wings also are much darker.

Expands 6½ lines. Head pale reddish ochreous. Anterior wings pale reddish ochreous; the base fuscous, bordered by an angulated dark fuscous striga before the middle; beyond the middle is an oblique irregular fuscous fascia, terminating in the anal angle; along the costa are numerous short dark fuscous streaks, and the hinder margin is edged with dark fuscous; cilia blackish. Posterior wings dark-greyish fuscous, with paler cilia.

Taken by Mr. S. Stevens and the Rev. W. H. Hawker, in September last, on Hayling Island, Hants, among the spurge which grows on the coast.

Retinia duplana, Hübner.

Like a small dark *Turionella;* but the *thorax grey,* only the head and palpi ferruginous.

Expands 7—8 lines. Head and palpi ferruginous; thorax grey. Anterior wings grey, with darker transverse wavy bands, the entire apical portion suffused with ferruginous, the apex rather acute, much more so than in the allied species. Posterior wings grey.

Bred last summer by Mr. Scott from a bud of Scotch fir.

A few specimens were also taken by Mr. Bouchard, in Scotland.

Ratzeburg's figure does not represent the anterior wings sufficiently pointed, but Herrich-Schäffer especially calls attention to this character of the insect.

Argyrolepia maritimana, Guenée.

Most nearly allied to *A. Dubrisana,* but larger, and the anterior wings yellower; and also readily distinguished from that species by the greyish posterior wings being mottled with white.

Expands ♂ 8, ♀ 8½ lines. Anterior wings *yellowish* straw-colour, marbled with fuscous or blackish, with an ill-de-

fined dark fascia before the middle, and dark rather triangular spot at the anal angle; two dark spots on the costa before the apex are very distinct; cilia pale yellowish, varied with fuscous. Posterior wings greyish, darkest towards the hinder margin, *mottled with white;* cilia whitish. The female is larger and *paler* than the male.

The addition of this new species to our Fauna was the reward of Mr. Harding's perseverance; he having detected the larva in the summer of 1854 (see Enigma No. 14, Ent. Annual, 1855, 1st Edition, p. 63; 2nd Edition, p. 86), and systematically followed up his problem to solution.

Mr. Harding has furnished me with the following interesting notes of the habits of the insect:—"The moths make their appearance the end of May and beginning of June. The males are much more rare than the females, but both are very local and far from common. They rest on the lower leaves of the *Eryngium maritimum*, the plant on which the larva feeds, or on the sand under the plant; when disturbed, their flight is short, seldom more than three or four yards, alighting on the sand, or on some neighbouring plant of *Eryngium*. The female deposits her eggs on the top or heart of the plant—seldom more than one in a plant; the larvæ are hatched in about twelve or fourteen days, and begin to work down the stem to the first joint, where they open a hole to work out their excrement; then work down again to the next joint, where they make a hole as at the first joint. Finally, they work down the stem to the root, where they change to a red-brown pupa in autumn (I believe in the autumn, but am not quite certain when the change takes place); the pupa works up the dead stem of the plant to the top in May, and then the perfect insect makes its escape. They remain in the imago state for about three weeks."

The larva is yellowish white, with black spots.

Mr. Harding met with this species, on the coast near Deal.

CLEODORA STRIATELLA, W. V. (*Frontispiece*, Fig. 6.)

Alis anticis griseis, lineis duabus albis, una plicæ, altera disci (punctis pone medium nigris), strigulis costæ apicis tribus albis. Exp. al. 5—6 lin.

Head and face greyish white; palpi whitish, tip of terminal joint dark fuscous; antennæ dark fuscous. Anterior wings grey, a slender white streak runs from the base along the fold; in it in the middle is an elongate black spot; above it is a less distinct white streak, with an elongate black spot a little beyond the middle, and half-way between that and the hinder margin is a round black spot; towards the apex an oblique white streak runs from the costa to above the anal angle, and immediately before the apex are two short white streaks from the costa sloping inwards; on the inner margin, near the anal angle, are two or three short white streaks; a black line runs along the hinder margin; cilia grey, with two dark fuscous lines. Posterior wings grey, with greyish fuscous cilia.

From the different ground-colour and basal streaks this is at once distinguished from our only other British species of the genus, *Cytisella*. It, however, very nearly resembles an Italian species *Kefersteinella*, but in that the broader anterior wings are more brownish, and the basal white streaks are absent.

I have a specimen of this species; it came to my light on the evening of the 11th of August last. I am not now in the habit of lighting my attracting lamp, but on that evening so many moths came tapping at the windows of the room in which I was sitting, that I resolved upon "lighting up," and about half an hour afterwards the *Striatella* made its appearance.

On the continent the insect is common, and the larva feeds in the stem of the Tansy (*Tanacetum vulgare*); hence we are led to infer that the larva of *Cleodora Cytisella*, which

species is always found amongst fern (*Pteris aquilina*), *may feed* in the stems of that plant.

COLEOPHORA SQUAMOSELLA, n. sp.

Alis anticis griseo-fuscis, costa ante medium anguste alba, squamis sparsis disci albis; antennis albis, saturate-fusco-annulatis; articulo basali non penicillato. Exp. al. $5\frac{1}{2}$—$6\frac{1}{2}$ lin.

Head, face and palpi grey. Antennæ white, sharply annulated with dark fuscous. Anterior wings greyish fuscous, with the costa narrowly white to the middle; along the fold and towards the hinder margin are numerous irregularly scattered white scales, which give the insect a peculiarly rough appearance; cilia pale greyish. Posterior wings grey, with paler cilia.

Not closely allied to any known species; most easily recognized by the scattered white scales on the dark ground of the anterior wings.

Two specimens have been taken by Mr. Douglas, in Headley Lane, near Mickleham, August 10th, 1851, and August 18th, 1853.

COLEOPHORA SICCIFOLIA, n. sp.

Alis anticis nitidis, griseis; antennis albis, fusco-annulatis, basim versus ochraceo-tinctis; articulo basali non penicillato. Exp. al. 6 lin.

Head, face and palpi greyish ochreous. Antennæ white, annulated with fuscous, towards the base with a pale ochreous tinge. Anterior wings unicolorous grey, very glossy, sometimes with a slight ochreous tinge; cilia greyish fuscous. Posterior wings grey, with greyish fuscous cilia.

Most closely allied to *C. gryphipennella*, but distinguished by the less sharply annulated antennæ and the more glossy, narrower anterior wings; from *C. viminetella* it is distin-

guished by the stouter antennæ (the extreme slenderness of which in *Viminetella* is one of the peculiarities of that species), and likewise by the more glossy, and rather broader anterior wings.

This insect is the solution of Enigma No. 4 (Entomologist's Annual, 1855, 1st Edition, p. 62; 2nd Edition, p. 85). These larva, which from their ill-made cases received the *sobriquet* of the "clumsy-tailor," were first noticed feeding on hawthorn in 1852. For two years we tried in vain to rear it; nothing daunted, the larvæ were again diligently collected in 1854, and kept *out of doors* during the winter and spring, and we have now bred several specimens of this new species. The larvæ feed in July and August on hawthorn and wild apple, causing peculiarly brown blotches; the cases are very singular constructions, they are far larger than is necessary for the habitation of the larvæ, and are formed of pieces of mined leaf, the large superfluous piece overlapping, and have quite the appearance of peripatetic dried leaves. Those who conceived that it was necessary to go to India to see "Walking-Leaf Insects" were in error, for this larva and case is a more curious *walking-leaf insect* than any we import from abroad, and in many places it abounds.

The specimens bred made their appearance from the middle to the end of June.

ASYCHNA PROFUGELLA, Zeller, n. sp.

Alis anticis latiusculis, obscure griseo-æneis, parum fuscotinctis; posticis saturate griseis. Exp. al. 4 lin.

Head, face and palpi greyish fuscous; antennæ fuscous, towards the tip whitish. Anterior wings dull greyish-bronze, more or less tinged with fuscous, the cilia a little paler. Posterior wings dark grey, with paler cilia.

All the wings comparatively broad, much more so than in *A. fuscociliella*, and without the glossy greenish appearance of that species.

This insect is one of doubtful location, perhaps forming the type of a new genus allied to *Perittia;* for convenience of reference I temporarily place it in that refuge for the destitute-*Asychna.*

Mr. Winter took a fine specimen at Woodlands Mann, Kemsing, Kent, in the third week in July, flying in the sun on a chalky bank, clothed with a variety of vegetation, amongst which *Origanum vulgare* and *Helianthemum vulgare* abounded. He looked in vain for more specimens. A specimen has been in Mr. Douglas's collection for some time, but its locality is unknown. The only other specimen I have seen is in the collection of Professor Zeller; it was taken at Hermsdorf, in July.

ELACHISTA FLAVICOMELLA, n. sp.

Alis anticis brunneis, fascia ante medium tenui obsoleta ♂ (latiore distinctiore ♀), maculis posticis ♂ suboppositis, (♀ per apicem confluentibus) flavidis; *capite flavido, macula fusca.* Exp. al. 3½—4 lin.

Head, face and palpi yellow, *a brown spot on the back of the head in both sexes;* antennæ fuscous. Anterior wings brown; before the middle is a slender, rather oblique yellowish fascia, rather indistinct in the male, broad and very distinct in the female; beyond the middle, in the male, are two small spots, one on the inner margin, and the other, rather posterior, on the costa; the apical portion of the wing in the male is brown, with brownish cilia; in the female these two spots are continued obliquely to the hinder margin, so that the entire tip is pale yellowish, with pale browish cilia. Posterior wings greyish fuscous, with paler cilia.

Most nearly allied to *Elachista luticomella,* but distinguished by the dark spot on the head; the male by its smaller size, and the hinder spots more nearly opposite; the female by the extraordinary apical markings.

Mr. Shield has two specimens which he took at Howth, on the 15th of last July, among grass under brambles; at the time he supposed they were only *Luticomella*, or he would have secured a greater supply.

LITHOCOLLETIS BREMIELLA, Zeller. (*Frontispiece*, Fig. 7.)

Alis anticis *saturate croceis*, linea basali abbreviata, utrinque nigro-marginata, argenteo-alba, *fascia media angulata*, strigulis tribus costæ (ultima interdum obsoleta), duabus dorsi argenteo-albis; striola apicis nigra. Exp. al. $3\frac{1}{2}$—$4\frac{1}{2}$ lin.

Head *fuscous;* face and palpi silvery; antennæ fuscous, the tip whitish in certain lights. Anterior wings rather dark saffron, with a short straight basal streak about a third the length of the wing, dark margined on both sides; in the middle is an angulated silvery-white fascia, margined with black internally and with a few black scales on its outer margin; beyond are three small silvery-white streaks on the costa (the third one sometimes wanting); they are internally margined with black; intermediate between these are two larger triangular silvery-white spots on the inner margin, dark margined on both sides; on the apex of the wing lies a rather small, oval, black spot; hinder marginal line dark fuscous; cilia beyond pale grey. Posterior wings grey, with paler cilia.

Resembles *L. lautella*, but the anterior wings are broader and the ground colour is paler, and the apical portion of the wing is not suffused with black.

This species was discovered a few years ago at Zurich, by Herr Bremi-Wolff, in whose honour it has been named; the larva was detected mining the leaves of several species of *Vicia*. On the 26th of September last I received several mines of this species from Herr Schmid of Frankfort-on-the-Main, and, profiting by the information derived from the sight of these mined leaves, I visited on the 28th a locality

near Bexley, where I was aware that *Vicia Sepium* grew abundantly by the edge of a wood. In half an hour Mrs. Stainton and I had collected about thirty leaves containing larvæ or pupæ, and Mr. Douglas nearly as many—a striking instance of the ease with which new species may be added to our Fauna, if we *coach up the subject*, from those who are already skilled! On the 30th of September a specimen of the imago appeared from the leaves collected on the 28th, and this I exhibited at the Entomological Society the following evening! Mr. Douglas has since bred many specimens, having revisited the locality and collected the larvæ by hundreds!!

The species is double-brooded, the larvæ feeding in July and September; many of the latter brood appear in the perfect state in October, while other specimens remain pupæ all the winter.

NEPTICULA CRYPTELLA, Frey, n. sp.

Alis anticis angustulis albidis, saturate-griseo-squamatis; capillis ochreis, fusco-mixtis. Exp. al. $2\frac{1}{2}$ lin.

Head and face dark ochreous, mixed with fuscous; palpi whitish; antennæ fuscous, basal joint whitish. Anterior wings with coarse dark grey scales upon a whitish ground; cilia pale grey. Posterior wings pale grey, with paler cilia.

Most nearly allied to *Nepticula Septembrella* and *Trifurcula pulverosella*; from the former it is distinguished by the longer and narrower anterior wings being of a paler colour, and more coarsely scaled, and by the absence of the conspicuous pale spot at the anal angle; from *T. pulverosella* it is distinguished by the *much narrower* anterior wings and the darker colour of the head.

Mr. Douglas took three specimens of this insect in Headley Lane, at the end of last June, by sweeping the grass; Professor Frey (the most promising Micro-Lepidopterist in

Europe), has several times taken this species near Zurich, in June.

It may be the imago of the *Lotus*-eating larva.

NEPTICULA BETULICOLA, n. sp.

Alis anticis fusco-æneis, apice purpureo-tincto, fascia *postica* argenteo-albida; capillis luteis, fusco-mixtis. Exp. al. 2 lin.

Head and face yellowish, slightly mixed with fuscous; antennæ fuscous, basal joint whitish. Anterior wings bronzy-brown, *considerably beyond the middle* is a silvery-whitish fascia, of variable breadth, placed nearly perpendicularly; the apical portion of the wing is purplish-brown; cilia fuscous. Posterior wings grey, with grey cilia.

Distinguished from all the allied species, by the proximity of the pale fascia to the apex of the wing; the fascia is more posteriorly placed than in *Microtheriella*, and in that species the fascia is not shining—here it is perceptibly silvery.

Mr. Douglas met with the larvæ of this species in October, 1854, at Headley Lane, mining in birch leaves; it is thus noticed in the Natural History of the Tineina, vol. i. p. 22:—"An amber-coloured larva with green dorsal vessel, making a small contorted gallery, of which the commencement is filled with brown excrement, the latter half having the greenish-grey excrement only in the central portion." Mr. Douglas succeeded in breeding several specimens of this little species; but this last autumn we have failed in again meeting with the larva.

NEPTICULA CONTINUELLA, n. sp.

Alis anticis, basim versus, obscure *æneo-griseis*, apice saturate purpureo-fusco, fascia media saturate purpurea, *fascia pone medium tenui, recta, argentea;* capillis ferrugineis. Exp. al. $2\frac{1}{2}$ lin.

Head and face reddish-yellow; palpi whitish; antennæ fuscous, basal joint whitish. Anterior wings dull *bronzy grey* at the base, shading gradually into a dark purple fascia in the middle; *beyond the middle is a straight, shining, rather slender,* silvery fascia; the apical portion of the wing is dark purplish-fuscous; cilia fuscous. Posterior wings grey, with grey cilia.

Most nearly allied to *N. Aurella,* but readily distinguished by the basal portion of the wing being dull bronzy-grey, instead of rich golden-brown; the fascia too is more perpendicularly placed, more slender and more silvery.

I collected a few of the larvæ of this species, at Lewisham, in birch leaves, in September, 1854; it is thus noticed in the Natural History of the Tineina, vol. i. p. 24:—"A larva, making long irregular galleries, which are entirely filled up with dark green excrement." From these larvæ I bred a single specimen on the 26th of June. Its late appearance would imply that the species is only single-brooded.

Nepticula Alnetella, n. sp.

Alis anticis *saturate* aureo-brunneis, dorso basim versus *dilute* aureo-brunneo, apice nigrescente, fascia paullo post medium parum obliqua *argentea splendidissima;* capillis ferrugineis. Exp. al. 2—2½ lin.

Head and face reddish-yellow; palpi whitish; antennæ fuscous, basal joint whitish. Anterior wings *deep* golden brown, shading off to a *pale* golden brown *on the inner margin near the base;* a little beyond the middle is a rather oblique silvery fascia, extremely brilliant (more so than in *N. marginicolella*); apical portion of the wing dark purple, almost black; cilia dark fuscous. Posterior wings grey, with grey cilia.

Not likely to be confounded with any other species, except *Aurella* and *Marginicolella;* from both it is distinguished

by the general dark ground colour of the basal portion of the wing; only the basal half of the inner margin standing out as strikingly paler: there is no purple fascia before the silvery fascia, and, as has been already mentioned, the silvery fascia is far brighter and rather more slender than in either of those. This insect is the solution of Enigma No. 17 (Entomologist's Annual, 1st Edit. 63; 2nd Edit. p. 86). I met with the larva of this species in alder leaves near Beckenham, October 15th and 22nd, 1854; on the 18th of that month I received some larvæ of the same insect from Mr. Thomas Law of Darlington. It is briefly mentioned in the Natural History of the Tineina, vol. i. p. 24:—"*Alnus glutinosa.* A pale amber larva, making small irregular galleries."

From these larvæ I bred last spring three specimens of this very pretty addition of our *Nepticulæ*, and Mr. Law also bred a specimen or two.

This last autumn I visited the alder bushes just too late, so have no prospect of adding to my store next year.

Pterophorus Zetterstedtii, Zeller.

Expands 10½ lines. Most nearly allied to *P. trigonodactylus*, but much darker in colour; the lobes of the anterior wings especially darker, and the tip of the anterior lobe rather less produced; the pale streak on the second lobe keeps nearer to the hind margin.

For this pretty addition to our *Plumes*, we are indebted to Mr. Boyd, who took several at Lynmouth, North Devon, in July.

The larva, on the continent, is reputed to feed on *Senecio nemorensis;* this is not a British plant, but probably it feeds here on some other species of *Senecio*.

PTEROPHORUS PLAGIODACTYLUS, Fischer v. R.

Expands 9 lines. Very closely allied to *P. bipunctidactylus*, but darker; the black streak in the anterior lobe of the anterior wings is more strongly marked, and the costa beyond the middle is much clouded with dark fuscous.

First discovered by Herr Mann, on the Alps, in July; subsequently taken in Wales, in June and July, 1853, by Mr. C. S. Gregson; this season many specimens have been taken in that locality, and also in Cumberland.

RARE BRITISH SPECIES CAPTURED IN 1855.

COLIAS HYALE; many specimens occurred this autumn in the South.

DEILEPHILA GALII; the larvæ have been met with in various parts of the coast in August and September, frequenting the sand hills on which the *Galium verum* grows; others have been found inland in gardens on fuchsias.

SPHINX CONVOLVULI; I have heard of the occurrence of a single specimen at Teignmouth.

ZEUZERA ÆSCULI; was unusually common near London, in July.

PETASIA NUBECULOSA (Ent. Annual, 1855, 1st Edit. p. 40; 2nd Edit. p. 62); a second specimen was taken by Mr. Almond, at Rannoch, last April, from the bole of a birch.

PTILOPHORA PLUMIGERA; has again been bred from the egg by the Rev. Bernard Smith.

LOPHOPTERYX CUCULLINA, and CARMELITA; both these species have again been met with; the larvæ of *Cucullina* in Bucks, and the imago of *Carmelita* in woods near London. Mr. Crewe also reared several of the former and Mr. Stevens several of the latter species from the egg.

GASTROPACHA ILICIFOLIA; has again been taken on Cannock Chase, near Rugeley, April 27th; see Zoologist, 4740.

ACRONYCTA AURICOMA; many specimens of this were taken at sugar, near Canterbury, in Kent, and also in Sussex, in July last.

SYNIA MUSCULOSA (*Frontispiece*, Fig. 3); a specimen of this pretty rarity was taken by Mr. Winter, on a gas-light at Brighton, August 17th.

MIANA EXPOLITA (Ent. Annual, 1855, 1st Edit. p. 41; 2nd Edit. p. 63); has again been met with at Darlington, by Mr. Law and Mr. Sang.

CRYMODES TEMPLI; has been found both *in the spring* and autumn, by the Rev. J. Johnson, near Huddersfield, among loose stones; one female laid eggs which produced larvæ, but their food could not be ascertained and they all died; see Zoologist, 4741.

SPÆLOTIS RAVIDA; occurred in considerable plenty at sugar, in July, at Epping, Darlington, and in Yorkshire, &c.

LUPERINA CESPITIS; many were taken by Mr. Turner, in the autumn, in the Isle of Wight.

AGROTIS ASHWORTHII (*Vallesiaca*, Ent. Annual, 1855, 1st Edit. p. 41; 2nd Edit. p. 63); has again been met with in North Wales; see Zoologist, 4814.

AGROTIS LUNIGERA; has again occurred at the Isle of Wight; specimens were exhibited at the August Meeting of the Entomological Society of London, by Mr. Dutton.

HELIOPHOBUS HISPIDUS; one bred by Mr. Reading, of Plymouth. Specimens have been taken in the Isle of Portland, by Mr. Bond.

PACHETRA LEUCOPHÆA; a few taken by Mr. Stevens, at Mickleham, by sugar, in June.

APLECTA HERBIDA; the extreme abundance of this insect last summer, in many places where it is not generally common, is a fact worth noticing.

APLECTA TINCTA; abundant at Darenth Wood and other places at sugar.

CLOANTHA CONSPICILLARIS; several specimens were bred from the larvæ by Mr. Harding.

CLOANTHA PERSPICILLARIS; a specimen of this, found in a spider's web, at Ashford, Hants, was exhibited by the Rev. Mr. Hawker, at the May meeting of the Entomological Society.

HELIOTHIS PELTIGERA; Mr. Reading, of Plymouth, has bred this from the larva.

PLUSIA ORICHALCEA; has again been taken on the coast, near Deal, by Mr. Harding.

TOXOCAMPA PASTINUM; has occurred rather freely at Mickleham.

NASCIA CILIALIS and PIONEA MARGARITALIS; these have been taken in Cambridgeshire by Mr. Bond, who exhibited them at the August meeting of the Entomological Society.

BOTYS SILACEALIS (*glabralis*, Wood); a specimen of this rare insect has lately been sent to me for examination. It was taken by Mr. P. H. Newnham, on Culver Cliffs, near Sandown, Isle of Wight, July 6th, 1853.

BOTYS TERREALIS; has been met with rather freely in North Wales, and has also occurred in North Devon, where I accidentally picked a larva in September. It feeds on the flowers of the golden rod (*Solidago virgaurea*).

ENNOMOS ILLUSTRARIA; has occurred rather freely from 1st to 18th August, in the neighbourhood of Bristol, at the street lamps, near to which the specimens are found upon the ground. I allude to the summer brood, which is sometimes thought to be distinct from the vernal species.

ENNOMOS ALNIARIA; a specimen of this was taken by Mr. Winter, at Brighton, September 15th, at a gas-lamp outside the Sussex County Hospital.

SPERANZA CONSPICUARIA; Mr. Bree continues to meet

with this regularly in the neighbourhood of Stowmarket, and will be happy to catch specimens next summer for those in want of this pretty species.

PARASCOTIA FULIGINARIA; another specimen has occurred in the heart of the city.

HARPALYCE PICARIA; occurs regularly in the neighbourhood of Exeter.

ALEUCIS FICTARIA; several were taken last spring in the old locality, Dartford Heath.

ACIDALIA DEGENERARIA; specimens have been taken again in the Isle of Portland, by Mr. Bond, in 1854.

SEMASIA RUFILLANA; Mr. Boyd has bred this from the larvæ, which feed in autumn on the heads of the wild carro (*Daucus Carota*).

OPADIA FUNEBRANA, and ARGYROLEPIA SCHREIBERSIANA; these rare species have both been taken by Mr. Bond, in Cambridgeshire.

EUPÆCILIA SUBROSEANA; this species, or one closely allied to it, has been bred from a larva feeding on the seeds of the cowslip, discovered at Stockton, by Mr. Scott, and subsequently collected in plenty by Mr. Douglas, near Mickleham, in July.

OBSERVATIONS ON BRITISH TINEINA.

(Supplementary to the Insecta Britannica—Lepidoptera, Tineina; and the Entomologist's Companion. 2nd Edition.)

Diplodoma marginepunctella, I. B., p. 20. Two of the curiously-clothed larvæ of this insect have been sent me. One by Mr. Parfitt, of Exeter, in August; the other by Mr. Scott, from Stockton, in September. Neither larva was seen to eat, so that the food still remains a mystery.

Ochsenheimeria Vacculella, I. B., p. 23. Again I have taken this insect *in the house*.

Lampronia prælatella, I. B., p. 38. Mr. Wailes has found the larva of this species feeding on *Spiræa ulmaria*, a new food plant for this singular larva.

Lamprosetia Verhuellella, I. B., p. 39. I ascertained when at Frankfort, that the *young* larvæ of this species mine the leaves of *Asplenium ruta-muraria*, afterwards feeding in a case.

Adela viridella, I. B., p. 50. Herr Krösmann, of Hanover, gave me a bred specimen of this species; the case was found amongst fallen leaves in the spring.

Nemotois Scabiosellus, I. B., p. 52. Mr. Ashworth has mentioned in the Zoologist, p. 4814, that he had "several times seen the female of this species, with her abdomen thrust down among the florets of the *Scabiosa columbaria*, her wings lying expanded on the top of the flower," and has lately sent me the following note:—"I again, this year, saw

the female of *Scabiosellus*, apparently laying its eggs, with abdomen thrust down amongst the florets, and wings expanded on the top. I left the flower, marking it, intending to gather it when the larvæ were likely to be grown, but was confined to home shortly afterwards, and when I again visited the place all had been cut down. I was much disappointed, for that she was laying I feel sure; she had the usual straining and thrusting motion, and after apparently laying an egg in one place, crept across the flower, again thrust in her abdomen. This I saw her repeat twice, and then left her at work. I am sorry I was not able to get the larva, but hope the next time I meet with it to be more fortunate; last winter I picked up and pulled off a great number of the seed heads, but could find no trace of either larva or pupa."

Plutella horridella, I. B., p. 72. According to the observations of Herr Schmid, of Frankfort, the larva of this species feeds on sloe at the beginning of June.

Exæretia Allisella, I. B., p. 82. This has been taken in some plenty by the collectors near Manchester, but the food of the larva has not yet been discovered.

Depressaria Umbellana, I. B., p. 85. The larva of this species has been known for years to Mr. C. S. Gregson, of Liverpool: it feeds on *Ulex Europæus* and *nanus*, forming a dense web of considerable size. I bred the species this summer from the fat greenish larva, mentioned Zoologist, p. 4773, as the probable larva of this insect.

Depressaria capreolella, I. B., p. 90. I bred a specimen of this insect in July, from a greenish *Applana*-like larva found by Mr. Douglas, on *Pimpinella saxifraga*, near Mickleham, June 26th. The larva was then feeding on the pinnate radical leaves.

Depressaria Carduella, I. B., p. 91. Bred by Mr. Boyd from a grey-green larva, with dark head, which fed on the

underside of the leaves of a species of thistle, on the downs at Lynmouth, July 26th.

Depressaria Pimpinellæ, I. B., p. 95. Mr. Winter found the larva of this near Kemsing in Kent.

Depressaria pulcherrimella, I. B., p. 96. This was bred by Dr. Colquhoun, on the 20th July, from a larva feeding on the flower of *Bunium flexuosum*.

Depressaria nervosa, I. B., p. 98. This occurs in the greatest profusion near Dunoon, Argyllshire, where the handsome larvæ were collected in great abundance by Dr. Colquhoun, at the beginning of July. In company with them a few specimens of a lively greenish larvæ were found, but these proved to be only that all-sorts-of-Umbelliferæ-eating pest—*D. applana*. The natural habitat of the pupa is in the stem of the plant (*Œnanthe crocata*; for which purpose, when the larvæ cease feeding, they bore into the stem and then weave a transverse piece of web above and below them. The healthy larvæ seek the main stem; the ichneumoned larvæ the smaller branches of the stem.

Gelechia Hippophäella, Schrank (*basalis*, I. B., p. 105). The older name must be retained for this species. I bred the insect in August and September from pale yellowish-green larvæ, found by Mr. Harding in the shoots of *Hippophäes Rhamnoides*, at Deal, the middle of July.

Gelechia velocella, I. B., p. 108. According to the observations of Herr Schmid, of Frankfort, the larva of this species feeds in tubes at the roots of *Rumex acetosella*, spinning up the stem to some of the leaves; larvæ of all sizes feeding together the middle of June.

Gelechia alacella, I. B., p. 111. Herr Grabow, of Berlin, has found the larva of this species feeding at the end of June on the lichen growing on orchard trees. The larva is greyish-white, with black head and black plate on second segment.

Gelechia Artemisiella, I. B., p. 114. Herr Schmid writes

"larvæ in May on *Thymus Serpyllum* between united leaves,"—a more likely food-plant than *Artemisia*.

Gelechia boreella, I. B., p. 116. Mr. Buxton took three or four specimens of this hitherto-rather-doubted-species in Sutherlandshire in June.

Gelechia instabilella, I. B., p. 126. Mr. Shield bred this insect from larvæ found early in April, near Dublin, mining the leaves of *Plantago maritima*.

Gelechia leucatella, I. B., p. 128. I found the larva, June 17th, feeding between united hawthorn leaves.

Gelechia tæniolella, I. B., p. 132. Herr Schmid reports that this larva feeds the end of May and beginning of June between united leaves of *Medicago minima*.

Gelechia Brizella, I. B., p. 137. Herr Schmid informs me that the larva *winters* in the flower heads of the *Statice armeria*, changing to pupa in April.

Gelechia ericinella, I. B., p. 138. Herr Grabow showed me a life-like portrait of this larva, which subsequently enabled me to find it. I collected several of these elegant larvæ at West Wickham, July 5th: they make very light gossamer-like webs near the ends of the shoots of the heather, and in these webs frequently change to pupæ.

Chelaria Hübnerella, I. B., p. 143. There is some mystery about this insect; from several independent sources I hear the larva feeds on *birch;* we know the perfect insect frequents *poplars*.

Anarsia Spartiella, I. B., p. 144. Mr. Harding has bred this from furze.

Anarsia Genistæ, I. B., p. 144. Mr. Machin has bred this from broom; see Zoologist, p. 4746.

Ypsolophus fasciellus, I. B., p. 146. At the end of September, Herr Schmid sent me some larvæ of this species; they feed on sloe, doubling up the leaf and leaving an opening at each end through which they hurriedly escape on any

alarm, so that they are most easily obtained by beating the sloe bushes where they occur. The larva is yellowish-grey, the head reddish-ochreous, the second segment pale ochreous, the ordinary spots small and black; it is very lively, with a tremulous motion of the anterior segments.

Aplota palpella, I. B., p. 147. When at Hanover, Herr Krössman gave me a specimen of the continental *Balucella* (which we hold synonymous with Haworth's *Palpella*); it was twice the size of our specimens—but he assured me it varied in size, from quite small to those unusual dimensions. *This specimen he had bred from rotten wood!!*

Nothris Durdhamella, I. B., p. 148. This insect is the solution of Enigma No. 13 (Ent. Annual, 1st Edit. p. 64; 2nd Edit. p. 86); "the black and white larva, not unlike that of *Gelechia rufescens*," was found by Mr. Harding at Deal, on the *Origanum vulgare*, at the end of June. The habit of this larva we quoted last year in our "Observations on the British Tineina."

Sophronia humerella, I. B., p. 150. Herr Schmid informs me that the larva of this species feeds on *Gnaphalium arenarium;* this plant is not British, but Mr. Babington suggests "that any of our species of *Gnaphalium* or *Filago* would do in the place of *G. arenarium*, especially the *Filago Germanica*."

Œcophora augustella, I. B., p. 158. Herr Schmid notices of this, "the larva certainly in rotten wood."

Œcophora grandis, I. B., p. 159. In the Zoologist, p. 4814, Mr. Ashworth gives the following notes of its habits: "Not uncommon in the end of May and June, in one fence composed of a mixture of dead and living hazel and birch. They fly only in warm sunshine from 10 a.m. to 1 p.m.; when the sun is off the fence they cannot be made to fly. I think they secrete themselves in dead leaves on the ground, they so soon become worn."

Œcophora flavifrontella, I. B., p. 161. Herr Krösmann has bred this from a singular case found on the ground; the case is rather semicircular, and broad at its straight edge.

Butalis grandipennis, I. B., p. 165. The larva, discovered by Mr. Brockholes, feeds in early spring in a web on *Ulex nanus* and *Europæus*: a figure of its singular web is given in the Zoologist, p. 4773.

Butalis fuscocænea, I. B., p. 166. This insect, so long a rarity, occurred in some plenty at the side of Headley Lane, at the end of July and beginning of August; it also turned up in the North of England.

Acrolepia perlepidella, I. B., p. 170. Mr. Vaughan took about ten indifferent specimens, August 28, 1854, flying in the sunshine round a privet-bush, surrounded by oaks and birches, in Leigh Wood, near Bristol; this year Mr. Vaughan again met with the species in the same locality, June 12th and 28th.

Röslerstammia Pronubella, Ent. Annual, 1855, 1st Edit. p. 44; 2nd Edit. 67. This species has not again occurred; I had fully intended to have it figured last year, but was accidentally prevented: it is now represented on the *frontispiece*, fig. 8.

Glyphipteryx Haworthana, I. B., p. 175. Mr. Edleston says the larva may be collected during the winter in the prostrate heads of the cotton grass (*Eriophorum*); see Zoologist, p. 4654.

Argyresthia conjugella, I. B., p. 184. The solution of Enigma No. 15 (Ent. Annual, 1855, 1st Edit. p. 63; 2nd Edit. p. 85); the larva feeds on the berries of the mountain ash, in September.

Argyresthia glaucinella, I. B., p. 185. Of this species Mr. Ashworth remarks in the Zoologist, p. 4815, "Taken sparingly from the middle of May to the end of June, sitting on the trunks, and beaten from the branches, of three or four very old half-decayed oaks."

Argyresthia arceuthina, I. B., p. 188. Herr Schmid writes, "the larva in May, in shoots of juniper; the green pupa may also then be collected." In this country *May* would be rather late to look for the larva.

Cedestis Gysselinella, I. B., p. 190. Herr Schmid finds "the larva on *Pinus sylvestris*, between leaves, in a white web."

Ocnerostoma piniariella, I. B., p. 191. Herr Schmid states, that "the larvæ feed on *Pinus sylvestris*, mining the leaves."

Zelleria fasciapennella, I. B., p. 192. Professor Frey has taken this in Switzerland, on the Grisons Alps, at Engadine.

Gracilaria elongella, I. B., p. 197. Bred by Mr. Buxton from larvæ making large cones on *birch* leaves.

Coriscium cuculipennellum, I. B., p. 202. Mr. Sang bred this, this summer, from a pupa, enclosed in a long white cocoon, in a rolled up *ash* leaf; next year he hopes to find the larva.

Coleophora paripennella, I. B., p. 211. At length I have succeeded in getting an autumnal larva to live through the winter, and it produced, as anticipated, this species.

Coleophora Wocheella, I. B., p. 212. The larva of this species is well known to Herr Schmid and Professor Frey; the former writes, "larva at the beginning of June, on *Stachys hirta*, preferring the stem to the leaves;" the latter observes, "not scarce on *Betonica* and *Ranunculus* in April and May."

Coleophora ochrea, I. B., p. 212. The larva feeds, so Herr Schmid *assures* me, on *Helianthemum vulgare*, the latter half of June eating the leaves. The case must be very conspicuous; it is more than half an inch long, cylindrical brownish-ochreous.

Coleophora conspicuella, I. B., p. 213. Mr. Douglas and

I each took a specimen in Headley Lane, the beginning of August last. At the same time I found two *young* larvæ feeding on *Centaurea nigra*.

Coleophora saturatella, I. B., p. 216. Herr Schmid finds the larva of this insect at the beginning of July, on broom, (*Spartium scoparium*.)

Coleophora therinella, I. B., p. 217. I took a specimen of this at West Wickham, July 5th.

Coleophora juncicolella, I. B., p. 220. I met with several of this among the heath at West Wickham, July 5th; I had previously learnt from Herr Schmid (who knew it under the name of *Infantilella*), that the larva feeds on heather (*Calluna vulgaris*) in the spring, up to May, feeding on the young shoots, in a small case which looks like small heath-leaves, and is therefore very difficult to detect unless it assumes a direction contrary to the growth of the shoot.

Bedellia somnulentella, I. B., p. 226. This has again occurred in considerable plenty; at Bideford hardly a single plant of *Convolvulus* was unmarked by the larva.

Chauliodus Illigerellus, I. B., p. 234. Herr Krösmann introduced me to the larvæ of this species at Hanover, and I improved my acquaintance with it in the beech forest at Hökendorf, near Stettin; it feeds towards the end of May on *Ægopodium podagraria*, drawing the leaves together by its webs; it is a sticky-looking semi-transparent larva, like that of *C. Chærophyllellus*, but it is solitary in its habits, rarely more than one occurring on a leaf stem; it likes moist places in woods.

Laverna lacteella, I. B., p. 236. Herr Schmid informs me, that the larva feeds on *Epilobium hirsutum*.

Laverna atra, I. B., p. 239. Herr Grabow has also bred the dark variety from apple (see Ent. Ann. 1855, 1st Edit. p. 55; 2nd Edit. p. 77), and entirely confirms Mr. E. Brown's account of its habits. The typical insect has been

bred by Mr. Wilkinson from larvæ feeding in the *berries of the hawthorn*. This further confirms the notion that the hawthorn and apple feeders are two distinct species.

Anybia langiella, I. B., p. 245. Mr. Boyd found larvæ mining the leaves of *Circæa lutetiana*, in July, at Lynmouth, North Devon, and from them bred this species. It is not yet *quite* decided whether this is the solution of Enigma No. 1 (Ent. Annual, 1855, 1st Edit. p. 63; 2nd Edit. p. 85). The larva there mentioned I certainly found in September, at West Wickham and at Bideford, and if these come to maturity, the knotty point will be determined.

Asychna ceratella, I. B., p. 246. Mr. Douglas met with several specimens of this insect at Darenth Wood, in July. The larva and its mode of life have been beautifully represented by Herr Grabow, of Berlin, and I extract the following from his notes:—"The 26th September, 1852, Herr Kalisch discovered a pod-like excrescence on *Polygonum aviculare*. Such a growth not being usual on that plant he cut it open, and found a larva enclosed in a cocoon. On the outside of this excrescence there was not the slightest trace of any injury from the larva, and we must therefore conclude that when the larva escapes from the egg it bores into a bud, and so causes this growth, which then grows around the larva and encloses it, the larva feeding upon its fleshy interior. Before the larva changes to pupa (which happens in the month of May) it eats a small opening towards the end of its habitation, and through this some 'frass' makes its appearance—this is a certain sign that the larva is about to change to a pupa." This discovery of Herr Grabow's, of a gall-producing Lepidopterous larva, is of extreme interest!

Chrysocorys festaliella, I. B., p. 248. Mr. T. Wilkinson, of Scarborough, sent me in September some larvæ of this species, and subsequently I found them at Bideford rather commonly. They feed either on the upper or under-

side of bramble-leaves, eating the leaf half through and making conspicuous blotches, which are very evident, even when you are not specially looking for them. The larva agrees well with Hübner's figure, which is copied by Curtis.

Elachista Pfeifferella, I. B., p. 250. This appears to have a similar habit to *Treitschkiella*, having *apparently* been bred from case-making miners of the dog-wood.

Elachista Brunnichella, I. B., p. 251. The solution of Enigma No. 2 (Ent. Annual, 1855, 1st Edit. p. 63; 2nd Edit. p. 85), but the food-plant was wrongly named *Origanum*; it is CLINOPODIUM *vulgare*. The larvæ were collected by Mr. Douglas, at Darenth Wood, in July, and by myself near Mickleham, the beginning of August, and from them we bred several of the perfect insect.

Lithocolletis Frölichiella, I. B., p. 278. The mine of this is unusually long, far longer than in *L. alnifoliella*, and the cocoon is extraordinarily large. Mr. Scott meets with this near Stockton.

Lithocolletis Stettinensis, I. B., p. 280. Bred freely from the larva collected in October, 1854, mining the *upper* side of alder leaves, near Beckenham.

Lithocolletis comparella, I. B., p. 282. Mr. Douglas bred this in August, from a larva found at the beginning of that month mining the underside of a leaf of Lombardy poplar, near Mickleham.

Lyonetia padifoliella, I. B., p. 284. Professor Frey has lately sent me specimens of this insect (his *Albella*), of *Prunifoliella*, and of the Hübnerian *Padifoliella*, with the remark:—"I bred in August all these forms from one kind of sloe mine, with similar larvæ, and am disposed to unite them all as *one* species. The mine is broad, not narrow like that of *Clerckella*. *Albella* is very scarce, *Padifoliella* the commonest. The pupa is suspended as in *Clerckella*." After groping so long in the dark about this species, such a glare of light is rather dazzling!

Phyllocnistis suffusella, I. B., p. 285. I met with this very interesting larva in great profusion at Mickleham, the beginning of August; they mined indifferently the upper or underside of the leaves of the aspen (*Populus tremula*). The mined leaves show no distinct track, as the larva eats only the juice by which the skin of the leaf is fastened to the parenchyma, but when we view the leaves at an angle they appear shining and reflect prismatic colours, as though a snail had crawled across them.

Bucculatrix aurimaculella, I. B., p. 291. I had the good fortune to signalise my first evening "across the channel" by finding the larva of this species at Boulogne, April 17th; it feeds on *Chrysanthemum leucanthemum* (ox-eye daisy), when young mining the leaves, afterwards feeding on them externally; it makes a ribbed whitish cocoon. *Bucculatrix nigricomella*, not hitherto found in this country, feeds on the same plant and at the same time.

Bucculatrix cidarella, I. B., p. 291. We have found the larva of this species feeding on alder leaves in July, but hitherto we have not succeeded in rearing it.

Nepticula angulifasciella, I. B., p. 304. By keeping the collected larvæ of this species out of doors all the winter, I succeeded in rearing a fine series of the perfect insect; they made their appearance from the 13th to 28th of July, a sufficient proof that the insect is only single-brooded.

Pterophorus acanthodactylus. Mr. Reading, of Plymouth, has met with the larvæ of this species on rest-harrow (*Ononis*), and forwarded me several of them, at the beginning of August. Hübner's figures of *P. Calodactylus* well represent the larva and singular pupæ of this species. This is an addition to our information, for in the Zoologist, p. 4775, in the Entomological Botany, under *Ononis spinosa* I called attention to the fact of the larva of this species not having been found on that plant.

Pterophorus brachydactylus. Professor Frey finds the larva of this (with us, great rarity) on the underside of the leaves of *Prenanthes purpurea*, in fir woods, in May; *that* plant is not British, but is not unfrequently found in woods escaped from cultivation.

Pterophorus tephradactylus. Professor Frey finds the larva of this on *Solidago virgaurea* in May; I met with the *young* larvæ on that plant, at Clovelly, in September.

ANSWERS TO ENIGMAS.

Answers to ENIGMAS in the ENTOMOLOGIST'S ANNUAL, 1855, 1st Edition, p. 63; 2nd Edition, p. 85.

1. Probably *Anybia langiella;* see ante, p. 57.

2. *Elachista Brunnichella;* see ante, p. 58.

3. I found this abundantly at Hökendorf, near Stettin, but all my specimens *went squash,* on my journey homewards; Professor Zeller considered it, without any hesitation, *Coleophora Lixella.*

4. *Coleophora siccifolia;* see ante, p. 37.

5. Not yet solved.

6. Not yet solved.

7. Not yet solved.

8. Not yet solved.

9. From larvæ apparently referable to *Basicolella,* I have bred what seems only *Tityrella;* the matter requires further investigation.

10. Not yet solved.

11. Not yet solved.

12. Reared by Mr. Gregson. The food plant is *Vaccinium Vitis Idæa;* the insect *Anchylopera ustomaculana.*

13. *Nothris Durdhamella;* see ante, p. 53.

14. *Argyrolepia maritimana;* see ante, p. 34.

15. *Argyresthia conjugella;* see ante, p. 54.

16. Not yet solved.

17. *Nepticula alnetella;* see ante, p. 43.

Thus of seventeen Enigmas seven are completely solved; three yet remain in a somewhat doubtful state, and seven are completely unsolved; the latter we proceed to repeat for solution (we hope in our next).

ENIGMAS STILL UNANSWERED.

5. "*Nepticula* larvæ, in leaves of *Potentilla fragariastrum*." I believe Professor Frey has met with this larva near Zurich, and has them now in cocoon.

6. "*Gelechia*? larvæ, folding up the leaves of *Lathyrus pratensis* and *Vicia Sepium*." Again found this autumn; Herr Schmid has also met with it at Frankfort, whilst collecting mines of *Lithocolletis Brennella*.

7. "A *Gelechia*? larva on oak, forming an entire leaf into a vaulted chamber." Is not this *Anchyopera subuncana*?

8. "On apple, a new *Nep.* larva, greenish, with dark greenish dorsal line, mining a gallery: found also rather commonly on hawthorn leaves." None have yet been reared, and this autumn it has escaped me.

10. A *Nepticula* larva, making brown blotches in birch leaves." I have received a few larvæ this autumn from Mr. T. Wilkinson, of Scarborough.

11. "An *Elachista* larva, found by Mr. Scott at the end of April, mining in leaves of *Scirpus lacustris*." Has not again been met with.

16. "A *Nepticula* larva, found by Mr. Scott, making blotches in the leaves of *Lotus corniculatus*." I found this larva in leaves of *Lotus major*, at Headley Lane, August 4th, but did not succeed in rearing them. Professor Frey also finds it near Zurich, and has now *about twenty in cocoon*.

NEW ENIGMAS FOR SOLUTION.

18. A *Lithocolletis* larva mining the upper side of birch leaves. A few were found by Mr. Scott, in September, 1854; none were reared.

19. A *Coleophora* larva, feeding on the capsules of *Silene inflata*. Mr. Weir found one a few years ago, but when in Paris I saw several in the possession of M. Bellier de la Chavignerie, who (knowing my especial predilection for these atoms) very liberally gave them to me; none were reared. This may be *Albifuscella* or *Leucapennella*. In either case it will be a grand addition to our British *Coleophora*.

20. A *Depressaria* larva found by Mr. Boyd, May 2nd, (it was then *young*), feeding on a leaf of parsnip (*Pastinaca sativa*), under a turned-down corner; this was expected to be *Depressaria Douglasella*.

21. A very singular birch-leaf miner discovered by Mr. Boyd, at Lynmouth, July 19th: the young larva makes a very long linear mine (two or three inches!) commencing near the top of the leaf, mining nearly parallel to the midrib, till it reaches the foot-stalk of the leaf; it then mines towards the edge and commences making a large blotch, and after a while it cuts out an oval case in this blotch and descends to the ground. Advised by the sight of the leaves he sent me, I went out and at once found the same larva in my own immediate neighbourhood.

22. A very similar mine I observed on the 29th July, on alder leaves, but was too late for the larvæ, they having all

cut out their cases and departed. Their cases were evidently considerably larger than those of the birch miner, and the blotch-portion of the mine was not as large. Similar mines on alder leaves have been found by Professor Frey, at Zurich.

23. An *Elachista* larva, found by Mr. Scott, at Stockton, mining in September and October the leaves of *Brachypodum sylvaticum;* the larvæ, apparently nearly full fed, making long broad mines in the leaves, but not puckering them. Herr Schmid has also sent me this larva from Frankfort.

24. A *Coleophora* larva feeding on the seeds of *Solidago virgaurea*, in October. Herr Schmid sent me some of these on the 15th of that month, and I instructed Mr. Parfitt, of Exeter, to seek for them in his neighbourhood. In a few days he sent me up a box containing a number of this new larva. Its case is very peculiar, having the down of the seeds attached to the anterior end, but loose behind, somewhat like a hedgehog, but it is not densely clothed with this down.

COLEOPTERA.

Notes on British Geodephaga, with Description of one New Species (Supplementary to Geodephaga Britannica).

(By J. F. Dawson, L.L.B.)

In taking a brief retrospect of the progress which has been made in the discovery of additional localities for some of the newly introduced and less commonly distributed species of British *Carabidæ* since the publication of the *Geodephaga Britannica*, which have not as yet been publicly recorded, I observe with satisfaction that that work has, in no small degree, tended to awaken a more lively interest in a group of insects, which I seemed to have taken under my more immediate protection, but which had been previously somewhat neglected or but slightly appreciated by other parties. Their attention, however, having been thus attracted towards this interesting group, which will well repay investigation, many of my Entomological friends have devoted their energies in searching those localities which are supposed to be most favourable to their production.

The result of their labours has been in no small degree successful; for though we cannot boast of the discovery of new species (with a single exception), yet many which at the period above alluded to were almost entirely unique in private collections, as *Dyschirius impunctipennis*, *Anchomenus scitulus* and *pelidnus*, *Harpalus cordatus*, *Trechus incilis* and *Bembidium obliquum* and *Clarkii*, have since turned up

in considerable numbers, whilst others, which, though they have not equalled these in point of rarity, were nevertheless of somewhat unusual occurrence, have been discovered in positive profusion; as *Lebia cyanocephala, Callistus lunatus* and *Bembidium doris*.

Of novelties we have not much to record. The most important is a very remarkable *Dyschirius*, which will be described in this paper. Two examples were discovered by Mr. Syme, in April, 1855, near Sandown Castle, Deal. It was captured (I would observe) not in a new and unexplored locality, but on a spot of damp ground frequently and carefully searched in previous years, by myself and others, and one which I had indicated to Mr. Syme as being a favourite resort of the *Dyschirii*. In the very same hollow and beneath the very stones which had in those previous years been found to yield a good harvest of insects (though not perhaps at that precise season), this new British *Dyschirius* unexpectedly made its appearance. And I seize upon this fact as offering a fresh inducement to Entomologists by no means to relax their efforts in the examination of known and frequented localities, under the impression that their stores of *species* must have been exhausted, nor to confine their labours to one or two particular seasons of the year, since even in such places, as it is seen, novelties may eventually turn up to reward their assiduity.

I would also call the attention of Entomologists to other localities, which, in former times, bore the character of being the very metropolis of insect life, but which have in more recent years been little explored, or entirely neglected. When we read of the reputed productions of Devonshire, for instance, we naturally demand to know whether cultivation, that greatest foe to the Entomologist, has so entirely changed the character of that county (so favourable to the development of insects) that it no longer produces such much prized

rarities as *Carabus intricatus* and *Diachromus Germanus*. We should be unwilling to admit it without a more careful and systematic investigation, though we well know that in many other parts of England (especially in the fen districts), the advance of extensive drainages and cultivation has most assuredly had the effect of entirely banishing those Entomological productions which formerly abounded in such localities. The fact is, except certain portions of that county and those at particular seasons of the year, not the most favourable for *Geodephaga*, it has been very little searched of late years for that class of insects. An important portion, namely, all that wild district bordering on Dartmoor, not at all. During a very brief visit, limited in fact to two or three days, which Mr. Wollaston paid to a wild uncultivated tract called Slapton Ley, not far from Start Bay, he succeeded in obtaining several examples of a fine *Harpalus*, new to the British Fauna. I should rejoice, therefore, if any hardworking, practical Entomologist would investigate all those districts carefully and systematically, and that not merely at one but at various seasons of the year, and especially in the spring, which would there be found most productive. It is unsatisfactory to be obliged to admit that there are yet species, which we are bound to include among our indigenous *Carabidæ*, on the authority of specimens existing in collections, of which no man living can say, "I have taken such an insect." *Lebia hæmorrhoidalis*, *Brachinus sclopeta*,* *Chlænius agrorum*, *Anchomenus modestus* and *Diachromus Germanus*, are all (according to Stephens) reputed natives of Devonshire, but they seem to have entirely disappeared; their places in our cabinets are vacant, till we almost begin to doubt whether they have not become utterly extinct, even if we do not go to the extent of discrediting the fact of their

* Through inadvertency, I stated that the Rev. A. Matthews received this insect from Mr. Vigors. I should have said from Mr. Sowerby.

ever having been captured in the localities assigned to them.

There is likewise another very promising district, which, I believe, would well repay investigation, but which appears to have been entirely neglected of late years. It is situated on the north-west and northern coast of Norfolk, extending from Heacham and Hunstanton, and so on to Burnham Market, Wells and Cley. In fact we know very little of the Carabideous productions of the north-eastern counties, beyond a vague impression that several valuable species are reputed to have been captured in those parts of the kingdom, and perhaps on this hint some Entomologist may be induced to study their productions more systematically. There are likewise one or two remarks I have to offer on the subject of collecting. We do not, I think, search methodically enough. Most of these insects are nocturnal feeders. During the day they remain concealed in crevices, or at the roots of herbage, or under clods and stones, or buried under the soil or anywhere that offers a refuge or concealment, and are generally at that time torpid and inactive; at night they are alive and busy. It is a fine sight to see them then, or just at daybreak, in some favourable locality rushing about in all directions and running up and down the stems of herbage. Now, the very time when they are most inactive and hidden we select for hunting them out. In the daytime we turn stones and clods, and tear up the herbage and rend it into fragments, and grub up the soil to force them out, with great trouble and exertion, and work as hard as any day labourer, yet incredible numbers entirely escape all our researches. But we do not trouble ourselves even to look for them at night when they leave their concealment. The Lepidopterist works principally at night, but the Coleopterist confines his labours too exclusively to the daytime; and, therefore, I would strongly recommend

nocturnal brushing, which *has* proved very successful, and I have known the locality of a rare species discovered solely by that means; and for these Carabideous insects especially, I would call attention to a plan adopted by Baron Chaudoir, which is, to spread a white cloth on the ground at night in some promising locality with a brilliant light in the centre, and the insects being attracted thereto may be secured in numbers, and many species, which had not previously been suspected to exist in the locality where the plan is adopted, may by that means be discovered. Such *has* been the result—and certainly the contrivance is a good one—where it can be practised without arousing the jealousy and displeasure of gamekeepers and revenue officers.

I transcribe M. Chaudoir's account for the benefit and encouragement of those Entomologists who are disposed to adopt his scheme, and I wish them equal success. "La soirée fut très-chaude, et j'en profitai pour essayer d'un moyen que M. de Stéven m'avait indiqué comme très-commode pour se procurer beaucoup d'insectes que l'on ne rencontré presque jamais autrement. Il consiste à poser deux flambeaux sur une nappe étendue à terre à proximité des lieux qui servent en général de refuge aux insectes, tels que prairies, bois, pierres, etc.: les localités humides sont en général préférables. Attirés bientôt par l'éclat de la lumière, les insectes de tous les ordres s'y portent en foule. Je pris de cette manière des *Harpalus*, des *Ophonus*, des *Chlænius*, ... des *Brachélytres*, des *Hydrocanthares*, des *Hydrophiliens*, des *Pselaphiens* et d'autres insectes."—*Enumération des Carabiques et Hydrocanthares du Caucase: Introduction*, p. 20.

In the following record of the captures of our more uncommon species of *Carabidæ*, it will be perceived that the most important results have been attained since the publication of the *Geodephaga Britannica* in the metropolitan and

southern districts. All the additions which have been made to specimens which were previously wholly unique or very sparingly distributed in our collections are attributable to the persevering exertions and enterprise of my Entomological friends south of the Trent, whilst, as far as I have been able to ascertain, nothing whatever material has been done in this group by the northern Entomologists. If otherwise, the facts have not been communicated to me. It is true, that *Elaphrus Lapponicus* and *Anchomenus fulgens* have again been captured in some numbers in the localities previously recorded; but of the recently introduced and rarer species, as *Dyschirius jejunus*, *Anchomenus 4-punctatus*, *Trechus longicornis*, *Bembidium Schuppelii* and *Stomoides*, we have no additional record. Nevertheless, upon the whole, I think we may consider that an important advance has been made in the investigation of this group of *Coleoptera*. The mere fact of so many species, heretofore perfectly unique or nearly so in British collections, having been found in some abundance, is of itself no little gain; and, in the hope that next year's "Annual" will record captures still more important and extensive, I proceed to the principal object of this paper, viz. an enumeration of the less commonly distributed species of British *Carabidæ*, with the new localities and dates of capture, which have occurred since the publication of the *Geodephaga Britannica*, in April, 1854.

Drypta emarginata, Fab. S. El. i. 230; Dawson, Geod. Brit. p. 4. Ten specimens have been captured by Dr. Power and others during the months of July and August, 1855, on an old hedge-bank by the side of a corn-field, near Alverstoke, Hants; and three by A. Adams, Esq. at Rowner, about three miles inland.

Dromius 4-signatus, Dej. Spec. i. 236; Dawson, Geod. Brit. p. 10. This insect was captured many years ago, and by no means sparingly, by Dr. Power, in the months of

March and April, in a small thicket close to the river Cam, on the left hand side of the footpath leading from Cambridge to Granchester, not far from the latter place. Dr. Power shook a single example out of moss from Dulwich Wood, in 1854, and Mr. Grant has taken a few from under the bark of old apple trees at Putney, in the months of November and December of the same year.

Lebia cyanocephala, Linn. F. S. 794 (*Carabus*); Dawson, Geod. Brit. p. 18. This insect was found in profusion at the beginning of August, 1854, at Buckland Hill, near Reigate, by brushing the *Hypericum perfoliatum*; but not a single example has been procured this year.

Tarus axillaris, Fab. Ent. S. i. 132 (*Carabus*); Dawson, Geod. Brit. p. 22. This insect, after the lapse of some years, has again been taken in its old locality, Box Hill; it was found on the 21st of April, 1855, on the Dorking side of the hill under stones, and abundantly in the same place at the beginning of August and following months. It has likewise been taken rather plentifully at the east end of Box Hill, not far from the fir plantation, both at the above date and in September and October. A few examples were procured on Buckland Hill.

Dyschirius impunctipennis, Dawson, Geod. Brit. p. 29, pl. i. fig. A. In addition to the three examples of this newly introduced species recorded in the *Geodephaga Britannica*, something like a series has been taken on the Lancashire coast. The locality is Crosby shore, between Liverpool and Southport, above high-water mark, at the base of the sand hills. Mr. Gregson found them crawling on the dry sand in the sunny weather of the month of July; and the Rev. H. Clark secured the insect on the north of Southport, in October, by tearing up the roots of grass on the sandhills. I would recal the attention of those Entomologists who may search for the insect in future to Mr. Wollaston's more suc-

cessful method of obtaining the *Dyschirii*, recorded in the Zoologist (p. 1671).

Dyschirius elongatulus. Head black, narrow, the whole surface above the mouth depressed and somewhat rugose, having a distinctly raised emargination on the anterior border, and a second transverse elevation behind like a little band, also a deeply impressed longitudinal fovea on each side behind the eyes, which gives them the appearance of considerable prominency; antennæ ferruginous, their basal joints and those of the palpi brighter red. Thorax shining black, as broad in front as the head, including the very prominent eyes, and increasing in width till behind the middle, strongly rounded and globose behind where the posterior angles should be; disk very convex, especially behind, dorsal furrow fine and transversely strigose, terminating in front in a distinct transverse impression, and behind (where it becomes deeper) in another depressed space, which appears like a transverse collar or band, which is closely striated longitudinally. *Elytra* brassy black, elongate, twice as long as the thorax, narrow and *cylindrical*, not attenuated at the apex but merely rounded; punctate-striated, the punctures distinctly impressed as in *salinus*, deepest in front and gradually fainter towards the extremity; the punctures of the fourth and fifth striæ are however distinct till they terminate before the extremity, and are succeeded by a smooth stria which is carried obliquely to the tip; the three exterior punctured striæ are very fine, terminating at the shoulder, two of them abbreviated and united behind, but the lateral one, although abbreviated likewise, is succeeded after a little interval by a more deeply impressed smooth stria, which also tends obliquely towards the tip exterior to the other one above-mentioned, and with it forms a kind of loop; underside black, legs red, *anterior tibiæ unarmed.* Length $2\frac{1}{4}$ lines.

Two examples were captured by Mr. Syme, in April, 1855, on a damp spot of ground near Sandown Castle, Deal, beneath stones, in company with a number of *D. salinus*. My description is taken from an examination of these two examples (one of which is now in my possession, through the liberality of Mr. Syme). The peculiar cylindrical form of the insect would seem to approximate it to *D. cylindricus* or *oblongus* (with which it agrees in some of its characteristics), but the absence of any appearance whatever of denticulations on the anterior tibiæ, immediately separates it from the former, and as the latter (which is unique in Sturm's Collection, being represented by a solitary example from the Crimea) is described as being the largest of the European *Dyschirii*, equalling 3 lines in length, it cannot of course be identical with *that* species; and moreover, since it does not even remotely correspond with any other that I find recorded, it is here given as an undescribed species, under the name *elongatulus*.

Carabus intricatus, Linn. F. S. 780; Dawson, Geod. Brit. p. 34. I have stated in my Monograph that four or five examples of this insect were captured by the Rev. Mr. Hore, under the moss and lichens growing on the lower part of the trunks of trees in the woods at Bickleigh Vale. Mr. Hore has kindly furnished me with the following additional particulars. The exact locality in which they were found is by the side of a road through a wood, leading from Fancy, on the Tavistock road, about five miles from Plymouth, to the river in Bickleigh Vale. They were all captured in the spring, March and April, under the moss at the base of oaks, and were in no instance more than a foot above the ground. These were taken more than twenty years ago; and though Mr. H. has many times hunted the same locality since, he has never again found an example. The spot where Dr. Leach first discovered the insect is Virtuous Lady

Mine, on the banks of the Tavy, eight or ten miles distant from the before-mentioned locality. Mr. Hore adds, that a single example was taken some years since by G. W. Soltau, Esq. in a wood belonging to him at Lee Mill, near Ivy Bridge, about eight miles from the Bickleigh Vale Station, in a different direction from Dr. Leach's locality. He was cutting the stems of ivy from trees when he secured the insect, which is now in Mr. Hore's possession.

Calosoma inquisitor, Linn. F. S. 789; Dawson, Geod. Brit. p. 42. Mr. Plant took seven beautiful specimens last June, in a wood near Leicester, this is a more northern locality than those previously given.

Notiophilus rufipes, Curtis, Ent. pl. 254; Dawson, Geod. Brit. p. 55. Seven additional examples of this rare insect have been captured by Dr. Power, viz.:—three on the 10th of June, and four on the 28th of October, 1855, in a sand-pit at Shirley, near Croydon.

Badister peltatus, Panz., Faun. 37 (*Carabus*); Dawson, Geod. Brit. p. 61. Three examples only of this rare species are recorded in the *Geodephaga Britannica*, as having been captured in England; but among a mass of insects taken by Dr. Power about the year 1835, near Cambridge, four others have since been detected, which for twenty years had remained unnoticed in his Collection. Dr. Power obtained also four specimens in 1853, from the Hammersmith marshes.

Chlænius holosericeus, Fab. Mant. i. 199 (*Carabus*); Dawson, Geod. Brit. p. 65. On the 21st of May, 1833, two examples were found by Dr. Power in Reche Fen, Cambridgeshire, by the side of the main road, soon after leaving the village of Reche. Also two or three others were found by him in a swampy place in the village of Isleham, between Fordham and Mildenhall, near Newmarket. Part of the village is situate in an old gravel pit, near which is the swamp.

Callistus lunatus, Fab. Ent. S. i. 163 (*Carabus*); Dawson, Geod. Brit. p. 68. Found in profusion from March till October or November, 1854, on Buckland Hill, near Reigate, close to the edge of the copse wood; Dr. Power informs me he has taken thirty or more from a few square feet of ground, and he has little doubt that as many as 500 were captured last year in that one locality. It is less abundant and more dispersed in the summer, and harbours under tufts of grass and stones, &c. The late Rev. D. F. Jarman found the species in some plenty also on a grassy bank between Dover and Radegunds Abbey, about June in the same year.

Anchomenus 6-punctatus, Linn. F. S. 807 (*Carabus*); Dawson, Geod. Brit. p. 85. Taken in some of the moist hollows on Woking and Wimbledon Commons, at the beginning of August, 1855.

Anchomenus gracilis, Sturm, D. F. v. 197 (*Agonum gracile*); Dawson, Geod. Brit. p. 91. This very distinct and elegant species was captured by the Rev. H. Clark, at Horning Fen, in September, 1854, in some plenty.

Anchomenus scitulus, Dej. Spec. iii. 162 (*Agonum*); Dawson, Geod. Brit. p. 91. This species was unique in the Stephensian Cabinet, at the date of the publication of the *Geodephaga Britannica*, but has been detected by Mr. F. Grant in the neighbourhood of Putney. He has found it locally abundant under refuse in a ditch of a water-meadow near the Thames, between Putney and Hammersmith, into which the high tides occasionally flow. It is found almost in the water, from June to September. It is one of the most valuable additions to our indigenous fauna, being a perfectly distinct and constant species. The examples in the Stephensian Cabinet are stated to have been found in Plaistow Marshes.

Anchomenus pelidnus, Payk. Faun. i. 134 (*Carabus*); Dawson, Geod. Brit. p. 93. This species (of which not

more than two or three British examples had previously been known) has been taken in abundance by Mr. F. Bates, at Groby Pool, near Leicester, chiefly in the month of August, 1855.

Anchomenus Thoreyi, Dej. Spec. iii. 165; Dawson, Geod. Brit. p. 94. May be taken plentifully in the Hammersmith Marshes during the month of October, by shaking the cut reeds; but in spring and summer they are more dispersed and less easy to be obtained. The species has been found likewise in many marshy places near London, and at the reservoir near Daventry, which yielded *Bembidium obliquum* and other valuable species.

Pterostichus lepidus, Fab. Mant. i. 200 (*Carabus*); Dawson, Geod. Brit. p. 98. The old locality at Charlton appears to have become quite exhausted; not an example of this insect has been found there for many years. About a dozen specimens however have been taken by Dr. Power and Mr. Syme, in the old gravel pit, near the railway station, at Weybridge, chiefly in the months of May and June, and a pair (in copulâ) in August, 1855.

Pterostichus ruficollis, Marsh. Ent. 456 (*Carabus*); Dawson, Geod. Brit. p. 112. This insect has been taken in abundance by Dr. Power, at the foot of the cliffs at Kemp Town, and found by him (in copulâ) on the 6th of April, 1855.

Amara plebeja, Gyll. Ins. Suec. ii. 141 (*Harpalus*); Dawson, Geod. Brit. p. 124; *A. septentrionalis*, Curtis, Ann. Nat. Hist. v. p. 275; Ent. Ann. p. 84. The insect described by Mr. Curtis, under the latter name, and noticed in the Entomologist's Annual for 1855, is merely a small green ♂ of *A. plebeja*. The other three supposed species therein alluded to (*agilis*, *puncticollis* and *Dalii*) also belong to recognized species. I had them for examination whilst my Monograph was in progress, but finding such to be the case, did not feel called upon to notice them particularly,

especially as Mr. Rylands was not disposed to insist upon their distinctiveness.

Anisodactylus binotatus, Fab. Mant. i. 199 (*Carabus*); Dawson, Geod. Brit. p. 131; Var. *H. spurcaticornis*, Steph. Mand. i. 157. The variety I omitted to notice in the *Geodephaga Britannica*. It is remarkable, much smaller than the type, entirely black, except the base of the antennæ, which is red, and the forehead is spotless. It is very abundant in a humid depressed spot on Woking Common, to the south east of the railway station.

Diachromus Germanus, Linn. S. N. ii. 671 (*Carabus*); Dawson, Geod. Brit. p. 132. The Rev. A. Matthews informs me that he possesses a specimen which was captured by the late Mr. Holme, near Ryde, in the Isle of Wight, in the summer of 1838 or 1839. He saw the insect when Mr. Holme returned from the Isle of Wight, and has no doubt of its authenticity.

Harpalus azureus, Fab. Mant. i. 201 (*Carabus*); Dawson, Geod. Brit. p. 134, var. B. This species is extremely abundant in the spring on the side of Buckland Hill, near Reigate, and is to be met with likewise in the summer and autumn. The variety B. which I have described as rather larger, with a more coarsely punctulated thorax, and elytra pitchy-black, without any tinge of green, is stated by Dr. Power to be not uncommonly met with in the same locality. Upon an examination of the Dejeanian collection which was fortunately afforded me in August, 1854, I discovered (as I had suspected in fact) that this variety corresponds with *H. similis*, Dej.; but I do not, nevertheless, believe in its distinctiveness as a species.

Harpalus cordatus, Dufts. Faun. ii. 169 (*Carabus*); Dawson, Geod. Brit. p. 136. Two additional specimens were captured by Mr. Syme, in April, 1855, at the roots of the coarse grass on the sand hills, near Deal, the locality in

which I discovered it; and four others by myself on the 6th of July, under rejectamenta, in one of the hollows, near the same spot. All these are of rather a darker colour than my original specimen. During a second visit to the above-named locality in August, I had the good fortune to secure a fine series of examples, presenting a greater or less depth of colouring, varying from rich ferruginous to deep piceous, the result of different stages of maturity; the lighter coloured individuals, however, are not in every instance the least mature. It appears that my description of the original example, which I discovered two years ago on the sand hills at Deal, is applicable to an immature representative of the species; but even in darker specimens the same peculiarity which is recorded in my description of the elytra, "an oblong obscure dark patch, extending up the sides and leaving the centre more or less ferruginous," is observable in many instances, though frequently the ferruginous tint is diffused and blended with the darker shade, and sometimes the latter entirely prevails.

Harpalus rupicola, Sturm. D. F. iv. 105, pl. 94; Dawson, Geod. Brit. p. 136. This insect has been found in some plenty during the spring and autumn of 1855, on the side of Buckland Hill; and at both seasons of the year many of the specimens were immature. It appears to be very local, and I have found it principally on the western end of the hill, sometimes in company of a remarkably large variety of *puncticollis* some way up the slope.

Harpalus litigiosus, Dej. Spec. iv. 361; *H. Wollastoni*, Dawson, Geod. Brit. p. 144. I have ascertained, by an examination of the collection of the late Comte Dejean, that the insect which I described under the name *H. Wollastoni* (provisionally, after the captor) is identical with *H. litigiosus*, Dej.

Stenolophus Skrimshiranus, Steph. Mand. i. 166; Daw-

son, Geod. Brit. p. 155. Found by Dr. Power in great abundance on the 28th of July, 1855, on the banks of a muddy ditch, near Alverstoke, Hants, in company with *S. luridus*.

Stenolophus elegans, Dej. Spec. iv. 412; Dawson, Geod. Brit. p. 156. Three or four additional examples of this insect have since been captured by Mr. Syme, in the Isle of Sheppey, in the locality where it was originally discovered.

Stenolophus consputus, Dufts. Faun. ii. 148 (*Carabus*); Dawson, Geod. Brit. p. 157. I have secured about thirty examples of this insect in a willow thicket near my residence, "The Woodlands, near Bedford," in June, 1855. It has been found also abundantly, near Newark, by Mr. Hadfield.

Stenolophus dorsalis, Fab. Mant. i. 205 (*Carabus*); Dawson, Geod. Brit. p. 158. Taken abundantly in a hollow about the middle of Wimbledon Common, by Mr. Syme, at the end of June, 1855, in company with *S. luridus*.

Trechus lapidosus, Dawson, Geod. Brit. p. 168. The merit of the first discovery of this insect is due to Mr. Curtis, who originally detected it beneath clods of earth, at the base of the cliffs, in the Undercliff, Isle of Wight: he has likewise found it at Dover and in the Isle of Portland; and Dr. Power took a specimen near Brighton, in October, 1853.

Trechus incilis, Dawson, Geod. Brit. p. 168. About sixteen additional examples have been captured in the fens between Holme and Yaxley, Hunts, by a labouring man employed by the late Mr. Jarman to collect insects for him, and who sent these to him among a vast mass of useless things. During a visit I paid to those fens, limited to a few hours in June, 1855, I found in one of the few unburnt and uncultivated spots now remaining, a couple of very immature individuals of this species.

Bembidium 5-striatum, Gyll. Ins. Suec. ii. 34; Dawson, Geod. Brit. p. 177. Several examples of this species, generally rare in British collections, were secured by Dr. Power on the 6th of April, 1855, at the foot of the cliffs, close to Kemp Town, in company with *P. ruficollis*.

Bembidium Bruxellense, Wësmael, Bull. Acad. p. 47; Dawson, Geod. Brit. p. 182. This distinct species has been found plentifully in a small marsh near the Redhill Station, on the London and Brighton Railway, in July, 1855; also in swampy places on Woking Common.

Bembidium affine, Steph. Mand. v. 386 (*Peryphus*); Dawson, Geod. Brit. p. 190. Found in abundance by Dr. Power below the cliff at the east end of Kemp Town, on the 6th of April, 1855. Also by Mr. F. Bates in September and October, 1854, in an old gravel pit, near Leicester; he found numbers of them concealed in the crevices of the soil several feet below the surface. I believe this to be a perfectly distinct species, and with constant characters which immediately distinguish it from *nitidulum*. Of the whole number of examples (about eighty) taken by Mr. Bates, not one by any means accorded with the latter insect.

Bembidium tibiale, Dufts. Faun. ii. 209 (*Elaphrus*); Dawson, Geod. Brit. p. 191. This species has been found by Mr. F. Bates on the pebbly margins of a brook in Bradgate Park, Leicestershire, and all the examples have (he informs me) a more uniformly brassy tinge than most of the northern specimens, whilst none at all are found to correspond with the cyaneous examples so common in the more mountainous districts. The occurrence of this species in the midland counties has not been previously recorded.

Bembidium obliquum, Sturm, D. F. vi. 160, p. 161; Dawson, Geod. Brit. p. 195, pl. 2, f. E. One example only of this species was to be found in any British collection at the date of the publication of my Monograph, and is therein

recorded and figured; for although it had been included by Stephens among the British species, yet it is well known that it had no representative in his cabinet. During the spring and summer however of the year 1855, it has been discovered by the Rev. H. Clark in considerable numbers on the muddy banks of the Daventry reservoir.

Bembidium Clarkii, Dawson, Geod. Brit. p. 199. I have found this insect in a small willow thicket, near my residence, at various times during the spring of 1855. Dr. Power has found it in Hammersmith marshes, and the Rev. H. Clark on the banks of one of the reservoirs near Daventry, in company with *B. obliquum*, on several occasions during June, July and August, 1855. The first occurrence of the insect recorded is in 1848, but it had been captured many years previously by Dr. Power in the fens of Cambridgeshire, and for twenty years several examples had remained in his collection unnamed and disregarded until the description in the *Geodephaga Britannica* led to its identification.

Bembidium doris, Panz. Faun. 38 (*Carabus*); Dawson, Geod. Brit. p. 203. This species has been found in profusion by Dr. Power and others in an old gravel pit, near "The Five Ways," in Darenth Wood, during the spring of 1855. It has likewise been taken plentifully near Newark by Mr. Hadfield.

J. F. Dawson.

The Woodlands,
Oct. 31*st*, 1855.

COLEOPTERA.

NEW BRITISH SPECIES NOTICED IN 1855.

By E. W. Janson.

1. Dytiscus Lapponicus, Gyll. Ins. Suec. i. 468 (1808).
   Rev. H. Clark, Zool. 4532 (1854), 4850 (1855); by whom four specimens were captured in a small, very deep lake in the Isle of Mull, in September.
2. Hydroporus melanarius, Sturm. Deutschl. Fauna, ix. 59, tab. CCIX. fig. c. C. (1835).
   Rev. H. Clark, Zool. 4531 (1854); taken by him near Oban, in September.
   T. J. Bold, Proc. Tyneside Naturalist's Field Club, Zool. 4823 (1855); Prestwick Carr.
   Rev. H. Clark, Zool. 4863 (1855); Horning Fen, Norfolk.
3. Hydroporus elongatulus, Sturm, Deutschl. Fauna, ix. 52, tab. CCVIII., fig. c. C. (1835).
   T. V. Wollaston, Zool. 4655 (1855); above Hebden Bridge, Midgley Moor, near Halifax, July.
   T. J. Bold, Proc. Tyneside, Nat. Field Club, Zool. 4823 (1855), [erroneously *elongatus*]; Prestwick Carr.
   Rev. H. Clark, Zool. 4864 (1855); Derbyshire, Scotland.
4. Gyrinus celox, Schiödte.
   A. H. Haliday, Proc. Dublin Nat. Hist. Society, June 2, 1855; Nat. Hist. Review, ii. 118 (1855); taken by Mr. Haliday, at Blarney Lake.
5. Homalota cambrica, Wollaston.

T. V. Wollaston, Appendix to Zool. CCV. (1855); North Wales.

6. STENUS ASPHALTINUS, Erich. Gen. et Spec. Staph. 695, 9 (1840).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 138, 6 (1855); Charlton, Kent, apparently very local and scarce.

7. STENUS ATER, Mannerh. Précis d'un Nouvel Arrangement des Brachélytres, 42, 4 (1830), Erich.

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 138, 7 (1855); Greenhithe, Kent, rare.

8. STENUS MORIO, Grav. Mon. Col. Micropt. 230, 10 (1806), Erich.

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc., Lond., n. s. iii. 138, 9 (1855); near Highgate, Middlesex, very rare.

9. STENUS INCRASSATUS, Erich. Käf. d. Mark Brand. i. 541, 13 (1839).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 138, 11 (1855); Wandsworth and Wimbledon Commons, rare.

10. STENUS OPACUS, Erich. Käf. d. Mark Brand. i. 543, 16 (1839).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 139, 15 (1855); North of England? rare.

11. STENUS EXIGUUS. Erich. Gen. et Spec. Staph. 706, 30 (1840).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 139, 17 (1855); Lincolnshire and Ireland.

12. STENUS PROVIDUS, Erich. Käf. d. Mark Brand. i. 546, 19 (1839).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 139, 19 (1855); appears to be widely distributed, but very scarce.

13. Stenus Argus, Grav. Mon. Col. Micropt. 231, 12 (1806), Erich.

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 139, 20 (1855); Lincolnshire, discovered by Mr. Wollaston.

14. Stenus geniculatus, Grav. (*Sten. oculatus, var.*) Mon. Col. Micropt. 228 (1806), Erich.

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 142, 38 (1855); Hampshire, taken by Mr. Wollaston.

15. Stenus flavipes, Erich. Käf. d. Mark Brand. i. 566, 44 (1839).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 142, 39 (1855); London district and Isle of Wight, rare.

16. Stenus fuscicornis, Erich., Gen. et Spec. Staph. 730, 76 (1840).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 142, 40 (1855); Greenhithe, Kent.

17. Stenus latifrons, Erich. Käf. d. Mark Brand. i. 572, 51 (1839).

G. R. Waterhouse and E. W. Janson, Trans. Ent. Soc. Lond., n. s. iii. 142, 47 (1855); apparently excessively rare; the only specimen, with the history of which I am acquainted, was taken brushing on a damp bank near Willesden, Middlesex, on the 7th of June last, by Mr. Edwin Shepherd, Sec. Ent. Soc.

18. Trichopteryx suffocata, Haliday, Proc. Dublin Nat. Hist. Soc. June 2, 1855, Nat. Hist. Review, ii. 123 (1855); "found in October, the larva and perfect insect together, under damp fallen leaves on stones,

in the bed of a dried-up brook (Glen-na-Chatta) of the Shournagh river (Cork)," A. H. H. *loc. cit.*

19. TRICHOPTERYX (?) MOLLIS, Haliday, Proc. Dublin Nat. Hist. Soc. June 2, 1855; Nat. Hist. Review, ii. 123, Tab. III. fig. 7 B. g. (1855); "inhabits sandy sea-coasts, rather rare," A. H. H. *loc. cit.*

20. PTILIUM ANGUSTATUM (*Scaphidium angustatum*, Spence, MSS.), Erich., Naturgesch. d. Ins. Deutchl. iii. 29, 9 (1845).

A. H. Haliday, Proc. Dublin Nat. Hist. Soc., June 2, 1855; Nat. Hist. Review, ii. 122 (1855); Ireland, rare.

21. PTILIUM COARCTATUM, Haliday, Proc. Dublin Nat. Hist. Soc., June 2, 1855; Nat. Hist. Review, ii. 122, Tab. III. fig. 5 (1855); "rare, Holywood."

22. PTILIUM CLANDESTINUM, Haliday, Proc. Dublin Nat. Hist. Soc., June 2, 1855; Nat. Hist. Review, ii. 122, Tab. III. fig. 6 (1865).

"Taken at Holywood. Also in England, J. Curtis. Seems to be very rare, but from its extreme minuteness and pale colour may easily escape observation." A. H. H. *loc. cit.*

23. CRATONYCHUS CASTANIPES, Payk. Faun. Suec. iii. 23, 27 (1800), Erich.

J. W. Douglas, Proc. Ent. Soc. Lond., January 1, 1855; Zool. 4599 (1855).

I am not certain that the insect exhibited by Mr. Douglas is really referable to this species, as I had no opportunity of examining the specimen, which was alive in a phial.

The present species, however, is certainly indigenous; I possess an individual taken last year by Mr. Foxcroft, at Rannoch, Perthshire, and, if I am not mistaken, there were many specimens in the late Mr. Trueman's Sherwood Forest Collection, which was sold by public auction in the autumn of last year. It bears a very close resemblance to *Crat. rufipes*

(*Melanotus fulvipes*, Steph.), with which it may possibly be mixed up in many collections, but from which it may be distinguished by its longer elytra, and the sub-angulated lateral margins of the thorax.

24. Ampedus subcarinatus, Germar, Zeitschrift für die Entomol. v. 177, 39 (1844); E. W. Janson, Trans. Ent. Soc. Lond. n. s. iii. 224 (1855).

Aplotarsus? cothurnatus, Curtis, Trans. Ent. Soc. Lond. n. s. iii. 16, 7, Tab. II. fig. 7 (1854).

Mr. Curtis obtained his specimens from the collection of the late Mr. C. Griesbach, who captured them near Windsor; Mr. G. Guyon has taken it in Richmond Park; Mr. S. Stevens has met with it on Tooting Common, and I have twice found it at Wanstead: it appears to be very rare.

25. Otiorhynchus septentrionis, Herbst.

S. Stevens, Proc. Ent. Soc. London, Nov. 6, 1854, Zool. 4564 (1855); a single specimen in Mr. S. Stevens's cabinet, taken by Mr. Foxcroft in the summer of 1854 at Rannoch, Perthshire; a second individual in the collection of Mr. J. Curtis, captured in Aberdeenshire, in the summer of the same year, by Mr. Peter Elmslie.

Observation.—This is enumerated in my list in last year's Annual, but as the reference to the Zoologist is not only incomplete, but inaccurate, the present is perhaps the readiest mode of setting matters aright.

26. Bostrichus bispinus (Meg.), Ratzeb. Forst. Insect. i. 155, Tab. XIII., fig. 5 (1837).

G. Guyon, Zool. 4815 (1855); Richmond, Surrey.

Bach, in his "Käferfauna für Nord und Mitteldeutschland," p. 129 (1852), observes that he had met with it in prodigious numbers in the stems and branches of *Clematis vitalba* (Traveller's Joy) early in December.

27. Scolytus Ratzeburgii.

Eccoptogaster nov. spec., S. Stevens, Proc. Ent. Soc. Lond., Oct. 2, 1854; Zool. 4515 (1854).

The insect here alluded to, and of which Mr. Stevens had previously submitted a specimen to me for examination, is, I have no doubt, a species hitherto unrecorded as British: it is nearly allied to the species standing in our cabinets as *Scolytus destructor*, but otherwise designated on the continent. As the generic title *Eccoptogaster* was adopted at my suggestion, and as subsequent investigation has convinced me that this name cannot justly be substituted for *Scolytus*, I seize this opportunity of at once rectifying the error, and at the same time of pointing out the differences which exist between the present species and the *Scolytus destructor* of British authors and collections, and of endeavouring to disentangle the synonymy of the two species.

Scolytus, Geoffroy, Hist. Abr. des Ins. i. 309 (1764).* Curtis, Brit. Ent. i., Tab. & Fo. 43 (1824); Steph. Illustr. Mand. iii. 361 (1830), Man. Brit. Col. 205 (1839).

Bostrichus, pt. Fab. Ent. Syst. i. 2, 364 (1792).

Ekkoptogaster, Herbst. Natursyst. v. 125 (1793).

Hylesinus, pt. Fab. Syst. Eleut. ii. 390 (1801).

Ips, pt., Marsham, Ent. Brit. i. 51 (1802).

Coptogaster, Duft. Faun. Aust. iii. 106 (1825).

Eccoptogaster, Gyll. Ins. Suec. iii. 346 (1813); Erich. Archiv f. Naturgesch. 1836, i. 58; Ratzeb. Forst. Ins. i. 184 (1837).

Scolytus Ratzeburgii.

Eccoptogaster Scolytus, Gyll. Ins. Suec. iii. 346 (1813), excl. var. *b*.

Coptogaster scolytus, Duft. Faun. Austr. iii. 106 (1825), excl. var. β.

* Fabricius, nearly half a century subsequent to this [Syst. Eleuth. i. 247 (1801)], applied the name of *Scolytus* to a genus of Geodephagous *Coleoptera*, but for which the generic term, *Omophron*, imposed by Latreille in the following year [Hist. Nat. Crust. et Ins. viii. 278 (1802)], is universally adopted.

Eccoptogaster destructor, Erich. Arch. f. Naturgesch, 1836, i. 58, 1; Ratzeb. Forst. Ins. i. 186, Tab. X., fig. 1—3 (1837), but not of Olivier.

Black, shining. Head deeply strigose, the strigæ converging anteriorly, the interstices forming acute ridges, of which one, the central, is more prominent; thickly, coarsely, and deeply punctured behind and at the sides, clypeus with a broad triangular emargination in front; in the female with a broad shallow depression on the crown, and scantily beset with long depressed fulvous hairs; in the male the upper surface is excavated throughout its entire length, and thickly clad, more especially towards the sides, with a long erect greenish yellow pubescence.

Thorax a little longer than wide, broadest at the base, narrowed in front, rounded at the sides, coarsely and deeply punctate laterally and anteriorly, finely and more sparsely on the disc and posteriorly. Elytra as wide as the thorax, with their sides parallel, the suture depressed throughout its entire length, more strongly so towards the scutellum; the extreme internal apical angle rounded, each with seven rows of deep closely-set punctures, situate in a very shallow stria, and beyond these, at the sides, numerous large, deep, irregularly scattered punctures; the spaces between the striæ are flat and occupied by a single, somewhat disorderly, row of exceedingly minute punctures.

Legs black; thighs narrowly, tibiæ broadly, pitchy-red at the apex; tarsi testaceous.

Abdomen much depressed, the surface of the second segment nearly perpendicular, very sparingly and rather obscurely punctuate, the apical (fifth) segment with a broad deep impression, and with the punctures coarser and a trifle closer. Male with a round glabrous tubercle on the middle of the anterior edge of the third segment, and the anterior margin of the fourth acute, produced and reflexed and

slightly emarginate in the centre. Female with all the segments entire.

This species bears, on a cursory inspection, a very strong resemblance to dark individuals of *Scol. destructor*, from which, however, it may be readily distinguished by its superior size, its deep shining black colour, its narrower thorax, more parallel elytra, with a single row only of punctures on the interstices, and gaping at their extreme apex, the naked head of the female, the great length of the pubescence on that of the male, the more deeply emarginate clypeus, and especially by the structure and puncturing of the abdomen—for in *Scol. destructor* the third and fourth segments have a minute tooth on their anterior margin in both sexes, and the punctures, although fine, are deep and close, particularly on the fifth.

I have seen seven specimens of this insect taken by Mr. Weaver from birch stumps, at Rannoch, Perthshire.

It occurs sparingly throughout Germany, more frequently in mountainous districts, and appears to be confined exclusively to the birch.

Ratzeburg first pointed out the distinctive characters of this species, as shown above; but as I am satisfied it is not the insect described and figured by Olivier, I am under the necessity of imposing a new trivial name, which I have selected in accordance with the course usually pursued in similar cases.

The synonymy of the allied species appears to me to stand thus:—

SCOLYTUS DESTRUCTOR, Oliv.

Le Scolyte, Geoffr. Hist. Abr. des Ins. i. 309, Tab. V. fig. 5 (1764).

Bostrichus Scolytus, Fab. Ent. Syst. i. 2, 364 (1792; Panz. Faun. Ins. Germ. Fas. 15, Tab. 6 (1794).

Ekkoptogaster Scolytus, Herbst. Natursyst. v. 125, 1; Tab. 49, fig. 1 (1793).

Scolytus destructor, Oliv. Ins. iv. 78, 5; Tab. 1, fig. 4 (1795); Curtis, Brit. Ent. i. Tab. and Fo. 43 (1824); Steph. Illustr. Mand. iii. 361, 1 (1830); Man. Brit. Col. 208, 1650 (1839).

Hylesinus Scolytus, Fab. Syst. El. ii. 390, 1 (1801).

Ips Scolytus, Marsh. Ent. Brit. i. 53, 6 (1802).

Eccoptogaster Scolytus, var. b.? Gyll. Ins. Suec. iii. 347 (1813).

Coptogaster scolytus, var. β? Duft. Faun. Austr. iii. 107 (1825).

Eccoptogaster Scolytus, Erich. Archiv. 1836, i. 58, 2; Ratzeb. Forst. Ins. i. 185, Tab. X. fig. 4 (1837).

Common in the south of England on the elm.

28. CORTICARIA BOREALIS, Wollaston, T. V. Wollaston, App. to Zool. CCVI (1855); Coast of Durham.

The following have been incorrectly given as unrecorded British species.

Myrmedonia funesta, Grav., Curtis, Proc. Ent. Soc., Lond. January 1st, 1855; Zool. 4603 (1855), is *Aleochara funesta*, Steph. Illustr. Mand. v. 163, 171 (1832).

Pella funesta, Steph. Man. Brit. Col. 355, 2763 (1839).

Gymnusa brevicollis, Payk. Curtis, Proc. Ent. Soc., Lond., January 1st, 1855; Zool. 4603 (1855), is given by Mr. Stephens, Illustr. Mand. v. 433, 141 *a* (1835), under the name of *Aleochara carnivora*, Grav., and in his Man. Brit. Col. 372, 2930 (1839), where it is said to have been improperly recorded as British. In last year's Annual (1st edit. 90, 2nd edit. 122) I re-introduced it into the list on the authority of Mr. Haliday, Entom. 188, and of Mr. Hardy, Proc. Berwickshire Nat. Club, II., vii. 283. It has since transpired, Proc. Dublin Nat. Hist. Soc., June 2, 1855; Nat. Hist. Review, ii. 118, that Mr. Haliday's insect is referable to *Gymnusa variegata*, Kiesenwetter, Ent. Zeit. Stettin, 6 Jahrg. 1845, 223. Two individuals, captured in Berwickshire, now before me, and which likewise pertain to

variegata, Kies., render it exceedingly probable that Mr. Hardy's specimen is also to be referred to that species. Mr. Curtis's insect is, however, undoubtedly the genuine *brevicollis*, Payk. Eric.

Euryporus picipes, Payk., Curtis, Proc. Ent. Soc., Lond., January 1st, 1855; Zool. p. 4603 (1855), is given by Mr. Stephens, Man. Brit. Col. 389, 3180 (1839), and is represented by Spry and Shuckard, Gen. Brit. Col., del. 17, Tab. 20, fig. 6 (1840). The late Mr. Spry informed me that the figure was made from Mr. Curtis's specimen, to which the remarks in the introduction of their work, p. iv. apply.

Stenus æmulus, Eric., Curtis, Proc. Ent. Soc., Lond., January 1st, 1855; Zool. p. 4604 (1855), is *Stenus niteus*, Kirby, MSS.; Leach, Collect.; Steph. Illustr. Mand. v. 300, 57 (1833); Man. Brit. Col. 411, 3281 (1839), but not of his Collection, as pointed out by Mr. Waterhouse and myself, Trans. Ent. Soc. Lond., n. s., iii. 152 (1855).

Stenus vafellus? Erich.; Curtis, Proc. Ent. Soc. Lond., January 1st, 1855; Zool. p. 4604 (1855), is *Stenus submarginatus*, Kirby, MSS. and Collection; Steph. Illustr. Mand. v. 295, 41 (1833); Man. Brit. Col. 414, 3304 (1839), but not of his Cabinet, as noticed by Mr. Waterhouse and myself, Trans. Ent. Soc. Lond., n. s., iii. 149 (1855).

I have not embodied in the list "*Corticaria cylindrica*, Mnhm (?)"; A. H. Haliday, Proc. Dublin Nat. Hist. Soc., June 2nd, 1855; Nat. Hist. Review, ii. 119 (1855), as some doubt exists whether it is correctly referred to Mannerheim's species, and further, whether it is specifically distinct from *Corticaria borealis*, Wollaston, already enumerated; it is to be hoped that a comparison of specimens will ere long set these doubts at rest.

Mr. Curtis has announced the discovery of "a new genus? of *Staphylinidæ* allied to *Hypocyptus*," reared by

him from the flower heads of *Anthemis cotula*, Proc. Ent. Soc., Lond., January 1st, 1855; Zool. p. 4601 (1855); but he has not yet published the characters, and the very brief and superficial examination which I was able to bestow on the specimen exhibited, precludes me from saying anything positive respecting it. I think it right, however, to observe that it appeared to me not to differ from *Hypocyptus longicornis*, Payk. Erich. Steph.

NOTES ON

ACULEATE HYMENOPTERA,

WITH

A FEW HINTS ON

CAPTURING AND PREPARING SPECIMENS FOR THE CABINET.

By Frederick Smith.

Having been again requested to furnish an annual report of the progress made during the past season, towards a perfect knowledge of the Hymenopterous Fauna of Great Britain, I have much pleasure in recording some very satisfactory results, emanating in part from outdoor research, and in part from an increase of knowledge, acquired by a study of the works of fellow labourers in the same fruitful field.

The success of the Entomologist at the close of any season's campaign, is by no means, at all times, commensurate with the degree of activity and toil he may have brought to bear towards the attainment of wished-for success; nor can even the most experienced Entomologist always account for the great amount of his success, or find any satisfactory cause to which he can assign the destruction of the air-built castles which his fancy had erected.

The past is the twenty-first season of my collecting the aculeate *Hymenoptera;* I look back in vain to find its

parallel in the scarcity of almost the whole aculeate tribe; in my experience, no spring produced so few individuals of the family *Andrenidæ;* spots where these bees usually abound, at their appointed time, were searched in vain; and favourite haunts of some of the wood-boring tribes appeared as if deserted by their usual inhabitants; fields, painted with flowers, seemed to have lost their attractions. A greater paucity of those species, which usually abound in autumn, perhaps is unrecorded; even a wasp with me has proved a rarity; two figures will sum up the entire number which I observed during the season. On inquiry, I learn that some persons have observed wasps' nests, I have seen but one; and during a residence of three weeks on the south-east coast, I did not meet with a dozen of these autumnal marauders. The *Bombi* appeared in very diminished numbers when compared with the season of 1854. The only family, as far as my observation enabled me to estimate, which appeared in increased or unusual abundance, was that of the *Formicidæ;* such were their numbers, in some situations, that they reigned over them in undisputed sway; this was the case on a calm, gloomy, sultry day in the third week of September. Being at Dover, I attempted, accompanied by my family, not only to ascend the celebrated Shakspear's Cliff, but also to take some needful rest when that object was attained; but vain were all attempts to do so, clouds of winged *Myrmicidæ* occupied the summit, and after enduring for some time, with that becoming enthusiasm which ought to animate every fellow-countryman of the immortal bard, we effected a rapid descent, freeing ourselves, as best we might, from the stinging hosts of *Myrmica scabrinodis.*

Great as were the numbers of the *Myrmicidæ,*—for in point of fact the hosts were composed of more than one species, *Myrmica lævinodis* being also observed in some abundance,—they were surpassed by the countless myriads

of *Formica nigra*, which hung like a cloud over the cliffs to the east of the town; thousands upon thousands of these were floating on the sea; in some places, in dark masses, four or five yards in length and breadth, whilst a marginal line, of dead and dying individuals, extended nearly a mile along the shore.

A record of the unusual scarcity or abundance of the insect tribe appears to form a legitimate and necessary part of an annual record; the capture of species of great interest or rarity will, to the philosophical student, appear of secondary interest; and doubtless my coadjutors in the production of the Entomologist's Annual, will have to record the reverse of the picture which I have endeavoured to pourtray; for I believe it always happens, or rather it is an undeviating law, that a season unproductive of one portion of insect life, is adapted to the production of another, in unusual abundance. It only remains to be remarked, that the observation of an individual, in a limited area, may not admit of general application, and observers in other districts will perhaps have to make known an abundance and a success, the reverse of my own experience.

It is one of the disadvantages under which the Hymenopterist labours in this country, that the number of students are so limited; this seems truly surprising, since it must be admitted, that the most generally attractive and the most remarkable records in the history of insect life are to be found in the works of Reaumur, the Hubers, Latreille and Kirby and Spence, upon the order *Hymenoptera*. The small number of Hymenopterists also operates greatly against the chance of his acquiring novelties from working collectors, who visit remote or little frequented parts of the country. Not a season passes in which, through the exertions of these men, the Coleopterist and Lepidopterist do not add species new to the English *Fauna*, and not unfrequently species even

new to science. Notwithstanding these disadvantages, which have hitherto operated so prejudicially, it is cheering to record that since the publication of last year's Annual *the number of students in this department has increased*, and it is to one of the youngest labourers in this interesting field that I am indebted for the first insect with which I commence the list of recent discoveries. In my Essay on the British *Formicidæ*, I described a species of the Genus *Tapinoma*, of Foerster; this insect was previously unknown as British, the sexes described were the worker and male. During the past season Mr. Frederick Grant, jun., discovered two nests of *Tapinoma erratica;* to him I am indebted for a number of examples of the worker and the only two females which he captured. Mr. Grant left this country too early in the season to procure the winged individuals from the *formicarium;* one of the colonies was found in Coomb Wood, the other at Weybridge, Surrey; this shows that the species is scattered and only wants hunting for. I confidently anticipate the discovery of several of the species of *Formicidæ* found abundantly on the Continent, and very widely distributed. On the last occasion of Mr. Grant's visiting the colony of *Tapinoma*, at Coomb Wood, the males and females were in the pupa state, spun up in silken cocoons.

Myrmica lævinodis I found in great abundance at Deal, and along the coast at different points between that place and Dover; at the latter it was very plentiful; Mr. Baly found it at Folkestone: it appears to be quite as abundant as *M. scabrinodes* along the south-eastern coast; it has not, to my knowledge, occurred in the vicinity of the metropolis.

Pompilus rufipes; this beautiful insect is not uncommon at Deal during the month of September. I captured not only the varieties mentioned in Shuckard's Essay, but also examples, with all the legs black, and the usual white spots entirely wanting on the abdomen; the latter variety occurs

in the males. The first pair of white spots at the base of the second segment are, however, frequently obliterated in the females; in these individuals the posterior legs are sometimes entirely black.

Pompilus pectinipes. This hitherto rare species is not uncommon at Deal; the female only was known when Shuckard described the species under the name of *P. crassicornis.* Both sexes are very much like those of *P. gibbus,* the female being principally distinguished by the thickness of the antennæ; but possessing a series, other characters present themselves,—the metathorax has a less deeply impressed central channel, is less abruptly truncated, and is always covered with a fine silky pile. The male has the antennæ proportionably longer than the same sex of *P. gibbus,* and they are even more incrassate than in the female.

Pompilus variabilis. I discovered an example of this species mixed up with the series of *P. rufipes* in the collection at the British Museum; the label attached bears a number in red ink, forming part of a series of *Hymenoptera,* I believe from South Wales. This I think highly probable, it being a most abundant insect in most parts of Europe. It occurs in Italy, France, Germany, Spain, Portugal, Saxony, Sweden and Denmark. I have therefore little doubt that future captures will confirm my opinion of its being an indigenous insect.

Pompilus notatus. We are indebted to Wesmael for pointing out good and distinctive characters whereby to distinguish this species from *P. exaltatus,* which at first sight it greatly resembles. Wesmael is the only Entomologist who has described the female. I captured a single example of this sex at Deal, last September; there is also one in the British Cabinet at the British Museum. The most obvious distinction between the two species is, that that part of the externo-medial nervure which crosses the base of the first

sub-marginal and second discoidal cells, in *P. notatus*, forms a slightly bent arch; in *P. exaltatus* that portion of the nervure forms a double arch; or, one across the base of each cell. It is quite probable that *P. notatus* exists in British collections, mixed with *P. exaltatus*. The above character will serve to separate them.

Ammophila lutaria. This rare or very local species is to be met with at Deal. I captured both sexes there last September.

Astata stigma. In the year 1846 I captured a single specimen of the female of this species; since that time I was unable to discover a second example; last September, I took another female at Deal. August is the month, during which our other British species is usually to be found—the *Astata boops*. In all probability *A. stigma* will be captured at Deal during that month in some ensuing season; the spot where the first example was found at Weybridge is now a plantation of fir trees.

Oxybelus ferox. I received some specimens of *Oxybelus mucronatus* from France. The *O. ferox*, Shuck., proves to be the male of that species, with which the *O. argentatus*, of Curtis, is also synonymous; this not only appears evident on a comparison of specimens, but the detailed and accurate descriptions of Dahlbom and Wesmael confirm it.

Crabro lituratus, Panz. I took a specimen of this species at Deal, last September, also one of *Crabro sex-cinctus*, Fabr.; the former is a female, the latter a male; I have hitherto regarded the *C. sex-cinctus* as a variety of the male of *C. cephalotes;* and in a Catalogue, published in 1851, I reduced *C. cephalotes* to a synonyme; my recent captures induce me to consider this an error; indeed I am further led to adopt this opinion, having since that period received M. Wesmael's valuable Essay from the author, in which he indicates my present opinion.

Trypoxylon aurifrons, Shuck. This species proves to be a Brazilian insect, Mr. H. W. Bates has taken several specimens at Santarem.

Mimesa Dahlbomi, Wesm. This species has not hitherto been recorded as a British insect; it closely resembles the *M. unicolor* of Vanderlinden, but it is at once distinguished by the form of the apical segment of the abdomen, which, above, forms an elongated triangle margined at the sides, very smooth and shining, and with a few scattered punctures; in *M. unicolor* it is cylindric, and not margined at the sides. I discovered a specimen amongst the series of *M. unicolor* in the Stephensian Collection; I have little doubt it will be found in plenty, if the black species of the *Crabronidæ* are diligently collected.

Nomada borealis. I described this species in the Zoologist under the name *Nomada inquilina*, not being aware that it had been previously named by Zetterstedt; the description of that author is very decisive as to the identity of our species, but all doubts have been removed by Dr. Nylander's sending me specimens of the Lapland insect. In the London district the species appears to be rare; eight or ten years ago I took half a dozen at Hampstead, and one or two of what I had little doubt was the male; since that time I lost sight of it until the present season, when I captured a single specimen. In the north it proves to be abundant; Mr. Bold and also Mr. Wailes, of Newcastle, have this year taken it in plenty.

Bombus lapidarius. There are few species of our humble-bees so abundant as this insect, it is plentiful in all parts of the kingdom; at Southend it abounds. During the twenty years that I have collected the *Bombi* and investigated their habits, I have not met with more than twenty couples *in coitu*, and I never observed this in *B. lapidarius* until the present season, when I obtained a pair at Deal; the

male is the one usually assigned to the species by all authors; Kirby once observed the male entering the nest; no doubt was entertained upon the subject, but such records have their value, they confirm previous opinion and place the matter beyond a doubt.

On examining the series of specimens of *Cerceris sabulosa* I was much pleased to discover four examples from Devonshire, presented to the Museum by Dr. Leach, numbered by himself, and agreeing with the List entered in the Register; these specimens prove to be a species new to Britain—*Cerceris emarginata*—a species which occurs in France and Germany.

Little more remains to be added on the score of novelties, except to record the capture of a male of *Tenthredo cingulata*. I am acquainted with no species of the genus *Tenthredo* which is usually more abundant than *T. cingulata*; when the fern shoots up a few inches above ground, this insect may be observed settling on the young plants; capture some—they are all females! I have swept large tracts of ground where the insect abounded, scores have fallen into my net, all females! What are the habits of the males and where are they to be found? This question has presented itself to me many a time; I have hunted for them before the young fern was an inch above ground, when not a female could be found; a little later—when the females abounded; and again, when they had disappeared; I have sought adjoining localities, hoping to find the males attracted by flowers, all was vain research, year after year. In the beginning of last May, I took a single example of the male, at Southgate, settling on the young fern-heads. Is it, that this sex is as one to a thousand females? I have almost been led to entertain an opinion similar to that which at present exists respecting the genus *Cynips: Cynips* has no males! The same opinion may almost be pardoned should it be promulgated of *Tenthredo*

cingulata; during a diligent search of twenty years, I captured *one!* I am not prepared to deny the above position, but I cannot accept it without *some* doubt; I am prepared to take another course, that is, to test it; the result I hope to make known on a future occasion.

INSTRUCTIONS IN

COLLECTING

THE ACULEATE HYMENOPTERA.

By Frederick Smith.

It has been suggested to me that a few words of advice upon this subject would be acceptable. My own method I am most willing to make known; but it is always best in these matters to begin at the beginning; this is left out of the request which lies before me—"*First catch your hare:*" this suggests the important question, *Where shall I find one?* a very important item, and upon the attainment of such knowledge greatly depends the success of the Hymenopterist.

"Where there are flowers, there will be bees:" to this, as a general rule, I assent; but it is not to these situations I would lead the young Hymenopterist. If while collecting it is your aim to acquire a knowledge of the species, seek for the *habitations* of the bees. In spring the *Andrenidæ* are the first that appear; at this season search carefully sandy banks, hedge rows and sunny slopes; the little hillocks turned up by the bees on issuing forth from their hybernaculum cannot escape your notice: for some days, males only will be observed, these will in all probability be found on the nearest flowers, if not observed on their first issuing from the burrows; revisit such spots a few days after securing the males, and in all probability the females will be obtained; great care should be taken to attach some mark

whereby all chance of mistake may be obviated; it is of course advisable in some cases to dig out the females when the males are seen hovering about the fresh turned hillocks. It is only by carefully observing colonies of the different species, that a knowledge of their parasites can be obtained. Great numbers of *Andrenidæ* will be found on Sallow catkins, particularly males, but by these means *nothing is learnt;* a multitude of specimens will be accumulated, *but no knowledge of the species acquired:* by practising the method above recommended of searching for the colonies of bees, and there securing the sexes, immense advantage will be obtained and the labour of naming the species reduced by at least one-half.

Of one or two genera of the *Andrenidæ*, the young collector may spare himself the trouble of looking for more than one sex in the spring; these are *Sphecodes* and *Halictus;* of these, the females only will be found until the end of summer and during the autumn, when the males will be found in plenty, and will continue to be so even after the other sex has passed away; for the history of these bees I must refer the student to my book on the Bees of Great Britain. I would recommend, as regards the wood-boring bees, to notice situations where they are plentiful, forming their nests in posts, rails, &c.; the following spring it is advisable to procure portions of such wood as they have burrowed into—this secures the certainty of obtaining the sexes of the species, and of such parasites as they may be infested by. The same plans which I recommend for adoption in collecting bees, will also apply to the Fossorial tribe, but in some respects the time for capturing the rarer species is different; bees should be looked for betimes in the morning, between the hours of eight and twelve, and this, when the weather is moist and calm; a west, or south-west wind, is most desirable. Some of the fossorial genera, *Methoca*, *Mustilla*,

Tachytes and *Astata*, are truly lovers of sunshine; and are to be found only, when the heat of the sun is so great that bees retreat to shady spots, or retire to their burrows until the heat of midday is past; many of the species are difficult to secure, their flight is a dart, and nothing but practice, a quick eye, and a steady hand, can make sure of them. When your hunting-ground is not at too great a distance, *walk to it;* much may frequently be picked up by the way; it also obviates a very tormenting uncertainty, sure to befall the railway traveller on the way to his field of action; railway banks are frequently covered with flowers, and as surely they are frequented by insects: who has not caught sight of magnificent new species as he was whisked along in the train—without the possibility of clearing up the uncertainty by stopping a moment to capture the treasure? but let every one thank his stars that he lives in railway times, when the New Forest is to be reached, from London, by the time one can raise one's eyes from the attractive pages of a single number of "The Newcomes."

With these few hints as to the time when, and the place where, certain genera are to be found, I must hasten to give a few words of advice, *how to capture* Hymenopterous insects, and how to prepare them for cabinet specimens. The only net really necessary is a bag-net, sugar-loaf shaped, made of fine *white net*, green gauze is frequently used, I have long discarded it—many of the rare minute black species are sure to be lost by the use of it; in a white net nothing escapes the eye, therefore never use a *green one*. The net should be attached to an iron folding-ring, such as is used for a landing-net; the thinner the better, that is to say, have it filed down between the joints to give it lightness; Messrs. Downie and Foxcroft both know how to make them; never have a net of this kind fixed to the stick or handle by a screw; if you do, depend upon it, it will twist round pre-

cisely at the moment when you feel secure of your game and are striking at it; my ring has an oblong piece, filed square at the sides, which drops into a brass-socket at the end of the stick, and is secured by a spring with a short pin at the end, which drops into the square piece at the side of the ring; this is secure and never fails to answer the purpose.

Generally speaking, I do not recommend the use of bruised laurel in a bottle, with blotting-paper to absorb the superfluous moisture; but for some species, and on some occasions, it is desirable and indispensable.

Never put Humble-bees, or any pubescent *Hymenoptera*, in bottles of laurel, ten to one all your day's collecting will be entirely spoilt; the beautiful pubescence of these insects gets wetted and matted together, then the specimens are useless. Always carry a good supply of pill-boxes, and never put more than a single insect in one box. After the day's collecting, kill the insects with sulphur; the best way is to open the boxes a little on one side, by sticking the lid on obliquely; then pile up a number and place a bell-glass over them, take a little powdered sulphur on a flat piece of stick, light it and put it under the edge of the glass; it is desirable to repeat this a second time, at an interval of an hour or so; then leave them until the next morning, when they will be in capital condition for setting.

A well set bee is a beautiful object, it is then fitted for the cabinet, or for the purposes of examination or description; every part of it can then be seen; of each species it is very desirable to extract, when specimens are plentiful, or if rare, to push forward, the tongue, so that this important organ may be carefully examined, and the genus to which it belongs ascertained; this applies more particularly to the bees; the determination of the genera of the fossorial tribe has hitherto been principally determined by the neuration of the wings. The best method of *setting* a bee, in my opinion, is

as follows: run a pin through the thorax, in the middle between the wings, then take a setting-board covered with cork, not too thinly, if half an inch thick so much the better; run the pin into the cork until the breast of the bee nearly touches it, then, with a needle or fine pair of forceps, arrange the legs in a natural manner; on each side of the bee, place a table-brace on a level with the wings, the table-brace is to be made of thick card-board, cut into an oblong form, a pin being stuck through one end, so that the card stands in an horizontal position, table-wise; on these tables the wings must be spread with care, each pair being united at their edge by the minute hooks which secure them naturally; having placed them in a natural, or we may say, flying position, they are to be so secured by another pair of braces, which must be securely pressed upon them. A little practice will soon overcome all difficulties: a collection well set, in the manner pointed out (I hope intelligibly), is worth a pilgrimage to look at.

It will be found impossible sometimes, when visiting localities for a few days, to set insects; in these cases I use the laurel bottle to keep my specimens in after being killed; I usually prefer placing a few in different pill boxes, and drop them into a wide-mouthed bottle, one-third filled with bruised laurel; if left in it for a few days they will set tolerably well; but such specimens are apt to relax, particularly in damp weather; when practicable, *always collect in pill boxes and kill with sulphur.*

If I have omitted anything which it would be desirable to communicate, it is in the fear that I have already been too prolix; I shall therefore conclude with a few words on the supposed danger to which the Hymenopterist is exposed from the stings of his favourites; with a little practice in the *handling* of Bees and Wasps, it is an easy matter to capture any of them without the least chance of being stung;

nine-tenths of my captures are made with the fingers; when unlucky enough to be stung, I find the best cure is made by wetting the spot and rubbing it well with a little salt; if the wound is on the hand, no better way can be adopted than that of well sucking the part, the pain will soon be over.

RESULTS

OF

A RESIDENCE AT FOCHABERS.

By John Scott.

It was in the early part of last year that I wrote to Mr. Stainton and some few other of my correspondents of my intended visit to this place for some time on "pressing business." This of course brought in a host of "wish-you-may-be-successfuls"—"new era in Entomology"—"glad to learn something of a new locality"—"do you take fossores, bees, ichneumons, spiders, aphides," &c., &c.? and had I been a very giant in the science, and with no other thing to attend to, my kind friends had cut out as much work for me daily as would have served from sunrise till long after the setting of that luminary; not but that I wished to serve them all—but I could not. The time came for my starting, and at last found me "settled down" in a railway carriage, in which I spent eight hours in a great many ways, concluding the whole by going to sleep. About five o'clock in the morning the guard awoke me with a shake—"Aberdeen, Sir!" A sudden start, a yawn, a hasty gathering of rugs and other traps, luggage cared for, and all the paraphernalia requisite for a few months stay stowed on and in a crazy cab, and I was jolted away to the "Royal," there to "hang out" for two hours, until the "Defiance, fast four-horse coach," should start for Fochabers. I was shown into the commercial room

of course, and what a cold look it had that spring morning! No fire, except a single gaslight just turned on, by which you might discern through the dimness that the walls were ornamented with sea views, landscapes, medallions of painters and a huge Britannia, her anchor and lion enjoying the space over the mantelpiece. To go to bed was out of the question, so I threw myself down on a sofa all of a shiver, and I remember, whilst I lay half asleep, opening my eyes very wide and wondering whether Britannia had crept there for warmth. Rembrandt, Jameson, Titian, Paul Veronese, Volterra (at least they were named thus), and several others, seemed to have their eyes all directed to where she was seated, no doubt longing to be of the party, especially poor Wilkie, who looked "very blue" from cold. But I dozed off amidst confused ideas of having Britannia opposite to me enjoying the luxury of a first-class carriage, some of the painters taking out a ticket for the lion, and two or three others making sundry futile attempts to dispose of the anchor. I am sure I had not been as I thought more than ten minutes asleep, until another shake, and a voice announced to me my time was up. I mounted the roof—the horn sounded—and after seven hours "heavy work" I was set down at the "Gordon Arms."

What a conspicuous part this sign plays throughout the whole of this district; scarcely a town or village but has its "Gordon Arms," and that of course leads to the 92nd Highlanders. There is Mr. So-and-So, vintner, late of that regiment—perhaps a piper.

What a beautiful piece of country surrounds this clean but quaint looking village. Were it not for the mountains up the Strath one might fancy oneself in the very heart of "merrie England." The mountains are a long distance off, and the interval is filled up, not with great heaths, things of such common occurrence in the north, but with richly cul-

tivated land. Looking up the Strath from the west end of the village, the view being bounded by the river Spey on the south side, the eye first rests upon a piece of table-land nearly encircled by a belt of trees. This belt is about two miles distant, and from that point until the view is abruptly choked by a huge mountain, the ground gradually rises, exposing as beautiful and varied a piece of country as we could see anywhere, its face bedecked with cottages and steadings occasionally set in a clump of trees. These start forth, now here, now there, until they become mere specks in the distance—now they are lost altogether, and the only evidence whereby they are to be detected is the pale smoke resting amongst the foliage in which they are buried. Then again further up this rising ground, now becoming part of the mountain, such singular gaps are made in the woods which cover it, and these gaps were crowned with corn—waving, waving on, like a mimic sea—now dark—now light, then dark again. Then between these mountains to the left runs the Spey, and at intervals up and down its shores may be seen groups of men, each group comprising seven, engaged in salmon fishing. Now they walk in single file and drag after them, up the water, a boat; now the net is cast off, and now they are all anxiety to haul it to land. A rap on the head is the reward of each fish floundering about in the net, which are then thrown on shore. The net is next gathered into the boat and the same process goes on by day and night for the few months that the fishing lasts. This is one of the most rapid flowing rivers to be found anywhere. It rushes down in its quiet moments at a sort of mail-coach pace (the descent in the last five miles being about seventy feet); and as its bed is composed of a very coarse loose gravel, it keeps continually on the move, and in many places has turned the windings at right angles to each other. It is not navigable, upward at any rate, but large rafts of home-grown timber

come down it some sixty miles or so; and to see these rafts chasing each other down, one is very easily reminded of Cooper's novels, emigration, Henry Russell's lectures, and American life in all its phases.

Then as we look eastward through the village, a hill heavily crowned with Scotch fir also completely blocks the view; and so black and dark this hill always looked to me, even in brightest sunshine, that it cast quite a melancholy over the scene;* and if we wander round its base by the great north road, we observe a great yawning distorted rift entirely dividing the hills, and down it in rainy seasons the water rushes rapidly, discharging itself into the Spey. This is called the Burn of Fochabers; and as we still wander on, in all directions is to be seen these curious zigzag rifts terminating in the first named one. The sections show that these rifts are composed of red sand and pebbles,—a kind of uncemented conglomerate. When the sun shines full upon them they produce a very brilliant effect, and the foreshortening of shadows give to the places over which they fall a strange and undefinable appearance. It had quite a charm for me to get up here of an evening and watch the clouds veil the shadows, now thrusting themselves down into the lowest crevices—in an instant at the top of them, and then as suddenly bounding away and spreading out as they receded until they topped the hills and disappeared altogether. Happiness seemed to have her throne here—everything was so peaceful; and that strange sensation which creeps over

* In the wood which covers this hill are two or three large patches of a scarce plant (*Linnæa borealis*). I searched very carefully for larvæ upon it, but without meeting with any; still it is my conviction, that something good might be detected feeding upon it. These patches are not easily found, and I cannot describe their exact position here; but I believe, were any one visiting this place and asking Mr. Webster (mentioned at p. 113), he would have much pleasure in directing him to them. He is exceedingly kind and obliging.

every one who gets lost in his contemplation of the sublime was ever present—

> That undefined and mingled hum,
> Voice of the desert, never dumb,

stealing over all, now louder, now softer, and just as we think it dying away altogether, it bursts forth again with such a swell that he must indeed walk inconsiderately who does not listen in mute wonder. For yards round the tops of the trees we may hear and see the merry throng of gnats, they are so numerous. Then the grasshopper chirrups forth its part. Some wandering *Bombus* too sweeps by with deeper note, and deeper still a *Stercorarius* completes the harmony. And—

> "Whether we look, or whether we listen,
> We hear life murmur or see it glisten:
> Every clod feels a stir of might,
> An instinct within it that reaches and towers,
> And, grasping blindly above it for light,
> Climbs to a soul in grass and flowers.
> The cowslip startles in meadows green,
> The buttercup catches the sun in its chalice,
> And there's never a leaf or a blade too mean
> To be some happy creature's palace."

My time for Entomologising was so limited, that I worked this locality but very indifferently, nor could I round about find any one who had done anything towards its natural history in this branch. I am quite satisfied, however, that, patience and care bestowed rightly in this district, it would be found to rank with Rannoch. Amongst my captures I enumerate a few of the scarcer species.

Pœcilocampa Populi. Larvæ very abundant on alders in May.

Phragmatobia fuliginosa. Larvæ common in April; imago in May.

Ceropacha flavicornis. On trunks and branches of trees, March.

Triphæna orbona. A curious variety, the pupa of which found by me beneath a stone at the side of Fochabers Burn. See "Zoologist," p. 4674.

Noctua depuncta. A single specimen beat from a tree on the grounds of Gordon Castle.

Chersotis agathina. Pupa beneath the same stone as *T. orbona.*

Spælotis præcox. Plentiful on wall leading to the bridge; August.

Trachea piniperda. Scarce.

Hadena Æthiops. Common on walls and fences.

Pyrausta cingulalis. Common; July.

Hydrocampa potomogalis. Very abundant; July.

Macaria lituraria. Common; June.

Biston betularia. A single example; June.

Peronea Caledoniana. Common; August.

Retinia duplana, Hüb. (see *ante,* p. 34). I was first led to observe this species from a pupa brought me on 21st of April by Mr. Webster, the Duke of Richmond's gardener. It was made in the heart of a bud of Scotch fir; the perfect insect came forth 7th of May. I afterwards beat it out of fir trees.

Retinia resinana. A single specimen beat from firs.

Mixodia palustrana. Plentiful; May.

Micropteryx purpurella
unimaculella
Sparmanella
subpurpurella
} Common on palings, near birches, in April.

Gelechia Hübneri. A single specimen, on the bridge fence; April.

Tinagma resplendellum. Two specimens, at rest on the

leaves of the *Carex*, in which were the larvæ of *E. Kilmunella*; June.

Gracilaria elongella. Abundant in April.

tringipennella. Larva very common on *Plantago lanceolata*, in April.

Coriscium sulphurellum. A single specimen on the trunk of an elm; April.

Coleophora viminetella. Larvæ abundant on *Myrica Gale*, in June.

Chauliodus Chærophyllellus. Exceedingly common in the larva state in July.

Argyresthia conjugella. Bred from larvæ in mountain-ash berries. See *ante*, p. 54.

Lithocolletis Vacciniella. For a description see Entomologist's Annual for 1855, 2nd edit., p. 70.

Aucupariella, n. s. Bred freely from mountain-ash leaves, in July.

Frölichiella. Common amongst alders,—bred from alder leaves.

Dunningiella. Common amongst alders.

Stettinensis. Common amongst alders, in April.

Klemannella. Common amongst alders, in April.

Chrysoclista Schranckella. Common in the larva state in May.

Elachista Kilmunella. For a description of its habits, &c., see Entomologist's Annual for 1855, 2nd edit., p. 78.

zonariella. Larva common in *Aira cæspitosa*, in July, in a quarry on Dipple Farm.

ON THE

OBJECTS OF A COLLECTION OF INSECTS.

By John Lubbock.

The present has been called the age of insects; this century at least might be called the age of collections of insects, and not of insects only, for we have collections of almost everything, of shells and stuffed birds, of ferns and flowers, of grasses and coins, of autographs and old china, of Assyrian marbles and even of postage stamps. Mr. Darwin once expressed to me his surprise that he had never met with any one who collected odd-shaped biscuits; and though the idea seems at first sight quite ludicrous, yet a collection of the biscuits of different nations would possess many more points of interest than can be found in postage stamps. *I do not wish to underrate collections.* I am quite aware that without them, there could be no more Entomology, than there could be science without books; but, on the other hand, a collection of insects which is not studied is of as little real use as books which are not read.

I do not think these remarks will be considered uncalled for; undoubtedly the popular idea of an Entomologist is a person who *collects* and not one who *studies* insects. Indeed few seem to consider that there can be anything to study in these little animals. A small Geneva watch is considered interesting, because the machinery is so delicate; but what shall we say then of a beetle, which, though no larger than

a pin's head, can see, taste, touch and probably hear (which may possibly enjoy a sense of the very nature of which we know nothing)—which having eaten a little sugar turns it into chitine, blood and nerves, to say nothing of four wings, six legs, many hundred muscles and several thousand eyes, and which, more than all, produces a number of little balls, each of which will in due time, after various changes, produce a beetle like the first? This, forsooth, is interesting no doubt to "collectors," but unworthy of the notice of sensible people because the insect is so small!

Perhaps, however, even Entomologists themselves have given too much time to collecting, and paid too little attention to the habits, anatomy and physiology of insects. I find that in the last four volumes of the Transactions of the Entomological Society, 818 pages are devoted solely to descriptions of species and genera, while all the other departments of the science occupy only 244, of which 208 treat of the habits of insects, and there is not a single paper on physiology or internal anatomy. This must not be considered as an epitome of *all* that our Entomologists have done in the last thirteen years. Some of the most interesting Entomological papers, those of Newport for instance, have been published in the Philosophical Transactions, or in other works.

This want of attention to the habits, anatomy and physiology of insects, is the more to be regretted, because I fear we must confess that to make collections the end, instead of the means, to collect merely for the sake of collecting, has a direct tendency to narrow the mind. To aspire only to be able to say that one has in one's cabinet a certain number of species, or some rare sorts which nobody else possesses, is surely an ambition quite unworthy of a true Entomologist.

Yet without collections there could be very little Entomology; the comparative anatomist, the physiologist or the

field naturalist, equally requires them to refer to, that he may know the name of the animal he studies, and so be able to give to others the benefit of his observations. Some nearly allied species so closely resemble one another, that without specimens it would be extremely difficult, if not impossible, to distinguish them; others again, whether from an inherent tendency to "sport," or from the influence of external circumstances, vary so much in different examples that, without comparing a series of specimens, the more extreme forms of one and the same species would often be described as different species, or even placed in different genera, as has been too often the case. To describe species so that they may be recognised by other observers, is an art much more difficult than would *à priori* be expected; for it must be remembered that to distinguish them from the old species is not sufficient—they ought to be so described that they may be known from those also that will afterwards be discovered; and it is much to be wished that every describer of a new species would deposit one or more specimens in the British Museum and the cabinet of the Entomological Society. If this had been always done many mistakes and much confusion would have been avoided.

Collecting, however, even if we proceed no further, has of itself *some* good effects upon the mind, which must not be undervalued. The close and accurate observation of Nature most forcibly induces that frame of mind so beautifully described by Shakspeare, in which we are disposed to find—

> "Books in the running brooks,
> Sermons in stones, and good in everything."

To those who take no interest in science it would be difficult to explain the feeling with which a Geologist regards a rock, a Botanist a flower, or an Entomologist an insect: it is something quite peculiar, and can only be understood and

appreciated by those who have passed from ignorance to knowledge, and have felt how *immeasurably* their enjoyment of life has been heightened, as they have become better able to appreciate the wonderful works of God.

The connexion between different sciences is always very interesting, and that between Zoology, Physical Geography and Geology is no exception to the rule. Lists of species have long been used as excellent tests of the age of deposits found in different parts of the world, and the labours of Professor Edward Forbes have made known to us that interesting evidence on the geography of ancient times may be obtained in the same way from a careful examination of lists of species. In his paper on the "Geological Relations of the existing Fauna and Flora of the British Isles," he shows that out of sixty-five species of testaceous molluscs which are common to the coasts of the United States and of Europe, fifty-one are known as glacial fossils. Of the remaining fourteen, two are pelagic wandering mollusca; one Teredo Navalis is carried about in floating wood, two are small species living in stony ground, near high-water mark, and therefore not likely to be found fossil: three are Chitons, which fall to pieces soon after death, two are doubtful, and the other four may very probably yet be found fossil. The inference which Professor Forbes draws from these facts is, that "not a single littoral or coast-inhabiting mollusc has found its way across the Atlantic, in either direction, since that ancient time, anterior to all human records, and probably long anterior to the appearance of man on our earth, when an Arctic Sea, inhabited by a limited and uniform fauna, extended from the then western coasts of Siberia into the heart of North America, and southwards in Europe to the parallel of the Severn, and in America to near that of the Ohio.....There could not then have been such a separating abyss between Northern

Europe and Boreal America as now divides them; the sea, through a great part, must have been a shallow sea, and somewhere, probably far to the north, there must have been either a connexion or such a proximity of land as would account for the transmission of a non-migratory terrestrial and a littoral marine flora."

This does not strictly apply to Entomology, but it has long been known that the summits of various mountains in Europe, which agree in the vegetation, have also certain insects in common which are not found in the surrounding countries. The fact of a very cold period having immediately preceded the present, offers us apparently an explanation of the fact, which, again, on the other hand, may be considered to give us additional evidence of the truth of the theory. For it is clear, that if the temperature of the plains were then much lower than it is now, the little creatures in question may have peopled the whole country, while, as the climate grew gradually milder, they were driven up by degrees, until at length they only remained on the summits where we now find them.

So far all is very clear and satisfactory; but another explanation of the fact may be given.

Thus Mr. Newman writes me word that,

"Helobia nivalis ? brevicollis,
"Agabus Snowdonius ? bipustulatus,
"Leistus montanus ? fulvibarbis,
"Steropus Æthiops ? madidus,
"Patrobus septentrionis? rufipes,

"and others, occur on the summits of Snowden, Helvellyn, Ben Nevis, and other mountains; but some eminent Coleopterists regard these mountain insects as merely depauperated forms of the commoner species whose names I have placed in juxtaposition: certain it is that the Alpine species never exists on the summit unless the corresponding

Agrarian species, which in every case is most familiar, abounds on the ascent and especially in the valleys." This is not the place to investigate the question, but I have indicated it as one which can only be decided by a careful examination of a series of specimens judiciously collected.

Mr. Wollaston in his excellent work, which cannot be too highly praised, on the Insects of Madeira, informs us, that out of four hundred and eighty-two species of *Coleoptera* occurring in that group of islands, two hundred and one are also found in Europe. To account for this we must suppose one of two things, either that the two hundred and one species of insects have been introduced by accident, as by man or by winds, or some similar cause; or else that these species have been in existence ever since the time when Madeira formed part of the great continent. The latter supposition will certainly be preferred by all who have studied the great changes which have taken place in the distribution of sea and land even in the most recent geological period.

Similar reasoning will hereafter afford us curious evidence of the relative antiquity of different species and of former geography, but it is extremely difficult and must be used with the greatest caution.

For if the immense number of the species of insects has hitherto prevented Entomology from bearing much fruit of this nature, it, on the other hand, holds out the promise of an abundant harvest in future; and, when we shall have correct and complete lists of the insects of different countries, the results cannot fail to be extremely interesting.

The collections of insects now being formed are great storehouses of facts, which ere long some future Humboldt or Edward Forbes will turn to good account, and from which he will perhaps draw conclusions, the nature of which we cannot at present conjecture.

It must, however, be remembered that such reasoning assumes as an undoubted fact that each species had a single centre of creation from which it has radiated. But, although Professor Forbes takes this for granted, it has confessedly never been proved, and is one of those difficult questions, which, while they add so much to the interest of natural history exclude it from among the number of the exact sciences.

Some, perhaps, of those who read the preceding remarks will ask, What is the *use* of Entomology? These I would ask to consider what they mean by *use;* they will, I think, find, though they may not like to confess it, that their idea of a useful thing is,—a thing which can be turned into money. But money itself is only valuable in as far as it contributes to happiness, whether bodily or mental; and even if the tendency to health, which is given by the regular habits, temperance and industry, without which no one can be an Entomologist, are to be considered of no value; still the constant interest without anxiety or disappointment, the gentle exertion without overstraining the mind, and the contemplation of the universal beneficence of the Creator even towards the smallest of his creatures, can hardly fail to bring a peaceful happiness to the mind which none but a philosopher can appreciate, and even he cannot describe. If indeed he could, there would be scarcely any that were not Naturalists, instead of so few that are.

If this argument be not enough, I will conclude with a short sentence from one of our greatest philosophers: "Whatever it has been worth God's while to create, it must be worth man's while to study."

GHENT TO GLOGAU

AND

STETTIN TO SCHAFFHAUSEN

IN SEARCH OF ENTOMOLOGISTS.

(By the Editor.)

On the 19th of May, 1855, we left Ghent; our destination was Glogau, there to visit in his own domicile the illustrious Professor of Micro-Lepidopterology, whose writings in the Isis and Linnæa have caused so complete a revolution in the study of that branch of science, and who has more pupils scattered over Europe than many a Grecian philosopher could boast of. Though our object was to get to Glogau, we had no objection to stop, or turn out of our course a little, in order to meet with other Entomologists.

Well! as already mentioned, we left Ghent on the 19th of May at an early hour, and, arriving at Cologne in the afternoon, took up our quarters at the Hôtel de Belle Vue, at Deutz; as we remained there a whole day I looked about to see if any of my old friends were located on the banks of the Rhine, and found larvæ of *Coleophora fuscedinella* on birch, and of *C. viminetella* and *Depressaria conterminella*. On the morning of the 21st we were off at an early hour, and at midday arrived at Hanover (or Hannover as they spell it there, and I suppose they know best how to spell it); here we were met by Herr Dohrn, the President of the Entomological Society of Stettin, and as soon as dinner was disposed of, I went to call on Herr Krösmann, of whose

very existence I had previously had no definite notion, though aware that Herrich-Schäffer had a *Gelechia Krösmanniella*, p. 166, No. 412, Fig. 581, which is, I believe, identical with our *Gelechia Hübneri*. Herr Krösmann's collection was not *particularly rich* in Micros; they were evidently not his *forte*, but I found there several species with which I was not previously acquainted, and picked up much valuable information. Herr Krösmann is very successful in breeding the rotten-wood and fungus feeders, and rears freely that lovely insect *Tinea nigralbella* from fungi on alder-trees, also *Tinea arcella* from rotten-wood; from the same pabulum he also rears, though not commonly, *Anchinia Balucella*, F. v. R. (H.-S. vol. v. p. 143, fig. 617); of this he gave me a specimen, which only differs in size from (that great rarity with us) *Aplota palpella*, and Herr Krösmann assured me that he had seen it more than once only half the size of the large specimen he gave me (see *ante*, p. 53). He also gave me bred specimens of *Incurvaria Körneriella*, and *Adela viridella*, with the cases from which the respective individuals had emerged; these cases had been found amongst fallen leaves in the spring. *Körneriella* will *certainly* be found in some of our beech-woods; he had also bred two or three of *Œcophora flavifrontella* from cases found on the ground.

He gave me specimens of *Laverna conturbatella* and *Butalis inspersella*, both bred from the shoots of *Epilobium angustifolium* (what a hint for those Entomologists who live where that plant grows freely!), and *Chauliodus Illigerellus*, bred from larvæ feeding, at the end of May and beginning of June, on *Ægopodium podagraria* (indeed that very evening Herr Krösmann went out and got some of these larvæ, and I found them waiting for me at the Hotel, on my return late at night from the Opera Guillaume Tell!) A singular circumstance was that Herr Krösmann showed

me in his breeding-cages the larvæ of *Lampronia prælatella, then feeding* by hundreds, whereas in England they have ceased feeding long before then. It would appear as if the greater cold of the Continental winters checked their jaw-work earlier in the autumn, and so left them more work to do in the spring. I obtained from Herr Krösmann two species I did not previously possess—*Ypsolophus Sabinellus*, and *Röslerstammia cariosella*—besides a new *Tinea, legitimella*, v. Heyden; I also borrowed for examination and eventual description a new *Tinea*, nearly allied to *fulvimitrella*, and which Herr Krösmann had placed in his cabinet as that species: this specimen I showed to the various Lepidopterists I subsequently visited, and having ascertained beyond a doubt that the species is new, I have much pleasure in naming it, after Herr Krösmann (in recollection of the very pleasant afternoon I spent with him), *Tinea Krösmannii*.*

The following day we proceeded to Berlin, arriving late at night at the Hôtel Brandenbourg, and the next day visited the Museum, saw Professor Klug, and made the acquaintance of Herr Hoppfer and Dr. Gerstäcker; the former gave me specimens of a very pretty new *Penthina roseomaculana*, Mann, and the following day when I visited his collection I obtained an indifferent specimen of Mr. Buxton's new *Chilo* (see *ante*, p. 33). After visiting Herr Hoppfer I proceeded to Alexander-Strasse to visit Herr Grabow, whom Professor Zeller had only discovered the previous autumn, and who had amassed an amount of valuable information during a series of years, all of which would pro-

* Tinea Krösmannii, n. sp. Alis anticis *brunneis*, maculis quatuor *flavidis*, *brunneo-reticulatis*, duabus dorsi, duabus alternantibus posterioribus costæ; capite ferrugineo. Exp. al. 9½ lin.

A larger and broader-winged insect than *Fulvimitrella*, the ground colour of the wings brown, not purplish-black; the spots *yellowish* and *reticulated with brown*; besides, the first costal spot is much larger than in *Fulvimitrella*.

bably have remained lost to science, but for the accidental discovery. So true it is that not merely the Micro-Lepidoptera, but also the Micro-Lepidopterists, *leben oft sehr verborgen!* (often live quite concealed).

Of Herr Grabow's observations the following were the most important. The larva of *Harpella bracteella* feeds in spring in decayed wood, it having been found under the bark of a branch of a mulberry tree, and also under the bark of dead branches of acacia: the larva of *Harpella proboscidella*, which has long been known as a wood-feeder, feeds in oak and willow, and spins its "frass" together very similarly to our *Dasycera sulphurella*, it bores through the wood in all directions; *Laverna atra* (the black variety) feeds in apple shoots as already mentioned (*ante*, p. 56); *Gelechia Populella*, the variety *Blattariella*, would appear to be a distinct species, it is found in early spring in the fallen birch leaves, in those which are rolled up; the head and second segment are pale brown, whereas in the ordinary larvæ of *Populella*, which feed on poplars in May and June, the head and second segment are black: the larva of *Gelechia pinguinella* feeds under the moss, on the trunks of poplar trees in May; the larva of *Gelechia alacella* feeds in June on the lichens on the trunks of orchard trees (see *ante*, p. 51); the larva of *Acrolepia assectella* feeds in the leaves or stems of the leek, in September; and the larva of *Asychna ceratella* (as already mentioned, see *ante*, p. 57) forms a gall on the flower-buds of *Polygonum aviculare*, which has the appearance of a small pod, and in it the larva feeds in the autumn, changing to pupa the following spring.

My visit to Herr Grabow was not of long duration, as I had an engagement that afternoon at Potsdam, but as my visit to General Direktor Lenné was not an Entomological one, I say nothing further of it here than that it was a very pleasant one, and I hope some day to repeat it and renew my acquaintance with the two amusing parrots.

In the evening Herr Dohrn took me to Dr. Staudinger's, and on pulling the bell at the Doctor's door the handle came off in my friend's hand, so that on Dr. Staudinger opening the door, the first proceeding was to present him with his own bell-handle. I am thus particular in mentioning this circumstance, for fear any incorrect version should get abroad which should represent the President of the Entomological Society of Stettin as a filcher of door-knockers. Dr. Staudinger is a young Lepidopterist of extraordinary energy, favourably known to the scientific world by his "Dissertatio Entomologica, de Sesiis agri Berolinensis"; the previous summer he had collected diligently in Corsica, where he obtained a great number of the larvæ of that rare butterfly *Papilio Hospiton* (these were emerging freely from the pupæ at the end of May when we called). Among the interesting *Micros* I obtained from Dr. Staudinger, I may mention *Euplocamus Morellus*, bred from decayed wood; *Gelechia plebejella* and *dryadella* from the Island of Corsica, the former especially interesting, it being a species nearly allied to *Terrella* (intermediate between it and *Senectella*), which Zeller established in the Isis, 1847, p. 850, from a single specimen; a new *Gelechia*, intermediate between *Populella* and *Scintillella*; and a new *Coleophora*. Dr. Staudinger is now engaged on a paper containing the results of his labours, on which account I omit a description here of these novelties. Dr. Staudinger has determined on an Entomological campaign in Iceland! a bold undertaking, but I fear not likely to be a profitable one; I trust next summer either as he goes there, or on his return, we shall see him in London.

This completed my visits to the Berlin Lepidopterists, and the following morning we departed for Glogau; the railway ran through a sandy district covered with pine-forests, and it was only in the immediate vicinity of the towns we passed that the land showed any signs of cultivation; at

Hansdorf, where the Glogau branch turns off, we had an hour to wait and dined there, not foreseeing the dinner that awaited us at Glogau; from Hansdorf to Glogau the country was generally far more extensively cultivated, and therefore less interesting to the eyes of an Entomologist.

In due time we arrived at Glogau, and found Professor Zeller and his daughter (who speaks English very fluently) waiting for us at the station. So we arrived at Glogau, and in due time were leaving the inn for the "Lares and Penates" of the great Micro-Lepidopterist; he called my attention to a red-brick building, a powder magazine, adding, "And in the neighbourhood of that I live!" My readers need not take this as a caution not to entrust their unique specimens to Professor Zeller for his determination, for since then my friend has changed his domicile. The conversation carried on between Mrs. Zeller and Mrs. Stainton was no doubt an extremely interesting one; for as neither could speak a word of the language of the other, it was necessarily carried on by the eyes. There was a very pretty look out from the Professor's upper-window, for being near the walls of the town we looked clean over them on to the plantations on the *glacis*, where nightingales were then singing a most hearty welcome to us; and in the distance we saw an extensive plain (for the country is all tolerably flat there), through which the sluggish Oder, then fast overflowing his banks, wended his way. Inside the room I must not forget to notice a little pet canary bird, so tame that it would perch on your finger, but which was rather shy of taking such liberties with strangers. This canary bird is since dead!

Of the Entomological wonders I saw at Glogau it is impossible here to enter into fully; very many species long known to me by name I then saw for the first time. I found many species that have never yet had the honour of

being published: to have gone minutely into all the points that interested me would have kept me fully employed for a week; but Herr Dohrn was inexorable, and we were only to stop at Glogau one clear day—but of all the things I met with at Professor Zeller's house, perhaps nothing made a greater impression upon me than the pudding (and I believe I returned it the complement); it was the first genuine first-rate German pudding we had met with, and a journal of our doings would be very incomplete unless this pudding received honourable mention.

The following morning I did not call on my friend till half-past six, thus allowing him a reasonable time to attend to his own Entomological concerns, for caterpillars will want food, and moths will come out in our cages and want setting, however busy we may be. Later in the day we were joined by a Coleopterist, Captain Quedenfeld, and Herr Milkner; and we went for an excursion to the Stadt-wald, an immense pine wood, where the imagination was impressed with a feeling of awe from the apparent infinity of the forest. On looking around the eye wandered through rows of trees, not resting upon any horizon caused by an inequality in the ground; nor by the density of the forest obstructing the view, but actually losing itself gradually in the distance. It was as when one sees the ocean for the first time! Of our doings in the Stadt-wald I have a *very pleasant* recollection; the cocoons and dead ichneumoned larvæ of *Eutricha Pini* had a charm for me they would never have possessed but for the species having been reputed British. Portions of the pupa skin of *Sphinx Pinastri* also appeared to me as holy relics; but presently friend Zeller shouts out *Dia!* and then I saw this *Melitæa* flitting about, and presently secured by Zeller's well-skilled forceps. Bye-and-bye, in a broad avenue in the wood, *Papilio Machaon* soared near the tops of the trees. Here I was

introduced to *Euchromia Arbutella*, of which larva, pupa and imago could all be simultaneously collected on the plants of *Arctostaphyllos Uva-ursi*. I also made the personal acquaintance of *Gnaphalium arenarium*, and two of the thereon feeding larvæ—*Coleophora Gnaphalii* and *Bucculatrix Gnaphaliella;* then as we sat under the small-leaved lime tree (*Tilia parvifolia*), the excitement of seeing strange birds, hearing the call of the *Oriolus Galbula*, whilst quietly sipping our punch, only disturbed by the gnats that *would* bite, and of which Mrs. Stainton retained the impressions for more than a week, formed a *tout ensemble* of pleasurable sensations not often experienced.

But to leave Glogau—for our stay there was but of short duration—we started at an early hour the following morning, reached Berlin in due course, could not find a droshki to take us to the Stettin-Eisenbahn till after we had walked or almost run a couple of miles, with half a dozen little urchins carrying our baggage; reached the station just in comfortable time, and in four hours we found ourselves tolerably tired and very hungry at Stettin.

At Stettin, or alternating between Stettin and Hökendorf, between the town and country residences of Herr Dohrn, we remained a week. A record of all that was seen and done there would take up too much space, neither would it be all Entomological; as, for instance, it would relate how in the great beech forest at Hökendorf, a steep sandy bank attracted the attention of Professor Zeller, and he made many and varied attempts to reach the summit—the loose slippery nature of the soil, and the angle of elevation, preventing the attainment of this object; it would tell how Herr Dohrn's three sons, and even the *sober* writer of these lines, joined in this boyish prank till we were all about as sandy as we well could be. At Stettin I made the acquaintance of Professor Hering, who has a fine collection of *Lepidoptera*,

and Herr Moewe, of Stockholm, who arrived by the steamer whilst we were there.

June the 5th we left Stettin, and arriving in Berlin the same evening, I had first an interview with Herr Grabow, who kindly lent me his beautiful drawings of the transformations of *Micro-Lepidoptera* (which I exhibited at the July meeting of the Entomological Society); and there I met for the first time Graf v. Nicelli: this, as many of my readers will know, was no ordinary meeting; we had both made the same subject our hobby for years, and I was well aware that latterly he had concentrated his attention on the subject (the genus LITHOCOLLETIS) much more than I had ever done (for few things *now* appear to me more rubbishy than the Monograph of British *Argyromiges*, which in 1848 I inflicted upon the readers of the Zoologist). Graf v. Nicelli showed me his manuscript, and his drawings of the wings of the insects: and I unhesitatingly declare, that if the publication of that elaborate Memoir takes place, as I hope and believe it will, it must inevitably take a high rank among the contributions to Entomological science.

The next morning we left Berlin and proceeded to Cassel. We had intended stopping at Eisenach, but an Evangelical Conference being on there at that time, we were afraid of having a difficulty in finding lodgings, and therefore proceeded to Cassel; we had some of the learned divines for fellow travellers in our railway carriage, and they told one another diverting stories the whole day, and kept us fully amused, though I don't profess to say I understood a tithe of what they said, yet with so much gesture and action it was a very different affair from three Englishmen talking quietly together, moving little but their lips.

From Cassel we proceeded, on the 7th of June, to Frankfort on the Maine. I had always had a great idea of going to Frankfort long before I conceived the grander idea of Glogau

and Stettin. My object in wanting to visit Frankfort was to see the Collection of Senator von Heyden; when at Glogau Professor Zeller had mentioned to me the name of a Herr Schmid, whom it would be desirable for me to see (future events have shown that he was indeed a *very desirable* person for me to see). But, as I was saying, we left Cassel at 8 A.M., and it *being an express train*, we accomplished the distance, 124 English miles, in six hours and a half! It was a *tremendously hot day*. We went to the Hôtel de l'Empéreur Romain, and after dining I sallied forth, and called on an old correspondent of mine, Herr Gabriel Koch (the author of the "Geographische Verbreitung, &c." see p. 153). Having looked over his Collection he took me to Herr Schmid, with whom I spent some hours; the information obtained from him is too numerous to be here detailed. I borrowed from him a manuscript of his "Observations on the Tineina," their transformations and habits, from which, the following day, I extracted nearly three pages of foolscap of valuable information.

But oh! that following day *what a hot* day it was! I never was so nearly melted in my life; but at the same time I was so very busy that I had not even time to melt. At an early hour I visited Senator von Heyden, whose Collection, as is well known, is arranged, not in a Cabinet, but in little boxes on the shelves of a book-case; here I had a rich treat, on every point my worthy host was well supplied with information; and among a few of the interesting novelties I saw *Argyresthia lævigatella* from *Pinus larix*, and *A. copiosella* from *P. cembra* in Switzerland, and a very pretty new *Gracilaria*-form insect, *frigidariella*, which Senator von Heyden had bred from cones on the Alpine willow in Switzerland; here also I became convinced of the existence of a distinct third species of *Nepticula* on the rose—*Nepticula centifoliella*. This differs

at a glance from *Anomalella* or *Angulifasciella*, by the straight, broad, pale golden fascia of the anterior wings (the larva was sent me this last autumn by Herr Mühlig, and though, like the larva of *Anomalella*, it forms a gallery, this is distinguished in the case of *Centifoliella* by not being *at its origin* entirely filled up with the black excrement, but *has a narrow empty border on each side;* the larva itself is pale amber, darker posteriorly, with the dorsal vessel dark *green*). On leaving Senator von Heyden in the morning I went to see the collection of Herr Mühlig, who is a most successful rearer of *Micro-Lepidoptera*, and has discovered several new species, especially in the genus *Coleophora*. The number of interesting things that I saw in his various cages will not allow of my specially mentioning them here. After leaving Herr Mühlig I hurried back to the hotel to continue my extracts from Herr Schmid's manuscript, and in the afternoon revisited Senator von Heyden, who apologized for his *negligé* dress, owing to the great heat. My reply was, that no apology was necessary, for it was a real treat to see any one looking cool; he then politely asked me if I would like to take off my coat, and I at once profited by the suggestion and taking off my coat and waistcoat worked away for two hours very diligently in *deshabille*. Here I met Herr Scheidel, a very enthusiastic Coleopterist, and made the acquaintance of a son of the worthy Senator, who is also an ardent Entomologist. In the evening it was fortunately much cooler, and Senator von Heyden invited us all to the Main Lust, where we vastly enjoyed the fresh breezes from the river whilst we sat at our supper, our ears being regaled with the music of a very respectable band.

The following day we quitted Frankfort, going south by the Badische Eisenbahn, and arrived in the evening at Freiburg; here we met Dr. Fischer, the Orthopterist. The next morning, leaving railways and their conveniences behind us, we

travelled extra post through the Höllenthal, walking up the hill at Steig amongst no end of strange flowers; on our right was the huge Feldberg, still with much unmelted snow on its rugged top; then we descended to the shores of the Titisee, and soon afterwards arrived at Lenzkirch, where we stopped to dine. This was our first incursion into scenery of a really grand nature. Thuringia we had thought pretty, but here we saw something far more than pretty, and as, after leaving Lenzkirch, we found the meadows assuming a more subalpine flora, and beautiful, and, to us, strange insects flitted on all sides, the idea struck me HOW MANY, HOW VERY MANY WOULD THAT SUMMER TRAVEL OVER THAT VERY GROUND WE WERE THEN TRAVELLING OVER WITHOUT REAPING ANY OF THAT INTENSE DELIGHT WHICH SOME ACQUAINTANCE WITH THE PRODUCTIONS OF NATURE WOULD AFFORD THEM. Here in the meadows were growing *Trollius Europæus* and *Geranium pratense*, neither of which had I seen wild since I visited the lake district of Cumberland in 1846; and what botanist has not felt the pleasure (akin to that of meeting with an old friend after years of absence) of finding after a lapse of time some plant not seen for many years? and who that is not a naturalist can know that feeling?

I have often thought that if Mr. Albert Smith in his "Ascent of Mont Blanc" would give some details of the successive changes of vegetation, and the different forms of insect life, by which as he ascended from the verdant valley to the snow-clad summit he found himself surrounded, he would add much to the interest of his story with many of his younger hearers. His capability of improving his tale year by year, so as to make it ever interesting and ever instructive, induces me to throw out this suggestion; and if during next August's recess he visits the land of mountains and lakes, with the view of practically observing some

of the Botanical and Entomological features of the ascent to the snow-line, his hearers in 1857 will no doubt be benefited by the results of his observations.

It was after we had left Lenzkirch that we saw the first *Podalirius;* it was sitting on a leaf of a cherry tree.

In due time we reached Stühlingen and entered Switzerland, and before the sun had sunk behind the bank of clouds in the west, we were gazing at the Rheinfall from the gardens of the Hotel Weber.

Here, however, we found no Entomologists, and though but six hours removed from Zurich, the residence of Professor Frey, we were unable to proceed further; and the next day, turning our backs on Schaffhausen and the Rheinfall, we hurried home as fast as it was possible to travel, and so ended our travels from "GHENT TO GLOGAU, AND STETTIN TO SCHAFFHAUSEN, IN SEARCH OF ENTOMOLOGISTS."

NEW WORKS ON ENTOMOLOGY.

(By the Editor.)

The present year has produced in England three Entomological works of unusual importance (the entire cost of all three is exactly 21*s.*); these we enumerate in the order of publication.

THE ENTOMOLOGIST'S ANNUAL FOR 1855.

Second Edition, pp. 153. London: John Van Voorst, Price 2*s.* 6*d.*

The rapidity with which the First Edition was *taken up* not only rendered a Second Edition of the Annual necessary, but by revealing a much larger demand than the most sanguine had anticipated, enabled the bulk of the work to be considerably increased without any addition to the cost.

The Contents of the Second Edition were as follows:—

Those Articles to which an * is here prefixed were added to the Second Edition, not having appeared in the original edition. On this subject the following passage appeared in the Preface to the Second Edition.

"In preparing the Second Edition I found myself able to expand the volume a little, and have therefore introduced 'An Address to Young Entomologists at Eton, Harrow, Winchester, Rugby and at all other Schools,' and 'Instructions in Collecting and Preserving *Lepidoptera* and *Coleoptera*,' which will I hope be found useful to those for whose benefit they are intended. I hope that this increase in the size of this edition will not render the purchasers of the first edition dissatisfied with their bargain; as these chapters are quite elementary they are comparatively useless to the 'old hands,' yet, if anyone feels himself aggrieved in this matter, if he wishes it, I shall be happy to give him a copy of the Second Edition in exchange for his copy of the first.*"

The following extracts from the additional matter are given as samples.

"An Entomologist soon finds that the field before him is *so vast*, that even if, as is now generally the case, he confine himself to one order of insects, for him to catch a sufficient quantity of each species to supply even his limited circle of young Entomological acquaintance

* I may here mention, that I have by me a *few* copies of the Second Edition, of which *the covers are soiled*, and which I shall be happy to dispose of to any Entomologist for 1*s.* 3*d.* each. Entomologists in the Country can forward postage stamps for that amount.

is no pursuit for an idler; indeed he cannot long have pursued this branch of Natural History without noticing that if, as the late Dr. Arnold remarked, an early separation is observed at school between the idlers and the workers of the community, that he has already taken his election among the latter class.

"Want of useful employment for their time is the great bane of the mass of mankind—for Satan finds some mischief still for idle hands to do—any one who can early initiate the young to some attractive amusement, which shall at the same time afford them useful employment, becomes a benefactor to his race. Now, of all branches of study, Entomology is perhaps the most attractive to the young."

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"But even the fortunate possessor of several works on Entomology will still find himself at a loss to name many of his specimens; yet there are several Entomologists, who, like myself, would gladly afford any beginner such information as he might feel disposed to seek—but how is the tyro to get acquainted with any of these useful members of the community? Of course I cannot answer so clearly for others as I can for myself, but I know this, that if any young collector (not under fourteen years of age) were to write to me for information, I should be more pleased at receiving his inquiry than he would be at obtaining my answer; and let him not imagine that I am a sedate elderly person, with no fellow feeling for a mischievous school boy. I have no sedateness about me, and am as full of fun as any one; and as the late Dr. Arnold used, when at Laleham, to 'romp and play in the garden, or plunge with a boy's delight into the Thames, entering into his pupils' amusements with scarcely less glee than themselves,' so I am quite ready to participate in the delight of the youngest Entomologist, on adding some species to his collection, or some new fact to his knowledge—but further to facilitate the first step, and we all know that 'ce n'est que le premier pas qui coute,' I here give samples of letters such as may be useful as models by those seeking for information:—

"Dear Sir,

"Encouraged by your invitation in the Entomologist's Annual, I write to ask if you can tell me at what time of the year I should seek for the larvæ of the Emperor moth (*Saturnia Carpini*), and which would be the most likely localities in which to find them.

"Believe me, dear Sir,

"Yours very truly."

"Dear Sir,

"I lately found a hairy caterpillar of a bright yellow, with long red tufts of hair, and a black chain-like mark down the back. I have tried it with various kinds of food, and it will not eat. Can you tell me what it is? and on what plant I should feed it? Your invitation to those in search of information encourages me to trouble you with this inquiry.

"Believe me, dear Sir,

"Yours very truly."

From Mr. Wollaston's "Notes on the Collecting and Preserving of Coleoptera," the following extract furnishes a good specimen of the pleasant genial style of that writer.

"It is a mistake to suppose that the progress of agriculture needs to lay waste our Entomological preserves and to exterminate insect life. In some few instances (as in the destruction of forests), this may be and probably is the case, but I am convinced that, in a general way, the very reverse is nearer the truth. The vast superiority of the London district (highly cultivated as it is) over almost every other in England, may be quoted in support of this; and I may add, from personal observation, that I have never met with such marked success as along railway embankments, and on other grounds recently turned up by the edges of gardens and fields where the vegetation is rank and redundant. Let not the collector assume, therefore, that he must needs sally to a distance for his game, since he will often reap a richer harvest a hundred yards from his own door than by taking a 'return ticket' (which involves moreover the loss of time) for a hundred miles into the country, perchance into some cold clayey region where his exertions will prove comparatively fruitless.

"Let the moss be carefully examined (for the minuter tribes) wherever it can be procured, though more especially from off the trunks of trees. The best plan in the winter months is to shake it over a large bag, the contents of which may be gradually turned out on a sheet of white paper at home; and if overhauled in front of a window nothing will be lost, as those species which escape will almost invariably fly or run to the light, and may be immediately secured from off the glass."

CATALOGUE OF BRITISH HYMENOPTERA in the Collection of the British Museum. By FREDERICK SMITH, M.E.S.

PART I. Apidæ—Bees. 1855. Price 6*s.**

John Bull is a singular individual; he never can do anything in a straightforward way, but is always making tremendous circles in order to reach a spot immediately in front of him. If he wishes to retire from parliament it cannot be done, unless he can obtain some situation under the crown, when at once his seat is vacant. If he wishes to retire from the East India Direction, why he has to sell his stock and then he is no longer qualified. The volume before us has induced these remarks, because it is not a Catalogue but a Monograph, and as such probably the most useful work which has yet been "printed by order of the Trustees" of the British Museum: but then it could not be called a Monograph; that would be too straightforward for John, and so it is misnamed a Catalogue, and everybody is requested to observe whenever the work is noticed, that it is—

> "No Catalogue, no Catalogue, no Catalogue at all,
> But a truly magnificent Monograph."

This volume extends to 248 pages, 12mo., with 10 Plain Plates; it contains full descriptions of all the known species of British Bees, with notices of their habits and economy. As samples of the pleasant style and truth-seeking earnestness of the author, we quote the following passages, and the work abounds with many others of equal interest.

"The bees included in the genus *Andrena* may be truly said to be the harbingers of spring, for on the first fine days of April males will be found frequenting the catkins and the early flowers of spring. My earliest date of their capture is March 4th, 1849, when I met with *Andrena bicolor* and *Gwynana*, both sexes of each.

"This genus is by far the most numerous in species of all the genera of bees found in this country. We have about seventy known species, and when the northern parts of the country are assiduously searched, no doubt many more will be added. These bees are all burrowers in the ground, some species preferring banks

* Some difficulty is frequently experienced by country Entomologists in obtaining the Museum Catalogues through a bookseller. E. Newman, of 9, Devonshire Street, Bishopsgate, will be happy to execute orders for any; see classified list on Wrapper of Zoologist for January, 1856.

I shall be happy to supply any Entomologist with this Catalogue of Mr. Smith's on the receipt of 6*s.* in postage stamps.

of light earth, others hard trodden pathways, &c.; their burrows differ in depth, but are seldom less than about six, whilst others excavate to nine or ten inches. At the bottom of each burrow is formed a small oval cell, or chamber, in which the industrious female lays up a small pellet of pollen mixed with honey; these little balls are usually about the size of a garden pea, varying somewhat in size in different species. Sometimes, apparently to economise time, the bee constructs branch tunnels, each having a similar chamber at its extremity; this peculiarity I have observed in *A. rubricata* and *A. fulvescens;* it is also probably not unusual with many other species. When she has completed her task, she closes the mouth of the tunnel.

"These bees are subject to the attacks of parasites; the first to be remarked upon are those bees which compose the genus *Nomada;* they are more popularly known as wasp-bees, since they bear a considerable resemblance to some of the small solitary species of that family. These parasites appear to be upon a perfectly friendly footing with the industrious bees, and are permitted without let or hindrance to enter their burrows. It has been advanced as a proof of the ingenuity and artifice necessary to be employed in effecting the deposit of their eggs in the working bees' nests, that the parasites should bear a close resemblance to the bees upon which they are parasitic. Some instances may undoubtedly be advanced, as *Apathus* and *Bombus*, and also in the different species of *Volucella* which infest the nests of humble bees, but amongst the solitary bees no such resemblance is required to aid in any necessary deception. It may be remarked that the two cases are not analogous; this is true, and I am not prepared to say that in the case of the *Bombi* and their enemies, it may not be necessary, but as regards solitary bees it certainly is not; colonies of *Andrenidæ* and their parasites mingle together in perfect harmony, issuing from and entering into the burrows indiscriminately. I have on several occasions watched with much enjoyment a large colony of *Eucera longicornis*, the males occasionally darting forward with great velocity, then turning sharply round, and as it were swimming in circles close to the ground, then darting off again and again in an unceasing round of sportive enjoyment; their industrious partners, whose whole existence appears to be bound up in one unceasing round of labour, would occasionally return home laden with food for their young progeny. Sometimes it would happen that a *Nomada* had previously entered her nest; when such proved to be the case she would issue from it, and flying off to a short distance wait patiently until the parasite came forth, when she would re-enter and deposit her burden. It will be observed in this instance that between *Eucera* and *Nomada* no resemblance exists in general appearance, one being several times larger than the other, and covered with pu-

bescence of a sombre colour, whereas the parasite is a gaily coloured insect, destitute of pubescence, and readily observed from the brightness of its colouring. . . . . Much further investigation is still necessary before we can arrive at a knowledge of the real nature of the connexion which exists between the bees and their parasites. It has been supposed that the parasitic larva is hatched sooner than that of the rightful owner of the nest, and that it consequently consumes the food and leaves the larva of the bee to perish. But to this I do not assent; it appears so contrary to all natural laws that I cannot think it even probable; nature I have never observed to be thus wasteful of animal life—such a proceeding is unnecessary and therefore unlikely. Where a destruction of animal life is observed, it can usually be traced to some reasonable cause, as the destruction of the larvæ of certain *Lepidoptera*, being a check upon their superabundance; a parallel to this does not appear to me to exist in the case of the bees. I am more inclined to believe, that when the parasite has deposited her egg upon the store of pollen, the industrious bee at once deserts it and proceeds to construct a fresh burrow; and that the parasites which may be observed constantly entering different burrows, do so in order that they may find the requisite quantity of food, which will usually be much less than that required for the industrious bee; having found which, they deposit their egg, and the nest is then possibly deserted by its legitimate owner." . . . . . .

"If I were asked which genus of bees would afford the most abundant materials for an essay on the diversity of instinct, I should without hesitation point out the genus *Osmia*." . . . "*O. aurulenta* and *O. bicolor* are bees which commonly burrow in banks; the latter being very abundant in some situations, forming colonies, but although it appears to be the natural habit of these species to construct tunnels in hard banks, with great labour and untiring perseverance, still we find them at times exhibiting an amount of sagacity and a degree of knowledge that at once dispels the idea of their actions being the result of a mere blind instinct, impelling them in one undeviating course. A moment's consideration will suffice to call to mind many tunnels and tubes ready-formed, which would appear to be admirably adapted for the purposes of the bees; for instance, the straws of a thatch and many reeds; and what could be more admirably adapted to their requirements than the tubes of many shells? So thinks the bee! *O. aurulenta* and *O. bicolor* both select the shells of *Helix hortensis* and *H. nemoralis*; the shells of these snails are of course very abundant, and lie half hidden beneath grass, mosses and plants; the bees finding them in such situations dispense with their accustomed labour and take possession of the deserted shells. The number of cells varies according to the length of the whorl of the shell selected, the usual number

being four, but in some instances they construct five or six, commencing at the end of the whorl; a suitable supply of pollen and honey is collected, an egg deposited, and a partition formed of abraded vegetable matter; the process is repeated until the requisite number is formed, when the whole is most carefully protected by closing up the entrance with small pellets of clay, sticks and pebbles; these are firmly cemented together with some glutinous matter, and the bee has finished her task.

"We will now observe the intelligence of the bee under different circumstances; she has selected the adult shell of *Helix aspersa;* the whorl of this species is much larger in diameter than that of *H. nemoralis* or *H. hortensis*—too wide, in fact, for a single cell. Our little architect, never at a loss, readily adapts it to her purpose by forming two cells side by side, and as she advances towards the entrance of the whorl, it becomes too wide even for this contrivance. Here let us admire the ingenuity of the little creature; she constructs a couple of cells transversely! And this is the little animal which has been so blindly slandered as being a mere machine!"

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"The *Bombi* are the most generally known of all the genera of wild bees; hence they have received a variety of popular names. In Hampshire they are called Dumbledors, in other districts Bumble-bees and Hummel-bees; the brown species are known in Scotland as the Foggie-bee, no idea existing of there being more than one species of that colour. It is very probable that Humble may be a corruption of humming, for we constantly find, in natural history, popular names given to animals and plants extremely characteristic. No one, who loves to watch nature in all her varied guise, can have failed in early spring, when the catkins are first found on the willow, to notice the loud hum of the females of different species of *Bombi;* and in May, when the horse-chestnut blooms, from the break to the close of day the hum of these industrious bees is unceasing."

We annex a list of the British Bees which will be found described in the work before us, feeling confident that this volume will give a vast stimulus to the study of this group of insects, and that a bird's-eye view of the whole will be found of considerable assistance.

Catalogue of British Andrenidæ and Apidæ.

Fam. 1. ANDRENIDÆ.

Subfam. 1. OBTUSILINGUES.

Genus 1. Colletes.
1. succincta.
2. fodiens.
3. marginata.
4. Daviesana.

2. Prosopis.
1. communis.
2. annularis.
3. dilatata.
4. cornuta.

5. punctulatissima.
6. signata.
7. hyalinata.
8. varipes.
9. variegata.

Subfam. 2. ACUTILINGUES.

3. SPHECODES.
1. gibbus.
2. rufescens.
3. subquadratus.
4. ephippia.
5. fuscipennis.

4. HALICTUS.
1. rubicundus.
2. xanthopus.
3. leucozonius.
4. zonulus.
5. quadricinctus.
6. sexnotatus.
7. 4-notatus.
8. maculatus.
9. cylindricus.
10. albipes.
11. prasinus.
12. lugubris.
13. flavipes.
14. gramineus.
15. Smeathmanellus.
16. æratus.
17. morio.
18. leucopus.
19. longulus.
20. lævis.
21. subfasciatus.
22. fulvicornis.
23. minutus.
24. nitidiusculus.
25. interruptus.
26. minutissimus.

5. ANDRENA.
1. Hattorfiana.
2. Rosæ.
3. eximia.
4. florea.
5. decorata.
6. Cetii.
7. cingulata.
8. ferox.
9. cineraria.
10. pilipes.
11. thoracica.
12. nitida.
13. vitrea.
14. albicans.
15. similis.
16. fulva.
17. Clarkella.
18. Gwynana.
19. bicolor.
20. helvola.
21. varians.
22. atriceps.
23. Mouffetella.
24. nigro-ænea.
25. Trimmerana.
26. conjuncta.
27. spinigera.
28. picicornis.
29. bimaculata.
30. Smithella.
31. Lapponica.
32. nigriceps.
33. simillima.
34. pubescens.
35. angustior.
36. denticulata.
37. tridentata.
38. fucata.
39. picipes.
40. clypeata.
41. constricta.
42. frontalis.
43. Aprilina.
44. fulvicrus.
45. extricata.
46. polita.
47. fulvago.
48. fulvescens.
49. longipes.
50. albicrus.

51. labialis.
52. chrysosceles.
53. Coitana.
54. analis.
55. minutula.
56. nana.
57. nigrifrons.
58. argentata.
59. dorsata.
60. connectens.
61. fuscata.
62. Afzeliella.
63. convexiuscula.
64. Kirbyi.
65. Collinsonana.
66. Lewinella.
67. Wilkella.
68. xanthura.

6. MACROPIS.
1. labiata.

7. CILISSA.
1. hæmorrhoidalis.
2. leporina.

8. DASYPODA.
1. hirtipes.

Fam. II. APIDÆ.

Subfam. 1. ANDRENOIDES.

1. PANURGUS.
1. calcaratus.
2. Banksianus.

Subfam. 2. CUCULINÆ.

2. NOMADA.
1. ruficornis.
2. lateralis.
3. baccata.
4. ochrostoma.
5. borealis.
6. signata.
7. Lathburiana.
8. varia.
9. xanthosticta.
10. flavoguttata.
11. Roberjeotiana.
12. armata.
13. rubra.
14. furva.
15. mistura.
16. Fabriciana.
17. Germanica.
18. atrata.
19. Solidaginis.
20. Jacobææ.
21. lineola.
22. alternata.
23. sexfasciata.
24. succincta.

3. EPEOLUS.
1. variegatus.

4. CŒLIOXYS.
1. quadridentata.
2. simplex.
3. sponsa.
4. umbrina.
5. rufescens.
6. Vectis.

5. STELIS.
1. aterrima.
2. phæoptera.
3. octomaculata.

6. MELECTA.
1. luctuosa.
2. armata.

Subfam. 3. DASYGASTRÆ.

7. OSMIA.
1. rufa.
2. aurulenta.
3. bicolor.
4. xanthomelana.
5. parietina.
6. pilicornis.
7. fulviventris.
8. spinulosa.
9. ænea.
10. leucomelana.

8. MEGACHILE.
1. centuncularis.
2. ligniseca.

3. versicolor.
4. pyrina.
5. odontura.
6. argentata.
7. circumcincta.
8. Willughbiella.
9. maritima.

9. ANTHIDIUM.
1. manicatum.

10. CHELOSTOMA.
1. florisomne.
2. Campanularum.

11. HERIADES.
1. truncorum.

12. CERATINA.
1. cærulea.
2. albilabris.

Subfam. 4. SCOPULIPEDES.

13. EUCERA.
1. longicornis.

14. SAROPODA.
1. bimaculata.

15. ANTHOPHORA.
1. retusa.
2. acervorum.
3. quadrimaculata.
4. furcata.

Subfam. 5. SOCIALES.

16. BOMBUS.
1. muscorum.
2. senilis.
3. Smithianus.
4. fragrans.
5. sylvarum.
6. lapponicus.
7. Derhamellus.
8. pratorum.
9. nivalis.
10. Scrimshiranus.
11. collinus.
12. terrestris.
13. lucorum.
14. soroensis.
15. lapidarius.
16. hortorum.
17. Latreillellus.
18. subterraneus.

17. APATHUS.
1. rupestris.
2. campestris.
3. Barbutellus.
4. vestalis.

18. APIS.
1. mellifica.

THE NATURAL HISTORY OF THE TINEINA. Vol. I., containing NEPTICULA, Part 1; CEMIOSTOMA, Part 1. By H. T. STAINTON, assisted by Professor ZELLER and J. W. DOUGLAS. Eight coloured Plates. 8vo. Pp. 338. London: JOHN VAN VOORST, Paternoster Row; Paris: DEYROLLE, Rue de la Monnaie 19; Berlin: E. S. MITTLER and SOHN, Zimmerstrasse 84, 85. Price 12*s.* 6*d.*; 15 francs; 4 thlr. 6 sgr.

The following is extracted from the Preface,—

"The letter-press appears in four languages, viz., English, French, German and Latin; so that it is hoped no Entomologist in Europe will find it a sealed book to him.

"The present volume contains twenty-one species of NEPTICULA (a genus interesting from the brilliancy of the perfect insects, among which are the smallest known *Lepidoptera*), and three species of CEMIOSTOMA (a genus of small species, remarkable from the neatness of the design on the anterior wings of the perfect insects); and it is intended that each of the subsequent volumes should contain twenty-four species, either all of one genus, or, at least, in allied genera.

"I must again beg, that each Entomologist who *discovers* the transformations of any species of *Tineina* will at once communicate with me; and when possible that he will also forward me the living larvæ, for the purpose of being figured and described. It is to encourage such communications that I offer to present to every one who shall first discover and communicate to me the transformations of twenty species, with which I was previously unacquainted, a copy of the entire series of this Work.* If each Entomologist would send me a list of the species of which he knows the transformations, I would at once point out to him which are new to me, and in reference to the British species I have already indicated in the Second Edition of 'The Entomologist's Companion' all those whose transformations were unknown to me."

* When this proposal was first made, I received the following letter from one of my most useful correspondents:—

"I received your letter and the annexed Prospectus, and am very much pleased with the idea of the Publication of the transformations of the *Tineina*, in the manner proposed, and shall be most happy to become a Subscriber for one copy of the proposed work.

"With respect to your proposal 'to present a Copy of the entire Series to every one who shall first discover and communicate to you the transformations of twenty species of *Tineina* with which you were previously unacquainted,' I hardly know, as far as I am concerned, what to say, for if you had never commenced or proposed this work, whatever discoveries I might have made would have been freely communicated to you; but, however, I will enter the lists, and if I come off a successful competitor, I shall prize the volumes thus obtained far more than if they had cost me in cash ten times their value, and if I fail (of which at present I have no idea) it shall not be from any fault of mine; and if a winner, I will make a present of the Subscription Copy to some less fortunate 'Brother of the net and pin.'

"Yours very truly,

"RICHARD SHIELD.

"6, *Fleet Street, Dublin, January 30th*, 1854."

The following extracts from the body of the work will show the mode in which the subject is treated.

"No. I.—NEPTICULA AURELLA.

"Plate I. Fig. 1.

"How noticeable.—Larva.

"Few persons can have failed to observe, especially at the commencement of spring, that the leaves of the common bramble are frequently marked with small serpentine whitish blotches—sometimes several in one leaf. These blotches are the mines of the larvæ of *N. aurella*. When they are very conspicuous, that is of itself an indication that their tenants have deserted them; but, if we search more closely, we shall probably find among many mines some which are only slightly discoloured, and in these the larvæ still feeding.

"How noticeable.—Imago.

"In windy yet sunny weather, in the months of May and August, this little moth may sometimes be observed on palings and trunks of trees.

"Mode of Life.

"*The egg* is deposited on the under surface (rarely on the upper surface) of the bramble leaf; immediately it is hatched, the *larva* bores into the leaf and commences feeding between the skins on the upper layer of parenchyma, and proceeds in an irregular, not contorted, wavy path of moderate width. The mined place, which is only visible on the upper surface of the leaf, is at first greenish grey, gradually changing to greenish white, and along the centre of it is a string of blackish excrement. When the larva is full fed, it makes a fissure in the upper side of the leaf and creeps out, the place it had just occupied being distinguished by the absence of any grains of excrement. Arrived at the outside of the leaf, the larva hastens to seek a secure place (probably on the ground amongst leaves), and there spins a rather flat *cocoon*, of an irregular shape with scalloped edges, and of a colour varying from pale dirty-green to pale brown; in this it changes to a *pupa*, and at the expiration of three weeks, or longer if the weather be cold, the pupa protrudes its head through one end of the cocoon, and its skin cracking, the *imago* is liberated. There are several broods in the year, and the brambles being evergreen, the larva may be found in mild seasons throughout the winter. April, July and October may be considered as the principal months in which the larva feeds, and its *imago* is plentiful in May and June, and not uncommon in August."

Then follow—

"Description of the Imago;
"Description of the Larva;
"Geographical Distribution;
"Synonymy;
"Remarks on the Synonymy;

And

"Observations of Authors;"

and the same detailed account is given for each species; those of recent discovery being fortunately blest with the very briefest synonymy, and thus not requiring so lengthened a notice as species of the antiquity of *Aurella* and *Anomalella*.

The first idea (afterwards developed into this work) originated with Mr. Douglas on the 9th of April (Professor Zeller's birthday), 1852, as recorded in the Entomologist's Companion, 2nd Edition, p. 101. The actual idea was put into writing in the spring of 1853, and made generally known in January, 1854. In October. 1855, Vol. I. was published.

The following Entomological Works of considerable importance have lately been published on the Continent.

GUIDE DU JEUNE AMATEUR DE COLEOPTERES ET DE LEPIDOPTERES, indiquant les ustensiles nécessaires à la chasse de ces Insectes, les lieux et époques les plus favorables à cette chasse, suivi de la manière de les preparer, et de les conserver. 12mo. Pp. 122. Paris: DEYROLLE, Rue de la Monnaie 19. 1847. Prix 2 fr. 50 c.

This is a *very useful* work, the Coleopterous portion is written by M. Léon Fairmaire, the Lepidopterous portion by the late M. A. Pierret; thirty-four pages are devoted to the Coleoptera, eighty-eight to the Lepidoptera—the modes of catching, and localities frequented by the various species are very instructive to the English Entomologist. as many insects which, guided by this work, he might probably find with ease, are reckoned amongst our greatest rarities.*

* I have imported several copies of this work, with which I shall be happy to supply any Entomologist at the price of 2*s*. 3*d*. each.

SYNOPSIS DES CALOPTERYGINES. Par M. E. DE SELYS-LONGCHAMPS. 8vo. Pp. 73. Bruxelles: M. HAYEZ, Imprimeur de l'Académie Royale. 1853.

This is a synoptical table of the species which will be described in the *Histoire des Insectes Odonates*, undertaken by M. de Selys Longchamps, in conjunction with that great Neuropterist Dr. Hagen. In the Sub-family Caloptérygines, one hundred species are here enumerated, whereas only two were known to Linnæus, and only twenty-seven to Rambur in 1841.

HISTOIRE NATURELLE DES INSECTES—SPECIES GENERAL DES LEPIDOPTERES. Noctuélites par M. A. GUENEE. 3 vols. 8vo., with Plates. Paris: LIBRAIRIE ENCYCLOPEDIQUE DE RORET, Rue Hautefeuille 12. 1852. Price (with plain Plates) 23s. 6d. (Messrs. WILLIAMS and NORGATE, of 14, Henrietta Street, Covent Garden, London, will be happy to execute orders at that price.)

An elaborate work, and one which every French scholar, who takes an interest in the Noctuæ, should possess. It embraces the Noctuæ not only of Europe, but of the whole world, and will thus be very useful to those exploring foreign countries. The habits of the larvæ of the different genera and families, as detailed in the "généralités" at the commencement of each group, render it extremely interesting to the scientific Entomologist, and very useful to the energetic collector. Many of our rarities will be rendered common when this work becomes more generally read; it speaks very little for the energy of Entomological book-makers in England, that an abstract of this work has not already been published here. Let no one mistake us: it is not a Monograph; descriptions are only given of those species which had not been previously described, or which had been ill-described—consequently reference must be continually made to the works of Ochsenheimer, Treitschke, Hübner, Duponchel, Herrich-Schäffer and Freyer; and the work only attains its maximum of utility in the hands of those who possess the works of the above authors.

On two points the author has developed new crotchets; both highly absurd—in the first place, he puts after the specific name of the species, not that of the writer who gave it *that name*, but that of the author who first described and figured the insect at all, whether he gave it any name or not: thus *Tryphœna pronuba*,

Linnæus, becomes TRYPHÆNA PRONUBA, Albin. Now Albin never called the insect *pronuba* at all: why then should it be called *pronuba*, Albin? Linnæus was the first who named it *pronuba*, and, therefore, according to the rule universal in zoology, except among certain demented Lepidopterists, we say *pronuba*, Linnæus. A more amusingly absurd instance of the same nonsense is the *Anophia Ramburii*, Clerck: Clerck *never* called it *Ramburii*—how forsooth could he, as Dr. Rambur was not born till long after Clerck was dead? Clerck figured this insect as *Leucomelas*, but Linnæus described another species under that name, and so the *Leucomelas*, Clerck, must necessarily take the next oldest name, *Ramburii*, Boisduval: but, according to the new crotchet, appended to the name *Ramburii* must come Clerck, because he first figured the insect! *Hos* absurdity its limits?

In the second place Guenée has undertaken to set Englishmen right in their use of the English language: this is very kind of him, but we fear we are so modest that no Englishman will be found bold enough to undertake to teach him how to use the French language. Thus at page xxv, we are told that the English translate the word Noctua, by Moth, and that this latter expression is also used to designate the bird of night (*the owl*): at page lxvii, we are informed that Barbut published, in 1791, a work on English insects, in which the Noctuæ are confounded with all the Nocturnal Lepidoptera, under the generic name of *Moths, which according to that author is equivalent to the Linnæan Phalænæ!*

We beg to assure M. Guenée that Barbut is quite right: the Bombyces, Geometræ, Pyrales, Tortrices, Tineæ and Pterophori are all called *moths* in England, *by the English*.

These crotchets are but spots in the sun: the work is one of extreme value and cannot be too extensively read, but knowing that the sun has worshippers in this country, who for ought we know worship also his spots, we have felt it our duty to call attention to them.

To English book-buyers, the price of foreign works is something perfectly unintelligible: here is a work containing nearly 1300 closely printed pages, with 24 plates: thus containing about as much matter as five volumes of the Insecta Britannica, and to be had for less than the price of one volume of that series!

HISTOIRE NATURELLE DES INSECTES—SPECIES GENERAL DES LEPIDOPTERES, DELTOIDES ET PYRALITES. Par M. A. Guenee. 1 vol. 8vo., with Plates. Paris: Librairie Encyclopedique de Roret, Rue Hautefeuille 12. 1854. Price (with plain Plate) 7s. 6d.

We have not had time to give sufficient attention to this work to give our readers any notice of it.

BERAETTELSE OM FRAMSTEGEN I INSEKTERNAS, MYRIAPODERNAS OCH ARACHNIDERNAS NATURAL HISTORIA FOR 1851 OCH 1852. Till Kongl. Vetenskaps-Akademien af given af C. H. Boheman. 1 vol. 8vo. Pp. 342. Stockholm: P. A. Norstedt och Soner. 1854.

A very elaborate and systematic report on the Entomological publications of the years 1851 and 1852; written in the Swedish language. As a means of informing Swedes of what is doing *out of* Sweden this work is of great service, and to us it is extremely useful for the detailed notices it contains of what is being done *in* Sweden.

HISTOIRE NATURELLE DES INSECTES—GENERA DES COLEOPTERES. Par M. Th. Lacordaire. 8vo. Vols. I. and II., 1854; Vol. III., 1855. Paris: Librairie Encyclopedique de Roret, Rue Hautefeuille 12. Price, to Subscribers, 5s. 6d. per Volume: to Non-Subscribers, 6s.

I am indebted to the courtesy of Mr. Westwood* for the following notice of this publication.

"This work contains the characters of the families and genera of Coleoptera, and indications of the species. The first volume, containing 506 pages, comprises the families Cicindélites, Carabiques, Dytiscides, Gyrinides and Palpicornes. The second volume,

* The Council of the Royal Society has awarded one of the two Royal medals this year to J. O. Westwood, Esq., for his various Monographs and Papers on Entomology.—*Athenæum*, November 17th, 1855.

containing 548 pages, comprises the families Paussides, Staphylinieus, Pselaphiens, Scydmenides, Silphales, Spheriens, Trychopterygiens, Scaphidides, Histeriens, Phalacrides, Nitidulaires, Trogositaires, Colydiens, Rhysodides, Cucujites, Cryptophagides, Latridiens, Mycetophagides, Thorictides, Dermestins, Byrrhiens, Georyssiens, Parnides and Heterocerides. The third volume comprises only the two great groups Lucanides and Lamellicornes. And the fourth volume, which is considerably advanced, will contain the Serricornes, Malacodermes, Lymexylonides, Ptiniores, and probably the Melasomes.

"Those who are at all acquainted with the advance of Entomological literature during the last thirty or forty years must be well aware to what a vast extent the study of the COLEOPTERA has been carried in comparison with that of any other order of insect; and at the same time how great an amount of labour must be required in order to bring into one focus the numbers of Genera which have been described during the period by authors who have profited by the Transactions of Societies and the various periodical publications devoted not only to Natural History but to Science in general, in order to give to the world from time to time descriptions of a few species or genera, instead of following the plan of the old authors, and waiting until they had severally amassed materials for a weighty folio or quarto. Ten years ago Erichson enumerated 5,180 genera of COLEOPTERA; to these we may add at least 820 others as omissions or subsequent creations, giving not fewer than 6,000 genera of beetles!

"With such a mass of materials before him, the plan which M. Lacordaire has adopted appears to be the most satisfactory which could have been chosen. Instead of following in the steps of his predecessors in the volumes of the 'Suites à Buffon,' who have not only re-described the previously characterized genera, but have also established numerous new ones, as well as numbers of new species, our author has considered that the science rather needed a strict revision of the already existing materials scattered in so many quarters, in order, as he well says, 'de voir où elle en est, pour me servir d'une expression vulgaire.' The result has been the production of a work which, although it will extend at least to five or six thick octavo volumes, will be only a *Genera Coleopterorum*, without the creation of a single new genus, the description of a single species, or the introduction of extended details of anatomy, economy and habits; although the author had made large collections of observations on these branches of the subject, which he has been compelled to suppress.

"A short but excellent introduction furnishes us with the views of the author upon the general classification of the COLEOPTERA, and their distribution into families; in which he gives due honour to

the views of the late lamented Dr. Erichson, and to those of M. Redtenbacher. We must however claim for one of our own countrymen the merit of having broken up the tarsal system, artificial as it was, when applied to the *Xylophaga* of Latreille and other small groups. This was done by Mr. Macleay in the 'Annulosa Javanica,' and it was subsequently adopted and extended by Stephens, in his Systematic Catalogue and Illustrations; in fact, the list of families which M. Lacordaire has given at pages xv and xvi, is almost identical with the arrangement of Mr. Stephens.

"The preceding observations will, we trust, satisfactorily show the character as well as prove the great value of the work before us, which is published at the low price of 5s. 6d. per volume to subscribers.

"The author bespeaks indulgence, in his Preface, for the plates which are to accompany the text, but as yet we have not received any such illustrations."

CONSPECTUS SYSTEMATICUS ORTHOPTERORUM EUROPÆ. Auctore LEOPOLD HENRICO FISCHER of Freiburg. 8vo. Pp. 16. Lipsiæ: GUILIELMUS ENGELMAN. 1854.

A reprint from the same author's large work, "Orthoptera Europæa," containing a list of the species, with indications of their respective "patriæ."

DIE GEOGRAPHISCHE VERBREITUNG DER EUROPAEISCHEN SCHMETTERLINGE IN ANDEREN WELTTHEILEN. Von GABRIEL KOCH. 8vo. Pp. 153. Leipzig: HERMANN COSTENOBLE. 1854. Price 4s. 6d.

A very interesting work, written in German, containing notices of the occurrence of European Lepidoptera in other parts of the world. To those about to visit the East Indies, the Cape, America or Australia, this work will serve as a guide to show which of their old friends they are likely to meet with in 'foreign parts.' Such a work is necessarily incomplete from the want of more numerous observations, but it is an approximation, and as such of extreme value. Too many are deterred from writing for fear of not achieving perfection.

GENERA DES COLEOPTERES D'EUROPE. Par MM. JACQUELIN DU VAL et JULES MIGNEAUX. 8vo. Paris: DEYROLLE, Rue de la Monnaie 19. Price, to Subscribers, 1 fr. 75 cent. per Number. Published bi-monthly.

The following notice is from the pen of Mr. Westwood.

"The first twelve numbers of this work contain the whole of the genera of *Curculionidæ*, with thirty plates, containing 150 coloured figures of types of genera, and 125 pages of text. The *Carabidæ* form the subject of the subsequent numbers. Each genus is represented by a beautifully coloured figure and descriptive text, and catalogues of the European species belonging to each genus."

To be completed in about 86 numbers.

ESSAI SUR LA FAMILLE DES VESPIDES. Par M. H. DE SAUSSURE. Vol. III. 8vo.

Mr. Westwood has obligingly furnished me with the following notice of this work.

"The third volume comprises the social wasps (the solitary wasps *Eumenides*, and the false wasps *Masarides*, being treated upon in the two former volumes). The number of social species is much smaller than that of the solitary wasps, but the plates are rendered very interesting, by the introduction of great numbers of nests of various forms and textures."

FAUNE ENTOMOLOGIQUE FRANCAISE, OU DESCRIPTION DES INSECTES QUI SE TROUVENT EN FRANCE—COLEOPTERES. Par LEON FAIRMAIRE et le Dr. A. LABOULBENE. Small 8vo. Paris: DEYROLLE, Rue de la Monnaie 19. Livraisons I. et II. 1854. Price (of each Livraison) 5 francs.

A descriptive work on the Coleoptera of France being much wanted to facilitate the studies of incipients, this work has been commenced to supply the want. The first livraison of 180 closely printed pages contains descriptions of all the French Carabidæ. The second livraison, of 192 pages, contains the Dytiscidæ, Gyrinidæ, Hydrophilidæ, Histeridæ, Silphidæ, Trichopterygidæ, Scaphididæ, Scydmænidæ, Pselaphidæ, and commences the Staphylinidæ.

In the descriptions the object has been to render them short, but at the same time sufficient to recognize the species treated of. Synonymy is also much curtailed, as however useful in a monograph, being here, where the object was to compress information, out of place. The work aspires to be a Manual of French Beetles; and whilst the Coleopterists of this country are waiting for a good descriptive work on the whole of our Coleoptera, we have no doubt that this French Manual will be extensively used on this side the Channel.*

LINNÆA ENTOMOLOGICA (Zeitschrift herausgegeben von dem Entomologischen Vereine in Stettin). Neunter Band, mit drei Tafeln Abbildungen. 8vo. Pp. 403. Berlin: E. S. MITTLER und SOHN, Zimmerstrasse 84, 85. 1854. Price 6s.

We believe there are few Entomologists in this country, who can read German, who are not already well acquainted with this work, of which a volume has appeared annually since 1846. The ninth volume contains three valuable papers: one for the Coleopterists, viz. a Catalogue of the Asiatic Cryptocephali known up to the present time, by Dr. Suffrian, extending to 169 pages; one for the Hymenopterists, viz., a Contribution to the Knowledge of German Bees, by Dr. Kriechbaumer, of 20 pages; and one for the Lepidopterists, viz., the Depressariæ, and some genera nearly allied to them, described by Professor Zeller, and extending to 211 pages. The names of the different writers are the best guarantee for the value of their respective papers.

HANDBUCH DER ENTOMOLOGIE. Von Dr. HERMANN BURMEISTER. Vol. IV., Part II. 8vo. Pp. 570. Berlin: THEOD. CHR. FR. ENSLIN. 1855.

The following notice of this publication has been kindly furnished me by Mr. Westwood.

"The present part or Abtheilung of Dr. Burmeister's great work is devoted to that portion of the Lamellicorn beetles which feed on leaves, and have the two claws of each foot of equal size and shape, and comprises the five families *Macrodactylidæ*, *Sericidæ*, *Liparetridæ*, *Melolonthidæ* and *Leptopodidæ*, each divisible into numerous

* Foreseeing a demand for this work, I have imported a number of copies, and shall be happy to supply any Entomologist; price of each Part 4*s*. 6*d*.

sub-families, and the whole into not fewer than ninety-three genera, all of which are carefully described with their respective species, often amounting to a considerable number; thus there are fifty-four species of *Ancylonycha*, sixteen of *Melolontha*, thirty-two of *Rhisotrogus*, twenty-four of *Leucopholis*, thirty of *Serica*, twenty of *Diphucephala*, &c. The entire volume offers a striking contrast to the second part of the Catalogue of the COLEOPTERA in the Paris Museum, in which the same families were contained, the meagre and unscientific treatment of which made us even thankful for the rude figures contained in Chenu's volume."

"A Supplement of 100 pages contains—

1. A Memoir on the Natural Relations of the group *Anthobia*.
2. Additions to the *Anthobiæ*, amongst which are introduced the two curious genera *Aclopus*, Er., and *Phænognatha*. Hope.
3. Additions to the farinose and metallic *Phyllophaga*.
4. Additions to the equal clawed *Phyllophaga*; and,
5. On the minute anatomy of the antennæ of the *Lamellicornia*.

"This last supplement is a very remarkable physiological memoir."

There are several foreign works we would willingly have mentioned had our space permitted.

Those desirous of purchasing any of these foreign works will find that Mr. DAVID NUTT, 270, Strand, and Messrs. WILLIAMS and NORGATE, 14, Henrietta Street, Covent Garden, will promptly execute orders they may receive.

LIST OF ENTOMOLOGICAL BOOKS

NOW ON SALE IN LONDON.

(By the Editor.)

During the past year I have had very many applications from Entomologists (both young and more advanced), inquiring what books I would recommend for particular branches of the study. There are probably many who would like such questions answered without the trouble of putting them. I have, therefore, compiled a list of all the Entomological books I can ascertain to be now on sale in London; for this purpose I forwarded circulars to the various publishers, inquiring what Entomological books they had in stock, and the price. To my certain knowledge many an Entomologist is in want of some particular book, but is not aware that it is on sale, or where it is to be had, and at the same time the bookseller complains there is no demand for Entomological books. This is sheer nonsense; if the existence of the books were *made known to those in want of them they would go off fast enough.*

In enumerating these books now on sale I have appended to each of those I felt competent to pronounce upon, a short critical sentence, in order that my readers might be able to gather my opinion without the trouble of writing to me on the subject. I am perfectly aware that these opinions are of very doubtful value, but such as they are they are given with no desire to sell individual books, or to cut up living authors, or to display my own cleverness; my wish has been—

> "Nothing to extenuate,
> Nor aught set down in malice."

The publisher's name appended is either that of the original publisher or that of the party who purchased the stock of the work from the original purchaser. It indicates in each case the house to which those ordering any of the works here enumerated should refer their bookseller.

INTRODUCTORY WORKS ON ENTOMOLOGY.

EPISODES OF INSECT LIFE. First Series, distinct and complete in itself. Price 9s., or with Coloured Plates, 14s. BOHN.

EPISODES OF INSECT LIFE. 3 vols. Crown 8vo. With Illustrations, £1 : 7s.; or with Coloured Plates, £1 : 16s. BOHN.

Written in a graphic and humorous style, and well fitted to attract the attention of those ignorant of such matters to the marvels of Entomology.

FAMILIAR INTRODUCTION TO THE HISTORY OF INSECTS. By EDWARD NEWMAN. 1 vol. 8vo. With numerous Illustrations. Price 12s.

VAN VOORST.

The histories of individual insects, as given at pages 1—72, are among the best specimens of insect histories we have—correctly given, and in an amusing and entertaining style. We can cordially recommend this portion to incipient Entomologists. The chapters "On the Collection and Preservation of Insects" are now quite obsolete, and those who act on the suggestion of applying to the pin makers, &c. recommended, will only lose their time and postage stamps. The chapters on Classification of Insects should be shunned by all *young* Entomologists, but being extremely dry we have no doubt they will skip them; by *older* Entomologists they may be read with profit.

INTRODUCTION TO ENTOMOLOGY. By DUNCAN. Forming one volume of JARDIN'S NATURALIST'S LIBRARY. In red cloth boards. 4s. 6d. BOHN.

This contains a good general outline of Entomology, comprised in pages 67—201; it is necessarily rather brief, and to those unlearned in the subject rather dry. After the introductory portion several of

the orders (Orthoptera, Hemiptera, Neuroptera, Hymenoptera and Diptera) are treated of separately.

INTRODUCTION TO ENTOMOLOGY. By KIRBY and SPENCE. 2 vols. 8vo. With Coloured Plates. £1 : 11s. 6d. LONGMANS.

Interesting to all classes of readers, but extremely so to the initiated: the subject is arranged systematically under distinct heads, thus:—Metamorphoses of Insects; Direct Injuries caused by Insects; Indirect Injuries caused by Insects, 1° to our living animal property, 2° to our living vegetable kingdom, 3° to our dead property, whether animal or vegetable; Indirect Benefits derived from Insects; Direct Benefits derived from Insects; Affection of Insects for their Young; Food of Insects; Habitations of Insects; Societies of Insects; Means by which Insects defend themselves; Motions of Insects; Noises produced by Insects; Luminous Insects; Hybernation and Torpidity of Insects; Instinct of Insects.

POPULAR BRITISH ENTOMOLOGY. By Miss CATLOW. 1 vol. 2nd edition. Royal 16mo. With 16 Coloured Plates. Price 10s. 6d. L. REEVE.

To give a *young hand* an insight into Entomology, there is probably no better work than this extant. It contains recognisable coloured figures of twenty-three of our sixty-six species of British Butterflies, besides figures of various other insects.

WORKS ON ENTOMOLOGY IN GENERAL.

CURTIS' BRITISH ENTOMOLOGY. 16 vols. 8vo. £21. Now being re-issued in Monthly Numbers, 3s. 6d. each. L. REEVE.

All Entomologists agree in declaring the Plates in this Work to contain the best Entomological Figures extant—they are 768 in number, embracing all the orders, and representing a species in each of the more important genera. The letter-press is short in quantity, and very deficient in quality, and in fact had better be considered as not there. The Tyro would be led into numberless errors by resting his faith upon it.

SHUCKARD AND SWAINSON'S INSECTS. 1 vol. foap. 3s. 6d. LONGMANS.

We cannot give an opinion on this work: we attempted to read it, but found so much absurd nonsense we had no patience to continue.

STEPHENS' ILLUSTRATIONS OF BRITISH ENTOMOLOGY. Complete in 12 vols. 8vo. With Coloured Plates. £8:8s. BOHN.

This work was intended to describe systematically all the British species of insects known at the time it was written 1827—1835: the orders Hemiptera and Diptera were however not included, and only a portion of the Hymenoptera were given. The descriptions, unfortunately, are to a very great extent not made from actual specimens, but compiled from previous authors, and frequently a description is thus applied to an insect for which it was never intended. The articles of habits and localities are frequently extremely interesting. Mr. Stephens was an indefatigable and very successful collector.

With all its faults, it is the most complete descriptive work on general British Entomology we have.

WESTWOOD'S INTRODUCTION TO THE MODERN CLASSIFICATION OF INSECTS. 2 vols. 8vo. With 133 Illustrations on Wood. Cloth. 18s. BOHN.

For giving an Entomologist a general view of the Insect World, no work is better suited than this. It may be too learned for the general reader, but even he will find much in it to interest him. It may be to a great extent a compilation, but to arrange systematically the observations of previous unsystematic writers is a useful sort of compilation. At the price at which this is now offered, the cheapness of this work is marvellous.

WORKS ON BRITISH LEPIDOPTERA.

DUNCAN'S BRITISH BUTTERFLIES. Forming one volume of JARDINE'S NATURALIST'S LIBRARY. In red cloth boards. Price 4s. 6d. BOHN.

DUNCAN'S BRITISH MOTHS. Forming one volume of JARDINE'S NATURALIST'S LIBRARY. In red cloth, boards. Price 4s. 6d. BOHN.

"The Butterflies" is a very complete work, and well written throughout: it is now rather out of date, containing the varieties of the White Butterflies as distinct species and other errors of twenty-years ago: the introductory portion of both volumes is good and well worth reading: "The Moths" is not so complete a work, and therefore of little use.

HARRIS' AURELIAN. New Edition. By J. O. WESTWOOD. 1 vol. Small folio. With 44 Coloured Plates. Half bound morocco. Price £4: 4s. BOHN.

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The letter-press is inferior to Stephens, and the plates far inferior to Wood: the important distinguishing feature is the figures of the larvæ: these are copied from various foreign works, and where the foreign author had mistaken or confused two larvæ the error is repeated. The latter part of the second volume is probably a good sample of how badly a scientific book may be written, by an unscrupulous author, with little knowledge of the subject, copying wholesale from previous authors, who were themselves not trustworthy. We trust the day when such books *can* be written on Entomology is now past—an inquiring spirit is abroad—which will not accept such trash, even though in the form of quartos, half bound in morocco.

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OF

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Those who may make any discoveries or captures of importance are requested to communicate at once to the Editor (Mr. H. T. STAINTON), and all authenticated intelligence received by him prior to 8 p.m. on the Wednesday, will be published in the "Intelligencer" of the following Saturday; and each contributor of important information will receive *gratis* a copy of the paper in which it appears.

Those who wish the "Entomologist's Weekly Intelligencer" forwarded by post on the day of publication are requested to transmit 4*s.* in postage-stamps to the Editor, on or before March 1st, 1856, in order that the necessary arrangements may be made for transmitting the requisite number of copies; those subscribing between March 1st and 15th will be liable to a subscription of 4*s.* 6*d.*, and all after that date 5*s.*

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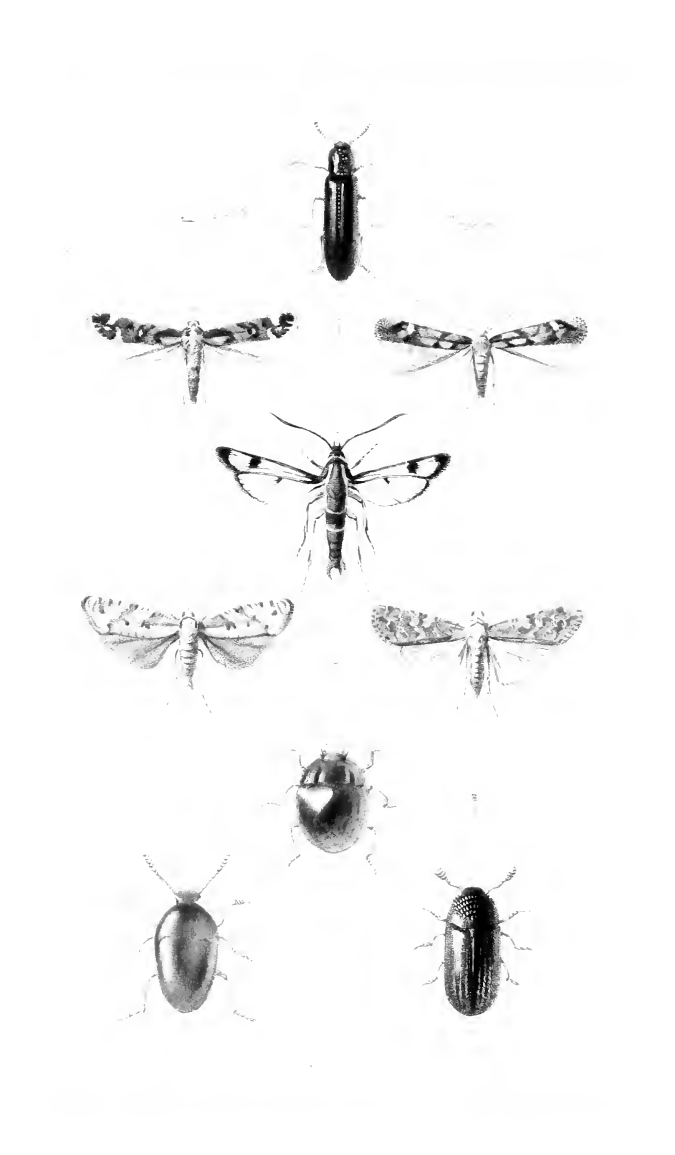

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PREFACE.

On this our third appearance before the public, we assume a triple form—in other words the present Annual is issued simultaneously in three editions.

The Library Edition in cloth gilt, printed on superior paper, and with more carefully coloured plate.

The Original Edition in yellow boards as heretofore, and The People's Shilling Edition in thick paper wrapper, with uncoloured plate.

By this method we hope to reach, though we fear we cannot expect to satisfy, all classes of readers, and we trust it will be found that there is no falling off in the amount of interesting matter provided by our contributors.

At the present day, when so much stir is being created at the neglect which all orders of insects, save the Lepidoptera and Coleoptera, experience from British Entomologists, a Synopsis of the British Dragon-flies, from the pen of so competent an authority as Dr. Hagen, will be welcomed as a real step towards further progress.

Mr. Janson's paper on Ants'-nest Beetles will be read with interest by many who have never yet troubled themselves with that curious page in Natural History, "the love of the ant for the beetle."

We apprehend that on our next appearance we shall be compelled to enlarge our size; we shall probably then have more than one new contributor, and more than one group of

insects, hitherto neglected, will probably be made the basis of an article. If the anticipated expansion in bulk takes place, we do not see how we can prevent an increase in price. At present, though we print three thousand, no margin of profit is left, and any outlay in advertising entails a loss.

If our readers should decide for us that we might safely print even a larger issue, we would willingly increase in bulk without any additional charge—but time will show.

A year hence the cheap Edition of Kirby and Spence, of which the fourth thousand is already advertised, will have had time to produce fruit, and to swell our crop of readers.

The "Times" recently, in an article on Book-Hawking, asks "what becomes of the gift of reading among the labouring poor of this country?" and then, commenting on the class of books which are hawked about the country, observes, "that though book-hawking may supply only the vilest trash, it is in itself a natural machinery for supplying the country poor with literary food. The poor will buy books; and if they have any money to spare from their household expenses, little as it may be, this is a very good use of it, provided the books be good. It is much better, too, that they should buy books than that books should be given in charity. People value what they buy a great deal more than what comes to them by mere official charity." This is *very* true.

In another column of the "Times," of the same day, we find another article on the same subject, from which we quote the following: "Many there are who would turn away from a professedly religious book, who might yet be tempted by some useful or entertaining secular work." And this as true of *scientific* books as of *religious* works.

A writer in the "Times," a few days later, alluding to this

very paragraph, remarks, "The great fault of those who choose books for the working classes is in their desire that they shall read none but "good books;" that is, as they the choosers would express it,—"books which should contribute to the religious and moral improvement of working men." The greater part, therefore, are religious books, and the remainder no doubt highly moral and instructive; but, unhappily, just the sort that the majority of working men would open only to shut again, after glancing over half a page. It is entirely forgotten that a taste for reading is yet to be created among working men. To give such religious book or books inculcating morals simply, without their being at the same time very entertaining—a quality often deemed improper for labouring people—is only to make them feel a disgust for reading."

"Labouring men, and workmen generally who do read, are affected by reading precisely the same as the classes above them. They are entertained with the narration of what they can understand and appreciate, and oppressed with dulness or 'bored' with what they do not understand or appreciate. Books, therefore, for their use must be highly entertaining, if you would have them voluntarily read or purchase them. But as with the greatest number a taste for reading has yet to be created, books must be procured for them of a sufficiently engrossing tendency to their minds to overcome the distaste, or perhaps the difficulty, of reading them."

It may seem strange to some that we should say so much about "book-hawking" in these pages; but we have repeatedly felt the difficulty which some of our poorer readers have in getting possession of our works. They get to hear of them in some round-about way, and want to procure them, but the bookseller in the nearest village or town, when ap-

plied to, has not the "Entomologist's Annual" in stock, perhaps he has not even heard that there is such a publication,—and is it natural that he should be at the trouble of specially procuring from London a book which he fears he may never sell? for the party applying for it at the time is a perfect stranger to him and may never enter his shop again; the applicant, on the other hand, does not like the notion of making a deposit beforehand of the price of the book, and so we lose a reader and our friend misses the instruction he was anxious to obtain.

I hope that all who wish for any information on Entomological subjects will still, without hesitation, continue to apply to me.

H. T. STAINTON.

Mountsfield, Lewisham,
December 4th, 1856.

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8. *Adelops Wollastoni*, see page 70.
9. *Cryphalus binodulus*, see page 83.

"In former times there were many men eminent in all the branches of human learning, but, as regards the great masses of mankind, the avenues of knowledge were to a certain degree closed; but the arrangements of later periods, which are improving from day to day, tend to diffuse among the great mass of the community, or, at all events, among all who are willing to receive instruction, the results of the labours of science and the fruits of the investigations of the learned.

"The intellectual qualities, as well as the moral feelings of our nature, are scattered broadcast over the face of the earth. We find them everywhere, in the lowest classes as in the highest." *Lord Palmerston, at Manchester, November 6th,* 1856.

ERRATA.

Page 47, line 6 from bottom, *after* "Harris's figure" *insert* "(Exposition, pl. 27, fig. 2)."
„ 51, line 19, *for* "*Æschnia*" *read* "*Æschna*."
„ 55, line 10 from bottom, *after* "(♂);" *insert* "(♀)."
„ „ line 2 from bottom, *after* "(♂);" *insert* "(♀)."
„ 57, line 4 from bottom, *after* "Dublin" *insert* "University."
„ 63, line 10 from bottom, *for* "Whitsund" *read* "Whitsand."
„ 64, line 2, *erase* "Dej. Spec."
„ 70, line 14, *for* "Fig. 7" *read* "Fig. 8."

THE SEASONS.

(By the Editor.)

It is well for Entomologists it is not always summer. Summer is to the eager collector a period of such intense activity,—moths to be found here, beetles there, caterpillars in other directions, then insects coming out in the breeding-cages, insects spread out on the setting-boards, live insects too,—those horrid mites running about on the setting-boards rubbing off a leg here, an antenna there, or, if the insect be very precious, carefully removing the wings,—(the clever rascals)—that it is well the duration of summer is limited; few would like to have to work for even six months at the full summer high-pressure rate.

A member of parliament in July can have some conception of the labours devolving on an Entomologist during the summer months; but, unfortunately, the M. P.'s labours are of a less exhilarating nature: whilst he is drearily dozing over an endless and unmeaning debate, the Entomologist is more pleasantly employed in culling his moths from his sugared trees; he is in the open and fresh air of the woods and heaths, unexposed to the ventilating draughts which a Reid inflicts upon the Commons—his acquaintance with reeds is limited to those growing in marshes; though it strikes one as not improbable that in days long gone by, *Wainscots* and other marsh insects must have occurred freely between

Westminster and Milbank, and probably the very ground on which the Penitentiary stands served as their metropolis.

When the M. P. sits down to his daily digest of blue-books, the Entomologist is busy setting out his captures of the previous evening; when at 11 A.M. the M. P. goes to the House to attend a committee, and amuse himself with hearing a witness examined for three or four hours, the Entomologist (supposing he had nothing else to do, which is, in fact, however fortunately rarely the case) sallies forth and proceeds to interrogate nature, by peering over the mossy trunk of a tree, beating the branches and raking in the roots of the grass—and whether he finds any thing, or merely finds indications of where something has been, all is gain to him, and on his return home he forthwith opens his journal and makes an entry of what he has seen and met with.

The post arrives: to the M. P. it brings budgets of letters, some from his constituents asking for all imaginable and unimaginable things (just as we are often asked for a small *cheap* book with *coloured* figures and descriptions of *all* our British insects); to the Entomologist it brings packets of letters applying for some rarity of which he had announced the capture in the previous Saturday's "Intelligencer." Alas! a great number of the letters received both by the M. P. and the Entomologist show but too clearly the selfishness of the writers.

Winter is not a period of the year in great favour with Entomologists, but it is not without its uses. Things which we least appreciate are often of the greatest service to us. Now, in the good old times of farming, fields were allowed to be fallow at certain intervals, in order to recruit the exhausted condition of the ground—a fallow field was itself unproductive, but was destined to be the cause of greater

production hereafter—so with the winter of the Entomologist: the almost entire cessation of out-door Entomological labours drives him to look over and *study* his collection, and sets him a re-reading his Entomological books, and he is surprised to find how much more pregnant with meaning they now appear than they did the previous winter; many passages of which he did not gather the full purport before, now he at once understands, because they confirm some of his own experience during the past season: he makes notes of insects to be looked for at particular times and in particular places during the ensuing season, consults the herbarium of some friend, and rubs up his Botanical knowledge in order that he may learn to know some particular plants, on which he finds some caterpillars are only to be found. Grant that during mid-winter the Entomologist says daily, "Oh! I wish it were summer!" Yet that very wish drives him to work harder at his studies in order that when summer comes he may be the better prepared for it. The summer he knows goes but too quickly, and there is hardly a possibility of finding time during the summer to rummage books and see what one should be looking for; those who are wise will get all this book-work done beforehand, and those are wise who are not given to *procrastination*.

Nor let it be for a moment thought that these remarks about study and making notes are addressed only to our elder readers. Our own literary labours commenced before we were fourteen, by the compilation (from Rennie's Conspectus) of a Calendar of British Butterflies and Moths, which showed under each month the species occurring in that month, whether they were plentiful or scarce, and in what parts of the country they occurred. This list filled six copy-books, and though not intended for publication, only for our own private use, proved to us most serviceable; and we strongly

recommend such of our juvenile readers as want some occupation for their *winter evenings* to try the same or some similar dodge. By writing a thing out yourself, you learn it more thoroughly than by merely reading it (don't you find this so, when you have to write out your lessons ?), and you will soon acquire a habit of tabulating any information which you wish to have clearly placed before you.

As winter advances, the feeling of intense anxiety to be *doing* something increases in the Entomologist to an almost morbid degree, and the first tolerably tempting day in January or February you are sure to see him a-field.

Spring comes, and then the Entomologist emerges, as it were, from his long pupa state, and enjoys all the pleasures of a new existence. He is a year older and a year wiser than he was the spring of the previous year: to the experience of the preceding spring and summer, he has added the knowledge gained by his winter studies; and though in no great hurry to think that he knows everything, he finds the immense advantage of the increase of knowledge he has obtained in the twelve months. This is the great charm of knowledge; the pleasures of that we have acquired, urge us to increased industry in adding to our store. Were summer to come immediately after winter, the transition would be so great that the Entomologist would not have time to adapt himself to the altered state of things; but by the gradual advent of spring, he has the opportunity afforded him of bit by bit accustoming himself to a complete change of occupation. The very variableness of the weather too in spring is not without its uses in trying the steadiness of purpose of the Entomologist: by persevering in collecting during the cold ungenial weather of April, and facing sundry cool showers of rain and sleet, he testifies that there is some *stuff*

in him, and it is only when it meets with obstacles and overcomes them, that we appreciate the full force of any strong current. Besides, this same ungenial temperature, which often comes suddenly after a week of pleasant balmy weather, enables the Entomologist to cultivate a cheerful disposition; like Mark Tapley, he can then show whether he has the capability of being "jolly" under aggravating circumstances; it is quite absurd to say you can cultivate cheerfulness when everything goes smoothly—it is when things will perversely go wrong, that one's philosophy gets put to the test.

Moreover, the Entomologist must be sharp indeed, if he has not put off some of the winter's work to the last, and probably he finds, as the labours of the spring season begin to press upon him, several matters of importance had been overlooked in the winter, but which yet it will be desirable to get completed before the summer sets in, in full earnest. But, alas! how few have the foresight and industry to get all their work ready beforehand.

Autumn, though it has less to be distinctively said of it than the previous seasons, cannot be passed altogether unnoticed. Long ago we remember we used to slacken our Entomological energies towards the close of the season, and used to pass unheeded in October moths, which we should have eagerly chased in March; as it was with us then, perhaps it now is with many of our readers. At the close of the day one gets lazy and indisposed to work, at the close of summer a like feeling of drowsiness overtakes the incipient Entomologist. Of course we can understand that what with "Intelligencers," "Naturalists," "Substitutes" and "Zoologists," it is less easy to drop off quietly to slumber than it was in our juvenile days, when such things were unknown. Yet autumn is a prolific time for many things, and those

who are energetic will find that though one has much "game" to look after out of doors,—for is not the ivy in bloom in October and November? the arrangement of summer captures, and determination of the names of species, will afford plenty of in-door occupation; so that those who wish to be Entomologically employed can amuse themselves both with summer-work and winter-work.

IS ENTOMOLOGY PROGRESSING?

(By the Editor.)

An apparent increase of crime may be caused by a greater efficiency of the police. More criminals will be captured, more will be tried, and more will be convicted: statistical tables will show, to the horror of the civilized portion of the community, *a great increase of crime*, whereas after all the increase is not in the *crimes committed*, but in the *criminals detected*.

In like manner many persons are apt to take up the idea that a greatly increased number of persons are now occupying themselves with Entomology, simply because, owing to the greater efficiency of our Entomological police, a collector can hardly make a day's excursion without finding his doings in print. So that the apparently increased activity of our collectors may only arise from the movements of each being noted.

That this publication of each other's movements reacts favourably upon Entomologists may readily be admitted: it produces the sympathy of a crowd; each finding himself no longer isolated, and working only for his own amusement, finds himself placed in a higher and more unselfish position; he works now for the amusement and instruction of others as well as for his own.

Each collector may thus be led to more vigorous exertions, and an increased crop of insects will be found in his store

boxes at the end of the season; for till one gets to know of those who are in want of one's duplicates, but little attention is paid to the collection of them.

But granted that each collector is more active, and granted even that there are a few more collectors than formerly, still we may recur to the question—Is Entomology progressing?

Entomology is the study of insects; the collector catches insects, but it does not follow that he studies them; to assume that an increase in the number of collectors necessitated the progress of Entomology, would be as rational as to assert that Mineralogy was now making vast advances, because so many had gone to the gold-diggings of California and Australia.

In 1850 the following passage appeared in the pages of the Zoologist.

"I imagine all persons commence a collection of insects with the notion that they are thereby making something pretty to look at. Yet, the desire to have them named and arranged, treads very closely on the heels of the desire to form a collection. And this naming and arranging is no child's play, no baby-work: if they are to be named, they must be named correctly; if they are to be arranged, whose arrangement should be followed? In the first place, how is the collector to ascertain the names of the species he has collected? He may consult books, and refer to descriptions or figures, or he may compare specimens with some collection which is supposed to be rightly named; and nine-tenths of our collections, I regret to say, are named in this latter way: they are copies of copies; they have never been compared with the original; if there was a blunder in the copy, still they copy it, having no notion of correcting it. The consequence has been that our collections of *Lepidoptera*, and

probably of other orders, were a disgrace to the age and to the country. This is now to be rectified; a new catalogue of British *Lepidoptera* (except the *Fumeæ*) has appeared: all collections are to be named and arranged by this,—but are they not still all to be copies? Who refers to the original descriptions to prove their correctness? Every one takes on trust the saying of this or that Entomologist, and names his cabinet accordingly. Why is this so? This is an inquiring age: we do not generally take things on trust in this way, but we make diligent search and inquiry in order to prove them."

The evil here complained of still exists. But very few dive into the literature of Entomology, but very few devote themselves to the analysis and correction of genera. Nay a recent writer in the Natural History Review is actually so violently opposed to the further study and consequently improved arrangement of a group of insects, that he energetically protests against any re-arrangement, because it will be so inconvenient to our collections; a collection is not to be used for the furtherance of science, but is to form a bar to its progress. We have often been accused of being severe upon our countrymen, but we were never guilty of so great a libel on them as the reviewer in question. The Natural History Review, we may observe *en passant*, has done wisely to import its best paper from abroad, so great is the lack of Entomological writers in this country.

A fair idea of the crop of Entomological writers may be formed by referring to the papers published in the Transactions of the Entomological Society of London. It is well known that every paper read before that society is referred to a committee called the Publication Committee, which decides whether or not the paper is worthy of publication; so that the list of contributors may be assumed not to be a

list of mere scribblers, but to be restricted to those who have elaborated something of scientific value.

The following is the list of contributors to the Transactions of the Entomological Society, in each year from 1846 inclusive.

1846..	Rev. F. W. Hope *J. W. Douglas, Esq.* J. O. Westwood, Esq. R. Templeton, Esq. *Rev. T. Savage*	5 Contributors; of whom 2 were new.
1847..	J. W. Douglas, Esq. W. W. Saunders, Esq. J. O. Westwood, Esq. J. E. Gray, Esq. W. F. Evans, Esq. *Dr. Schaum*	6 Contributors; 1 (a foreigner) new.
1848..	J. O. Westwood, Esq. J. W. Douglas, Esq. *W. S. Dallas, Esq.* Edward Doubleday, Esq. *William Wing, Esq.* *H. T. Stainton, Esq.*	6 Contributors; 3 new.
1849..	J. F. S. Parry, Esq. W. S. Dallas, Esq. J. O. Westwood, Esq. W. W. Saunders, Esq. *Thomas Desvignes, Esq.* J. W. Douglas, Esq. H. T. Stainton, Esq.	7 Contributors; 1 new.
1850..	H. T. Stainton, Esq. F. Smith, Esq. S. S. Saunders, Esq. Adam White, Esq. J. W. Douglas, Esq. W. W. Saunders, Esq. *W. C. Hewitson, Esq.*	7 Contributors; 1 new.
1851..	J. W. Douglas, Esq. W. S. Dallas, Esq. H. T. Stainton, Esq. W. W. Saunders, Esq. J. O. Westwood, Esq. F. Smith, Esq. *R. F. Logan, Esq.* *John Davy, Esq., M.D.*	8 Contributors; 2 new.

1852..	J. W. Douglas, Esq. J. O. Westwood, Esq. *John Curtis, Esq.* F. Smith, Esq. W. S. Dallas, Esq. W. C. Hewitson, Esq. W. W. Saunders, Esq. *H. W. Bates, Esq.* S. S. Saunders, Esq.	9 Contributors; 2 new.
1853..	W. Wilson Saunders, Esq. *Mr. W. Varney* G. R. Waterhouse, Esq. J. W. Douglas, Esq. F. Smith, Esq. J. O. Westwood, Esq. *A. R. Wallace, Esq.* *John Scott, Esq.*	8 Contributors; 3 new.
1854..	W. C. Hewitson, Esq. Edward Newman, Esq. John Curtis, Esq. John Davy, Esq., M.D. W. W. Saunders, Esq. J. O. Westwood, Esq. G. R. Waterhouse, Esq. H. T. Stainton, Esq. F. Smith, Esq. *J. S. Baly, Esq.*	10 Contributors; 1 new.
1855..	G. R. Waterhouse, Esq. *E. W. Janson, Esq.* F. Smith, Esq. *J. G. Desborough, Esq.* J. O. Westwood, Esq. E. Newman, Esq. *John Lubbock, Esq.*	7 Contributors; 3 new.

Thus in the years 1846—1850, the average number of contributors per annum was $6\frac{1}{5}$, and in the five years eight new writers made their début.

In the second period of five years 1851—1855, the average number of contributors per annum was $8\frac{2}{5}$, which includes eleven new writers; an increase in both respects of one-third. Taking therefore this as a criterion, we may infer that Entomology *is* progressing.

Yet at the same time the progress is not great, and by no means to the extent that is actually desirable. Either Entomologists are not clever, or clever men do not become Entomologists; a disagreeable statement no doubt, but one from which apparently there is no escape, and we never shirk stating the truth, just because it happens to be unpleasant.

At the present day the collectors of beetles in this country want a clever man to write them a Manual of British Beetles; and whether we hunt high or low amongst our Coleopterists, the fitting man cannot be found. Surely this state of things will not always last!

SUPPLEMENTAL LIST

OF

BRITISH ENTOMOLOGISTS.

(By the Editor).

The List of Entomologists in last year's Annual having been generally accepted as one of the most useful portions of that periodical, a Supplemental List is now given of all those Entomologists whose names and addresses have reached us since last year, and who were not unwilling to be thus enumerated. Very few of these were *desirous* of being thrust upon the public; we had to seek them out in their retreats, pathetically appeal to the Entomological patriotism, and then came the modest reply, "I should not have thought myself worthy of being classed amongst Entomologists, but if you think any good purpose would be served by the insertion of my name in your Supplemental List, I leave you to do as you think best;" so that the whole responsibility of publishing this list has been thrown upon our shoulders.

However we entertain no qualms but what it will be beneficial: each unit thus obtains a better chance of being thrown in contact with other units of similar dispositions. An amusing result of our last year's list has become known to us. Two gentlemen were on visiting terms and had known one another for some years, but neither had any idea that the other collected insects, till one of them finds his friend in our

"List of Entomologists;" thereupon the next time they meet there ensues the following conversation:—A. says to B., "I had no idea you collected insects." B., "Oh! yes; I have been collecting many years; have you any taste that way?" A., "Yes; and I have often wanted to meet with a kindred spirit, and little thought that you were one."

A good many of our new names are school-boys; in our eyes this enhances rather than detracts from the value of the list. Each "incipient Cuvier," who finds his name thus paraded to the public gaze, will feel that he cannot relax his efforts without discredit, that to have had a fever for one pursuit and afterwards to have grown cool therein will be a damaging blow to his character for perseverance, which he will not be disposed rashly to encounter.

The following alterations have taken place in the Address or Title of the Entomologists enumerated in our last year's List:—

Changes of Address.

Buxton, E. C., Esq., *Daresbury* Hall, near Warrington.

Drane, Robert, *22, Frederick Street, Cardiff.*

D'Urban, W. S. M., Esq., *Canada.*

Hodgkinson, Mr. J. B., 41, St. Peter's *Street,* Preston.

Plint, Henry, Esq., *25, Tokenhouse Yard, London.*

Reading, J. J., Esq., *42, Gibbons* Street, Plymouth.

Shield, Mr. Richard, *9, Shrub Place, Leith Walk, Edinbro'.*

Smith, Frederick, Esq., British Museum, and *27, Richmond Crescent, Richmond Road, Islington.*

Wollaston, T. Vernon, Esq., *10, Hereford Street, Park Lane.*

Changes of Title, &c.

Bostock, *Rev.* G. J., *Bideford, North Devon.*
Hogan, *Rev.* A. R., *Corsham, Wilts.*
Jones, *Captain* John M., *Dolarddyn Hall, near Welshpool, Montgomeryshire.*
Newnham, *Rev.* P. H., *Guildford,* Surrey.
Norman, *Rev.* Alfred Merle, Christchurch, Oxford.

Supplemental List of British Entomologists.

*Marked * are willing to assist young beginners with specimens or information.*

Alington, A. M., Candlesby Rectory, Spilsby, Lincolnshire.
Allen, William, Western Terrace, The Park, Nottingham. *Coleoptera and Diptera.*
Allen, C. F., Western Terrace, The Park, Nottingham. *Hymenoptera.*
Andrews, Percy, Esq., 17, Montpelier Villas, Brighton. *British Lepidoptera.*
Archer, F., Jun., 49, Rodney Street, Liverpool.
Aris, H., 149, St. John Street, West Smithfield.
Aubertin, Edmund, 8, Charing Cross. *British Lepidoptera.*

Baker, Henry, 90, Hatton Garden. (*Glass Tube Maker.*)
Baker, Mr. Richard, Brockenhurst, New Forest, Hants. *British Lepidoptera.*
Baker, William, New Road, Abergavenny.
Balding, Mr. James, Wisbech.
Banks, E., at Mr. Stubbs', 1, Sadler Street, Durham.
Barker, William, Church Fold, Kirkstall, Leeds.
Barrett, Mr. C. G., 37, Park Street, Mile End.
Bartlett, Rev. J. P., Exbury Parsonage, near Southampton.
Barton, W. H., Rev. W. Metcalfe's, Brockdish, Scole, Norfolk.
Bateman, H. William, 6, Islington Green, London. *British and Foreign Lepidoptera and Coleoptera.*
Berry, John, Duke Street, Beeston Hill, Holbeck, Leeds.

*Bingham, Seymour, Esq., Bank, Newnham, Gloucestershire. *British Lepidoptera.*

Binning, Mr. (Mr. Roakes, Pawnbroker), 13, Bartholomew Street, Newbury, Berks.

*Birchall, Edwin, Esq., 27, Eden Quay, Dublin. *British Insects of all Orders.*

Birks, Mr. John, 4, Market Street, York.

Black, Mr. John, 23, Justice Street, Aberdeen.

*Blackmore, Trovey, Wandsworth. *British Lepidoptera.*

Boggis, Rev. W. R. T., Curate of Lilley, near Luton, Beds.

Bolitho, Edw., Arnold Point, No. 3, Cottage, Embankment Road, Plymouth. *Coleoptera and Lepidoptera.*

Bolt, Henry, 6, Clarence Place, Kingsdown, Bristol.

Bolt, John, Broad Street, Bristol.

Boot, Alfred, Esq., 16, Park Row, Greenwich. *British Insects of all Orders.*

Boscher, E., 3, Prospect Villas, Twickenham.

Bouchard, Mr. Peter, Marling Pits Cottage, Sutton, Surrey. *Collects for Entomologists, and sells.*

Boulaye, Mr. W. Galbois de la, 80, Dover Terrace, Lloyd Street, Greenheys, Manchester.

Bowman, Mr. Jesse, Stanhope, via Darlington.

Braikenridge, Rev. Geo. Weare, Broomwell House, Brislington, near Bath, and Clevedon, near Bristol.

Braund, Mr. E., Martock, near Ilminster, Somersetshire. *British Lepidoptera.*

Bray, Edwin. Esq., Senior Lane, Hunslet, Leeds,

Bree, Rev. H., Wolverstone, Ipswich.

Bremner, Dr. James, Jun., Duke Street, Huntley, Aberdeenshire.

Bristow, John, Esq., Prospect, Belfast. *Irish Lepidoptera.*

Browne, H. W., 1, Westbourne Street, Hyde Park Gardens. *British Lepidoptera and Coleoptera.*

Brydges, C. E., 4, Priory Terrace, Cheltenham. *British Lepidoptera.*

Buckler, William, Lumley Cottage, Emsworth, Hants.

Buckton, Frederick, 6, Beech Grove Terrace, Leeds. *British Lepidoptera.*

Bungey, Mr. Thos. J., Spennymoor, near Ferry Hill, Durham.

Butterfield, Rev. H., M.A., Fulmer Rectory, Gerrard's Cross.

CAMPBELL, ANGUS, 6, Cave Terrace, Crescent Road, Plumstead, Kent. *British Lepidoptera and Coleoptera.*

CAMPBELL, THOMAS, Congreve Street, Birmingham.

CANHAM, Mr. THOMAS J., 29, South Street, Cambridge.

CANHAM, Mr. THOMAS, Jun., 6, John Street, City Road, Cambridge.

CARTER, Mr., 42, Crouch Street, Colchester.

CARTMEL, RICHARD, 13, William's Grove, Walworth.

CASWALL, Mr. R. C., Fighelden, Amesbury, Wilts.

CHALMERS, J. H., Esq., 14, Union Terrace, Aberdeen.

CHANEY, Mr. W. C., 20, Upper Britton Street, New Brompton, near Chatham.

CHAPMAN, ALGERNON, 114, Bothwell Street, Glasgow. *British Lepidoptera.*

CHAPMAN, THOMAS, 56, Buchanan Street, Glasgow. *British Lepidoptera.*

CHAPPELL, JOSEPH, 2, Partington Street, Tontine Street, Salford.

CLARK, JOHN, Raglan House, Regent Street, Cheltenham. *British Lepidoptera.*

CLARKE, THOMAS, Bedern Bank, Ripon.

CLARKE, WILLIAM, Holme, near Stilton, Hunts.

CLAYTON, E. G., 47, Waterloo Street, Brighton. *British Lepidoptera.*

CLOWES, Mr. G. A., Ashbocking Vicarage, Needham Market, Suffolk.

CONSTANTINE, W. L., 7, St. Andrew Street, Blackburn, Lancashire. *British Coleoptera.*

COOK, ROBERT, Esq., 79, Long Westgate, Scarborough. *British Lepidoptera.*

COOKE, BENJAMIN, 49, Ardwick Place, Manchester. *British Insects of all Orders.*

COOKE, Mr. NICHOLAS, 6, Wentworth Street, Everton, Liverpool.

COWMEADOW, Mr. JAMES, Jun., Newnham, Gloucestershire.

COX, W., Esq., Uttoxeter Road, Derby.

COXON, Mr. JOHN, Sun Place, Sodom, Holbeck, near Leeds.

CRACKNELL, JAMES, Essendon, near Hatfield.

CROTCH, W. D., Esq., Cemmaes, near Shrewsbury.

CROTCH, G. R., Esq., 2, Albert Buildings, Weston-super-Mare.

CROZIER, H. D., Esq., Seafield, Donnybrook Road, Dublin.

CRUMP, THOMAS LACY, Winchcomb. *British Lepidoptera.*

CUNDALL, ROBERT, Crown Point, Coal Staith, Leeds.

Dawson, Samuel Taylor, Esq., Botesdale, Suffolk.
Draper, W. H., Chichester.
Duke, F., Brighton College.
Durand, Mr. J. L. E., Postern Street, Nottingham. *British and French Lepidoptera and Coleoptera.*
Dyson, David, 17, Newall's Buildings, Manchester.

Eales, Christopher, 8, King Street, Darlington. *British Lepidoptera.*
Edmondson, Mr. James, Plymouth Grove, Manchester.
Edmondson, Mr. Townley, Plymouth Grove, Manchester.
Edon, R., East Sheen, Mortlake, Surrey.
Edwards, George, 24, Acacia Road, St. John's Wood. *British Coleoptera and Hymenoptera.*
Edwards, Mr. J. A., 57, Camden Road Villas, Camden New Town.
Edwards, W., Pound Hill, Worth, Sussex.
Edwards, Rev. Z. J., Axminster, Devon.
Egles, Edward Henry, Esq., Emanuel College, Cambridge, and 30, Park Crescent, Brighton.
Egles, G. M., Esq., 30, Park Crescent, Brighton. *British Lepidoptera.*
Elliott, J., West Croft, Stanhope, *viâ* Darlington.
Enoch, William, Bath Street, Leamington.

Fairlie, Evelyn, Esq., Cheveley Park, Newmarket.
Fairlie, John, Esq., Cheveley Park, Newmarket.
Farrow, William, Woburn, Beds.
Fathers, Thomas, Witney.
Farren, William, Jun., King's Old Gateway, Cambridge. *Collects for Sale.*
Fawkes, F. H., Esq., Upton Park, near Slough, Bucks.
Fedarb, J., 113, Snargate Street, Dover.
Fenton, Mr. John, Parkwood Springs, Sheffield.
Fordham, Thomas, Esq., Snelsmore Hill East, near Newbury, Berks.
Forrest, B. G., Legh Street, Warrington. *British Lepidoptera.*
Fremlin, Mr. R. H., Wateringbury, near Maidstone.
Fryer, Charles, Esq., 83, Rumford Street, Chorlton-on-Medlock, Manchester. *British Lepidoptera and Coleoptera.*
Fuller, A., Esq., Broyle House, Chichester. *British Lepidoptera.*

GATCOMB, JOHN, Esq., Wyndham Place, Plymouth. *Collects all Orders. Keeps no Collection.*

GATES, WILLIAM, 122, Shaftesbury Street, Ashley Crescent, City Road. *Lepidoptera and Coleoptera.*

GIBBS, HERBERT F., 20, Robert Street, King's Road, Chelsea.

GILBERT, Mr. R., 17, Upper Phillimore Place, Kensington.

GOADBY, Rev. JOS. J., Market Harborough.

GORE, Rev. H. J., Rusper Rectory, Horsham.

GOWER, Mr. W. H., Ham Road, Kingston, Surrey. *British Lepidoptera and Coleoptera.*

GRAHAM, W. B., Superintendent of Police, Sharnbrook, Beds. *British Lepidoptera.*

GRAINGER, JOHN, Esq., A.B., T. C. D., Palatine Club, Liverpool. *British Lepidoptera and Coleoptera.*

GRANT, Rev. Jos. B., Oxenhope, near Keighley, Yorkshire.

GRANTHAM, HENRY, Esq., Scawby, near Brigg, Lincolnshire. *British Insects.*

GRAY, R., 3, Oriel Place, Cheltenham.

GREEN, J., Market Place, Wisbeach.

GREENIP, WILLIAM, Plosh, Keswick, Cumberland.

GREGOR, WALTER, Parochial Schoolmaster, Gowkstanes, Macduff, Banff.

GREGORY, WILLIAM, Sen., 24, Clandon Street, near South Street, Walworth.

GREGORY, WILLIAM, Jun., Ditto.

GRIERSON, T. B., Esq., Surgeon, Thornhill, Dumfriesshire.

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HYMENOPTERA.

Notes and Observations on the Aculeate Hymenoptera.

By Frederick Smith.

Another year has passed since we were called upon to register the observations and discoveries made in this country, in the order *Hymenoptera*. At the commencement of an Entomological season, it is to us an agreeable pastime, to speculate on what may possibly occur during the ensuing campaign. We have possibly obtained some little insight, have made some trifling observation, which the coming season, we fondly hope, will give us an opportunity of following up, and of thereby unravelling some hitherto impenetrable mystery; but alas! we cannot "look into the seeds of time," nor tell "which grain will grow."

The records of the past season contain some interesting discoveries of which our speculations had no foreshadowing: these, however, will doubtless appear, to some, matters of small account, and our annual register scarcely worth the trouble of perusal; but, in what estimation should we hold a register of the doings of our Entomological predecessors of the year 1806? Our best thanks should be awarded to Mr. Marsham, for *his list* of *Coleoptera*—with what a relish we should dwell upon the localities pointed out by that eminent Entomologist! Special indeed would be our obligations to the Rev. William Kirby, for having noted down

the *localities* of his unique species of *Andrenidæ*, and for the interesting observations which he made upon their economy. These reflections are somewhat consolatory, and we look forward with hope, that in the year 1906, a grateful posterity will award to us their warmest acknowledgments, and will duly estimate the energetic endeavours of Mr. Stainton in the cause of Entomology.

We have to chronicle but few notable discoveries of new species, but these are extremely interesting, and we trust the interest will be increased, by additional observations on the habits and economy of the species.

This paucity of novelty is in a great measure attributable to the fact of there being so few labourers in the fruitful field of Hymenopterous research; notwithstanding the engrossing interest which attaches to the study of the *Hymenoptera*, he who enters upon it must expect frequently to toil long and laboriously, uncheered by the encouraging presence and fellowship of brother Hymenopterists. To one who has quietly, but perseveringly, laboured year after year on this enchanting ground, it is a matter of much regret that so few have shared the pleasure which the study of the *Hymenoptera* so peculiarly affords.

The individual histories of the *Aculeata* are amongst the most instructive, entertaining and marvellous records which have appeared in the entire range of Entomological literature.

In support of the position which we have assigned to the *Hymenoptera*, it will only be necessary to examine carefully a bee or a wasp; what insect surpasses either of these in intelligence, or in the instinctive faculties which they possess? in structure, how admirable in all respects! unsurpassed in power of flight, gifted with powers of vision in a superior

degree to many other insects, and possessing a development in other respects unsurpassed by any of the tribe.

Possessed of the above qualifications, we cannot hesitate to place the *Hymenoptera* in the highest rank of the orders of insects; such being the case, it is somewhat surprising, that so few Entomologists avail themselves of the opportunity of studying the most attractive pages in the book of nature, and of tracing out themselves, histories equally marvellous as those which Reaumur and others have so graphically described.

During the past season, the minds of Entomologists have been powerfully directed to a most important subject, connected as it were with the very foundation of the science; namely, that of *specific distinctions and their variations.* The masterly work upon this subject by Mr. Wollaston has directed our attention specially to the inquiry, and it appears to us that a few parallels to some of the instances recorded by Mr. Wollaston, of the effect of climate upon particular species, may neither be out of place, nor uninteresting in the pages of an Annual.

In 1853, we recorded an opinion, that the *Halictus flavipes* was found throughout Europe, in Nova Scotia, in Ohio, and in North America. To the geographical range of this species, we appended a note, to the effect that "the specimens from America are larger than any yet observed from other localities, but that in other respects, no difference could be detected; the sculpture of the metathorax and the neuration of the wings being the same. The *Halictus parallelus* of Say is certainly the *representative* of the *H. rubicundus* of Europe, if indeed it be not the same species, slightly altered by climatal influences. The *Andrena pilipes* of this country, I consider to be identical with specimens from North Africa; and we possess specimens of *Andrena Clark-*

ella from Nova Scotia which cannot be separated from examples taken in Scotland; yet both are much less rich in the colouring of their pubescence than any individuals found in the London district. Perhaps the most widely distributed species of bee known is the *Megachile centuncularis;* in the British Museum are specimens from all parts of Europe, including Finland and Lapland; others from North America, Hudson's Bay and Canada: not the slightest difference can be detected in examples from the above widely distant localities. *Osmia hirta,* of the European Continent, is found in the Island of Madeira and also in the Canary Islands; *Osmia ænea* of this country is also found in the Canary Islands. *Nomada ruficornis* occurs in this country and in North America. The only species of *Bombus* from North America, which appears to be identical with the European one, is the *Bombus hortorum;* this insect was captured by Sir John Richardson, at Lake Winnepeg, on his last Arctic expedition. The *Vespa vulgaris* of Europe cannot be specifically distinguished from what has been considered to be its American representative. The *Pompilus Americanus* we have regarded as the American form of the European *P. fuscus*—not to multiply examples, we will only mention the well known insect *Chrysis ignita,* the common ruby-tailed fly, which is found in no way differing from British examples, at the Cape of Good Hope. That difference of locality is an index to difference of species, need scarcely be denied; but nothing can possibly be more insecure than building upon such an hypothesis: the knowledge which we have acquired of some species of *Hymenoptera* in this country proves that nothing but an intimate acquaintance, with variable insects, can enable the naturalist to distinguish between the variety and the species.

In support of the above opinion, it is only necessary here to quote a single instance; namely, the *Bombus subter-*

raneus, which in its most highly coloured form is a black insect, with bright yellow bands on the thorax and abdomen, having the apex of the latter white; from this form, every gradual change is to be met with, until we arrive at the last, which presents an insect totally black: no one, possessing the extremes of the range of varieties only, and only one or two of the intermediate stages, could possibly satisfy himself that these constituted but one species; supply the intermediate links, and the difficulty ceases at once. Such being the case in one instance, we may reasonably conclude that it is a circumstance of frequent occurrence; such in fact it is well known to be amongst British insects.

The above observations tend principally to establish the fact, that great range must be allowed to differences in coloration, whilst endeavouring to settle its limits, when describing a species. We will now advance a well-known insect, as an instance of differences to be met with in a single species, in sculpture and form. No better illustration of this can probably be produced than *Chrysis ignita*. This insect is entirely covered with punctures; but the differences in the coarseness or fineness of the punctation is immense. The apex of the abdomen is armed with four teeth; but the relative length as well as position of these is known to assume nine distinct types of form; in the last, the two central teeth are nearly obsolete; in a tenth type, which we possess, all the teeth are obsolete. The above instances should, we think, induce the young naturalist to resist the spreading rage for the multiplication of species, and to avail himself of every information which either collections or books afford, before he venture to create a species, probably out of a variety, or to do that which another has accomplished before him. The attention which is now being given to this subject will doubtless create a re-action, and we may even

observe a tendency on the part of some to allow little less than the contents of most of our modern genera to rank as a *species;* the order itself, consequently, falling into what we now consider to constitute a *genus.*

It was our province last year to record an unusual scarcity of the aculeate tribe; the season of 1856 produced them in tolerable abundance generally; but it is a remarkable fact, that the *Vespidæ*, which were scarce in 1855, have been still more so in 1856. Indeed persons, not Entomologists, in certain districts have remarked their scarcity. We have observed, that, in seasons when fruit is abundant, wasps are abundant also. This is what might indeed be expected. The same warm genial weather which causes your fruit trees to blossom, rouses the wasps from their winter's torpidity. When this is followed by severe, cold and wet weather, with sharp frosty nights, the blossoms are nipt and the fruit crop destroyed. The same causes prove destructive to the *Vespidæ*. In limited districts I have been told that wasps have been plentiful, but, generally, I have ascertained, they have been unusually scarce.

Bees, on the contrary, have been abundant; and in the Isle of Wight, which I believe "to surpass all other localities in this country for its richness in Hymenopterous treasures," their abundance was such, that in one spot at Freshwater, Mr. Bond informed me, that he had no doubt he could have captured upwards of a hundred specimens of a species of *Halictus*, by one swoop of his net. In the month of April, we observed a greater number of *Andrena Clarkella* on Hampstead Heath than we ever remember to have observed on any previous occasion; it would appear indeed to have been unusually abundant in many other situations, as several correspondents forwarded the species to us from different parts of the country.

I have this year obtained *Monodontomerus nitida* from the cells of *Osmia bicornis;* upon the larva of the latter insect it is parasitic; as many as eight or ten of the Chalcididous parasite are nourished by a single larva of the bee. Another and more interesting insect, of the same family, was bred from the cells of the bee, namely, *Melittobia Acasta.* After the most careful comparison and examination of this insect, I believe it to be identical with the *Anthophorabia retusa* of Newport. I had not the opportunity of observing the parasites in their early stages of larva and pupa, as they were enclosed in the cocoons spun by the larvæ of the bee, so that I am unable to state confidently, whether both these parasites feed upon the bee larvæ or not. When I first met with the larvæ of *Melittobia* in 1843, in the cells of *Anthophora,* they were feeding upon the larvæ of *Monodontomerus.* This was easily observed, as the species of *Anthophora* do not spin cocoons, but undergo their changes in the clay cells constructed by bees.

I captured about a dozen specimens of *Exetastes femorator,* a species first described by Mr. Desvignes in his Catalogue of British *Ichneumonidæ,* recently published by the Trustees of the British Museum. This insect has not been met with in any other locality than the Deal Sands, where I found it. Its mode of running and flying so closely resembles a *Pompilus,* that at first sight I mistook it for one.

Sphinctus serotinus, only a few specimens of which have occurred in this country, was captured by Mr. Thomas Ingall on the 13th of September last; it was beaten out of an oak in the Wickham Woods; it appeared very sluggish and made no attempt to escape. Although diligent search was made a second example could not be found. We are indebted

to Mr. Ingall for kindly communicating the above information. Mr. Desvignes, we understand, has captured several rare species of *Ichneumonidæ*, but we have not been favoured with their names.

A winged female of *Ponera contracta* was captured by Mr. Baly of Kentish Town, whilst reading by an open window in his house; the *Ponera* flew into the room and settled on the page of his book. This insect is extremely rare in this country; so much so, that, although I have searched diligently for insects of the family to which it belongs for many years, I never met with a single individual. Mr. Westwood has also captured a female of *Ponera*, attracted to pieces of meat laid in his garden as baits for insects.

Fossores.

Tachytes unicolor was captured in July on the sands near Deal; the only other localities for it known, are Luccombe Chine, Isle of Wight; Weybridge; and Sandhurst, near the Military College.

Miscophus spurius? Dahlb. This is one of the most interesting discoveries which I have had the good fortune to make. The genus *Miscophus* hitherto contained only a single British species, and has always been accounted one of extreme rarity; Mr. Westwood first discovered it in this country at Coomb Wood, and subsequently both sexes were taken by myself at Weybridge. In July last I met with the second species at Deal on the sand-hills. Like its congener it is only to be found on the hottest summer days; when cloudy or windy they disappear. *Miscophus spurius* differs from *M. bicolor* in both sexes being entirely black; the metathorax is proportionably longer and has a central longitudinal carina; it is also a larger species. Dahlbom says, that

M. spurius is rather smaller, which alone induces me to add a note of doubt to my insect; but as it possesses, in common with *M. spurius*, a central longitudinal carina on the dorsal surface of the metathorax, I am unwilling to consider a little difference in size as of much specific value.

Astata stigma. The female occurred at Deal in the month of July; last year I captured one in September; the male has not yet been taken in this country. I had the pleasure of adding the species to our fauna in 1836, by capturing a single female; it was not again met with until last year, when I took a second example, and my capture of 1856 makes the third: these are all which have occurred in this country to my knowledge.

Oxybelus mucronatus. This insect was described by Mr. Curtis as a new species, which he named *O. argentatus;* it has been frequently taken at Bideford, Devon, and I believe it has occurred near Liverpool; this season I took it on the Deal sand-hills.

The scarce *Mellinus sabulosus* has been taken at Nottingham by Mr. C. F. Allen of that place.

Apidæ.

Colletes marginata. This hitherto extremely rare species occurs in July at Deal; it was first taken in this country by Dr. Leach, and Mr. Samuel Stevens next took it at Little Hampton, Sussex; at Deal it is not uncommon, but confined to one particular locality; I did not observe a single example in any other situation.

Andrena decorata. The rare species has been taken by Mr. Parfitt in the neighbourhood of Exeter.

Cilissa tricincta. This very local species I found not uncommon at and in the neighbourhood of Deal: nearly all

which I captured were males; the female I have very rarely taken.

Megachile maritima is an abundant insect on the sand-hills at Deal during July; there it burrows in the ground, which proves it to be an insect of varied habit. I have observed it burrowing in decayed wood in Hampshire; but in the Isle of Wight it burrows in the cliffs of Sandown Bay in multitudes; at Deal, as in Sandown Bay, it is accompanied by its parasite *Cœlioxys Vectis*.

Megachile argentata. This is the *M. Leachella* of Stephens and of all our cabinets a few years ago, an insect then considered a great rarity; in 1844 I met with one or two at Weybridge, and four years ago I again took two or three at Southend. The metropolis of this species is on the sand-hills at Deal; in the month of July they are to be found settling on every hillock, the place is literally alive with them, their cheerful piping sound is heard everywhere; the male is usually found chasing the female from flower to flower; sometimes they are pursued by two or more males at once whilst settling on the trefoil. This insect burrows in the ground, and lines its tunnel with the leaves and petals of *Lotus corniculatus;* the latter appear to be most frequently selected for the inner lining of the cells, and are also used together with cuttings of leaves in forming the divisions between the cells. The industrious little creature having lined its burrow as described, deposits a sufficient quantity of semi-fluid pollen and honey for a single larva, and then closes in that portion of the tube with circular pieces of leaf, thus forming the first cell; the process is repeated until five or six cells are furnished, when her task is completed. There can be little doubt of the same bee constructing several burrows of this kind.

Cœlioxys 4-*dentata*. This bee is the parasite of *M. argentata;* but is not so numerous, as I should have expected to have found it. By very assiduous search, I captured about twenty specimens. It is worthy of remark that in the Isle of Wight, where I found *Megachile maritima* abundant, its parasite *Cœlioxys Vectis* was very numerous, as were also *Saropoda bimaculata*, and its parasite *Cœlioxys umbrina;* but at Deal, although *Megachile maritima* and *argentata* were both abundant, their parasites *Cœlioxys Vectis* and 4-*dentata* were scarce.

Dasypoda hirtipes. We notice the capture of this beautiful insect, by Mr. Dossetor at Redhill near Reigate, and by myself at Deal, principally for the purpose of recording a new phase in bee history. Entomologists are well acquainted with the fact of immense numbers of Lepidopterous and also Coleopterous insects flying by night; and thirteen years ago I recorded the fact of *Vespa crabro* carrying on its labours by moonlight. Until the present season I was not aware that any species of *Apidæ* took flight after dark; but one moonlight night, walking in the streets of Deal, I captured males of *Dasypoda hirtipes* on the wing; several large insects had flown about our faces, but were supposed to be moths, until one got entangled in my wife's head-dress, and on releasing it, it proved to be *Dasypoda*. I should observe, that the situation of the colonies of this bee are upwards of a mile from the spot where we captured them at night.

Stelis aterrima and *phæoptera* have both occurred this season; the first at Deal, and the latter near Exeter, where it was captured by Mr. W. H. Parfitt, who observed it about the burrows of *Osmia ænea*.

Nomada borealis. Both sexes of this species were captured by Mr. Dossetor and myself on Hampstead

Heath at the end of April. Mr. Bold also found it plentifully near Newcastle.

Apathus rupestris. I captured about twenty specimens of the female of this bee on the heads of thistles, at Sandwich in Kent. Twenty years ago I met with a similar number in a gravel-pit at the top of Coomb Wood; these are unusual occurrences, the insect being rather scarce, at least the female, and only captured at intervals.

It may appear to some that in the above summary we have done little more than chronicle our own doings. To this we answer, the fault lies not at our door; we shall be ready to hail joyfully any number of companions in the selfsame fruitful field, which only needs to be toiled in with industry, and every one may ensure to himself a most abundant harvest of never-failing enjoyment.

NEUROPTERA.

A Synopsis of the British Dragon-Flies.

By Dr. Hagen.

The object of this paper is to enable the inexperienced collector of Dragon-flies to name readily any species he may meet with in this country; the special characters which distinguish the species and genera are therefore put prominently forward; and in the characters of the genera and groups, those are made use of which apply to all the British species, even though, in *other parts of the globe*, species may occur to which the characters here laid down will not rigorously apply.

The British Dragon-flies are 46 in number; besides enumerating these, the characters of several other species *not unlikely to occur* in Britain are given, in order to facilitate the naming of *new* British species by those who are so fortunate as to meet with them. These probable British species have no numeral prefixed to their names, which are printed in *Italics*, not in Capitals.

FIRST TRIBE. WINGS NOT SIMILAR; THE POSTERIOR DILATED AT THE BASE.

FIRST DIVISION. LOWER LIP SMALLER THAN THE PALPI.

FIRST SUB-FAMILY. EYES SIMPLE, NOT PROLONGED POSTERIORLY: LIBELLULINA.

Genus LIBELLULA, Linné.

A. WITH 10—16 ANTECUBITAL NERVURES; LARGE SPECIES; ABDOMEN BROAD AND DEPRESSED.

†. 4 ROWS OF POST-TRIGONAL CELLS.

1. L. QUADRIMACULATA, L.; Steph.; Revue, p. 7. Ev. pl. 17, fig. 1, 2.

Length 19 lin.; exp. 32 lin.

Habitat England, Scotland, Ireland generally.

Olivaceous, villous; sides of the thorax yellowish, streaked with black; abdomen rather conical, black towards the tip; wings yellowish at the base; the pterostigma, *a spot in the middle of the costal margin* of the anterior, and a triangular spot at the base of the posterior, black.

Var. Tip of the wings brown. *L. prænubila* Newman.

††. THREE ROWS OF POST-TRIGONAL CELLS.

a. A BLACKISH TRIANGULAR SPOT AT THE BASE OF THE POSTERIOR WINGS.

2. L. DEPRESSA, L.; Steph.; Revue, p. 8. Ev. pl. 16, figs. 1, 2.

Length 19 lin.; exp. 32 lin.

Habitat England, Scotland, Ireland; generally.

Olivaceous, villous; *abdomen very broad and much*

depressed, with yellow spots on the sides; powdered with blue in the adult ♂; anterior wings with a longitudinal rusty blackish band at the base; posterior wings with a triangular spot of the same colour; *accessory membrane white.*

3. L. FULVA, Müller; Revue, p. 9. *L. conspurcata*, F.; Steph. Ev. pl. 16, fig. 3.
Length 19 lin.; exp. 32 lin.
Habitat England; local.
Dusky reddish, villous; abdomen with an apical black-band; powdered with blue in the adult ♂; anterior wings with a rusty black line at the base: posterior wings with a line and triangular spot of the same colour; *accessory membrane blackish.*
Var. The tips of the wings brown.

b. POSTERIOR WINGS WITHOUT A BLACKISH SPOT AT THE BASE.

4. L. CANCELLATA, L.; Revue, p. 12; Steph. Evans, pl. 17, fig. 3, and pl. 18, fig. 1.
Length 19 lin.; exp. 32 lin.
Habitat England; local.
Yellowish; *abdomen with two black bands;* powdered with blue in the adult ♂; wings hyaline; pterostigma and *accessory membrane blackish.*

L. albistyla, Selys; Revue, p. 13; closely resembles the preceding, differing chiefly by the *whitish anal appendages;* (these are black in *L. cancellata*). It occurs at Lyons.

5. L. CÆRULESCENS, F.; Revue, p. 22; Steph. Ev. pl. 18, fig. 2, 3.

Length 16 lin.; exp. 26 lin.

Habitat England, Scotland, Ireland; local.

Olivaceous; abdomen little depressed, rather carinated; powdered with blue in the adult ♂; wings hyaline; pterostigma yellow; *accessory membrane whitish.*

L. brunnea, Fonscol.; Revue, p. 18.

Length 19 lin.; exp. 32 lin.

Very similar to the last, a little larger; the adult ♂ entirely powdered with blue, *the genital organs little protruded;* (tolerably prominent in *L. cærulescens*); ♀ with the vulvar scale broadly emarginate, the corners rounded; (in *L. cærulescens* abruptly emarginate, with the corners swollen).

Common in Belgium.

L. erythræa, Brullé; Revue, p. 24.

Length 17 lin.; exp. 27 lin.

Olivaceous; the adult ♂ *bright red;* wings hyaline, slightly tinged with saffron at the base; pterostigma yellow; *accessory membrane blackish.*

Near Paris, and in Anjou.

B. WITH 6—8 ANTECUBITAL NERVURES; SMALL SPECIES; ABDOMEN SLENDER, NEARLY CYLINDRICAL.

L. pedemontana, F.; Revue, p. 28.

Length 14 lin.; exp. 22 lin.

Small; reddish or olivaceous; wings hyaline, *with a broad brown* transverse band towards the tip; pterostigma yellowish.

In Belgium.

a. POSTERIOR WINGS WITHOUT A TRIANGULAR BLACKISH SPOT AT THE BASE.

†. LEGS BLACK, EXTERNALLY YELLOW; ABDOMEN REDDISH-OLIVE IN THE ADULT ♂.

6. L. FLAVEOLA, L.; Revue, p. 33; Steph. Charp. pl. 9.
Length 16 lin.; exp. 26 lin.
Habitat England, Scotland; local.
Yellowish, the base of the wings (*the posterior pair to a third or more*) *tinged with saffron;* pterostigma short, yellow; anal appendages of the ♂ straight; *nervures of the wings blackish.*

7. L. FONSCOLOMBIS, Selys; Revue, p. 37.
Length 17 lin.; exp. 28 lin.
Habitat near London (a single ♀ in the collection of the British Museum, formerly in that of Mr. Stephens).
Yellowish or reddish; base of the wings tinged with saffron; *pterostigma large, yellow;* posterior tibiæ of the ♂ black externally; *upper anal appendages* of the ♂ *slightly geniculated; most of the nervures reddish.*

8. L. MERIDIONALIS, Selys; Revue, p. 39.
Length 16 lin.; exp. 26 lin.
Habitat near London; two ♀ in the collections of Evans and Wailes.
Yellowish, *sides of the thorax immaculate;* wings hyaline, almost uncoloured at the base; pterostigma narrow, yellow; *vulvar scale* of the ♀ *not projecting,* rounded.

9. L. STRIOLATA, Charp.; Revue, p. 40. *L. vulgata,* Steph.; Ev. Charp. pl. 10.
Length 17 lin.; exp. 28 lin.
Habitat England, Scotland, Ireland.
Olivaceous, sides of the thorax with three oblique black streaks; the incisures of the abdominal segments, and

two very small dots towards the hinder edge, yellow; wings hyaline, almost uncoloured at the base; pterostigma reddish; *vulvar scale* of the ♀ *projecting*, broad, *emarginate at the end.*

10. L. VULGATA, L.; Revue, p. 45. Charp. pl. 11.
Length 17 lin.; exp. 28 lin.
Habitat. A ♀ taken near Hull; on the authority of Mr. Dale.
Olivaceous, sides of the thorax with three oblique black streaks; abdomen without yellow dots; wings hyaline, almost uncoloured at the base; pterostigma reddish; *vulvar scale* of the ♀ *very prominent, not emarginate at the end; straightened.*

†† LEGS BLACK.

11. L. SANGUINEA, Müller; Revue, p. 31. *L. Roeselii*, Curt. *L. rufostigma, basalis, angustipennis*, Steph. Charp. pl. 10, *L. nigripes.*
Length 16 lin.; exp. 26 lin.
Habitat England, local.
Olivaceous or reddish; underside of the thorax behind the legs of the ground colour; *abdomen with a lateral black band;* base of the wings tinged with saffron; pterostigma reddish; in the adult ♂ the abdomen is reddish.

12. L. SCOTICA, Donov.; Revue, p. 48; Steph.; Curtis. Charp. pl. 12.
Length 14 lin.; exp. 23 lin.
Habitat England, Scotland, Ireland.
Olivaceous or blackish; underside of the thorax behind the legs with *three yellow spots forming a fleur-de-lys;* abdomen short, black, spotted with yellow; wings of the ♂ hyaline; in the ♀ a little tinged with

saffron at the base; pterostigma square, and black. The adult ♂ almost entirely black.

b. Posterior wings with a blackish triangular spot at the base.

Front white, lower lip black, upper lip of the male white, of the female black; abdomen short, with angular spots above; pterostigma square.

†. Anal appendages black.

13. L. dubia, Vander Lind.; Revue, p. 50. *L. rubicunda*, Curt. pl. 712.

Length 15 lin.; exp. 26 lin.

Habitat England, rare; near Dorchester.

Black, spotted with orange, villous; *abdomen slender*, spotted above as far as the seventh segment; wings hyaline, a dot and a basal spot (larger on the posterior wings) blackish; *pterostigma reddish; vulvar* scale with two little *valves*, which are *quadrangular and contiguous.*

L. rubicunda, L.; Revue, p. 53. Charp. pl. 13, *L. pectoralis*, var.

Length 18 lin.; exp. 28 lin.

Black, spotted with red or orange, villous; *abdomen slender*, spotted above as far as the seventh segment; wings hyaline, a spot on the anterior, a dot and a spot on the posterior blackish; the *pterostigma reddish*, ♂; or *black*, ♀; *vulvar* scale with two very small triangular *valves*, *very remote from one another.*

In Belgium.

L. pectoralis, Charp. pl. 13; Revue, p. 56.

Length 18 lin.; exp. 28 lin.

Black, spotted with red, or orange, villous; *abdomen*

thick, spotted above as far as the seventh segment; wings hyaline, the base a little yellowish, the posterior with a triangular black spot; *pterostigma black; vulvar* scale prolonged into two long triangular *ligulæ*, which are *contiguous* except at the end.

In Belgium.

†† UPPER ANAL APPENDAGES WHITISH.

L. albifrons, Burm.; Revue, p. 59.

Length 16 lin.; exp. 26 lin.

Black, spotted with orange, villous; abdomen *slender, cylindrical*, spotted above as far as the sixth segment; powdery blue in the adult male; wings hyaline, posterior with a triangular black spot; *pterostigma black; vulvar scale* with two *broad, contiguous lamellæ, very short.*

In Sweden, Prussia and Austria.

L. caudalis, Charp. pl. 44; Revue, p. 62.

Length 16 lin.; exp. 28 lin.

Black, spotted with orange, villous; *abdomen much dilated at the tip*, depressed, spotted above as far as the sixth segment; wings hyaline, the base tinged with saffron, the posterior with a triangular black spot; *pterostigma black; white above in the male*, of which the abdomen is powdery blue; *vulvar* scale prolonged into two long *ligulæ, contiguous* except at the end.

In Belgium; and in France, near Paris.

SECOND SUB-FAMILY. THE EYES WITH A SLIGHT PROLONGATION BACKWARDS. CORDULINA.

A. A TRIANGULAR BLACKISH SPOT AT THE BASE OF THE POSTERIOR WINGS.

Genus EPITHECA, Charp.

E. bimaculata, Charp. pl. 1; Revue, p. 66.

Length 26 lin.; exp. 38 lin.

Large; testaceous, villous; *abdomen long, depressed in the middle*, with a dorsal black band; wings yellowish, tinged with saffron on the costal margin; *accessory membrane very large, whitish.*

In Belgium.

B. POSTERIOR WINGS WITHOUT A BLACKISH SPOT AT THE BASE.

Genus CORDULIA, Leach.

a. TRIANGLE OF THE ANTERIOR WINGS INÆQUILATERAL, INCLOSING A TRANSVERSE NERVURE.

†. FACE SPOTTED WITH YELLOW, LOWER ANAL APPENDAGES OF THE MALE TRIANGULAR.

14? C. METALLICA, Vander Lind.; Steph.; Revue, p. 62. Charp. pl. 15.

Length 23 lin.; exp. 32 lin.

Habitat. No specimen is known with certainty to have been caught in England. Harris's figure is very doubtful.

Bronzed-green; *a transverse yellow band on the front;* anal appendages of the male bent inwards at an angle near the end, smooth beneath; *vulvar scale very long, subulate, straightened.*

C. alpestris, Selys; Revue, p. 71.
Length 20 lin.; exp. 28 lin.
Very similar to the preceding, but a little smaller; a yellow spot before each eye, instead of the band; *the vulvar scale short, rounded.*
In Sweden and Switzerland.

15. C. ARCTICA, Zetterstedt; Revue, p. 71.
Length 21 lin.; exp. 30 lin.
Habitat Perthshire, in July.
Bronzed-green; a yellow spot before each eye; *anal appendages* of the male closely approximated, with three teeth beneath, *semicircular at the extremity;* vulvar scale short, triangular, pointed at the end.

C. flavo-maculata, Vander Lind.; Revue, p. 73. Charp. pl. 16.
Length 23 lin.; exp. 32 lin.
Similar to the preceding, but a little larger; abdomen stouter, spotted with yellow at the sides; *anal appendages* of the male with the ends *approximating; vulvar scale bifid at the tip.*
In Belgium.

††. FACE NOT SPOTTED WITH YELLOW, LOWER ANAL APPENDAGES OF THE MALE FORKED.

16. C. ÆNEA, L.; Donov.; Steph.; Revue, p. 75. Charp. pl. 14.
Length 20 lin.; exp. 30 lin.
Habitat England, local; Ireland (?)
Bronzed-green, upper anal appendages of the male subcylindrical, the point turned outwards; vulvar scale strongly bifid.

b. TRIANGLE OF THE ANTERIOR WINGS EQUILATERAL, WITHOUT AN INCLUDED NERVURE.

17. C. Curtisii, Dale; Steph.; Curtis, pl. 616; Revue, p. 77.
Length 20 lin.; exp. 30 lin.
Habitat England, local; (New Forest).
Bronzed-green, face of the ground colour; *abdomen* cylindrical (♂) or compressed (♀), *with dorsal yellow spots;* anal appendages of the male sub-cylindric, with an internal spine at the base, the lower a little emarginate at the end; vulvar scale short and rounded.

Second division. Lower lip larger than the palpi.

Third sub-family. Eyes not contiguous, or scarcely so. GOMPHINA.

A. Eyes remote, lower lip rounded at the tip.

Genus Gomphus, Leach.

18. G. vulgatissimus, L.; Revue, p. 82; Steph.; Curtis. Evans, pl. 14, f. 1.
Length 22 lin.; exp. 28 lin.
Habitat England; local. Ireland.
Thorax yellow, with six straight broad black stripes; *abdomen* black, *with a* dorsal *yellow stripe, not extending beyond the seventh segment;* costal nervure black outwardly; legs black; anal appendages of the male cylindrical, suddenly pointed, the lower with the branches wide apart; vulvar scale cleft in the apical half.

19. G. flavipes, Charp.; Steph., pl. 30; Revue, p. 84.
Length 24 lin.; exp. 33 lin.
Habitat England (Hastings in August). A single

male in the collection of the British Museum, formerly in that of Mr. Stephens.

Thorax yellow, with six curved stripes; abdomen black, with a dorsal yellow stripe continued to the end; costal nervure black outwardly; *legs yellow, streaked with black;* anal appendages of the male cylindrical, pointed, the lower with widely separated branches; vulvar scale short, divided to the base.

G. pulchellus, Selys; Revue, p. 91; Charp. pl. 30 (*anguina*).

Length 22 lin.; exp. 27 lin.

Thorax yellow, with six narrow straight black streaks; abdomen black, with a dorsal yellow stripe continued to the end; *costal nervure yellow outwardly;* legs yellow, streaked with black; anal appendages of the male cylindrical, truncate externally at the end, the lower with the branches widely separated, vulvar scale broadly emarginate in its apical half.

In Belgium.

20. G. FORCIPATUS, Revue, p. 98; Charp. pl. 27.

Length 23 lin.; exp. 28 lin.

Habitat England. One female in the collection of the British Museum, formerly in that of Mr. Stephens.

Thorax yellow, with six curved black streaks; abdomen black, with lanceolate dorsal yellow spots; legs black, yellow at the base; *anal appendages* of the male *hooked, the point bifid*, the lower with the branches contiguous; vulvar scale prolonged in two approximating lamellæ.

B. EYES SLIGHTLY CONTIGUOUS, LOWER LIP CLEFT AT THE END.

Genus CORDULEGASTER, Leach.

21. C. ANNULATUS, Latr.; Steph.; Evans, pl. 13; Revue, p. 104.
Length 32 lin.; exp. 42 lin.
Habitat England, Scotland, Ireland.
Large, black; thorax with eight yellow stripes; abdomen with the median segments yellow; *back of the head yellow;* costal nervure yellow outwardly; upper lip yellow.

C. bidentatus, Selys; Revue, p. 107.
Length 30 lin.; exp. 40 lin.
Very similar; *back of the head and costal nervure black;* upper lip yellow, edged with black.
In Belgium.

FOURTH SUB-FAMILY. EYES COMPLETELY CONTIGUOUS.

ÆSCHNINA.

A. ANAL ANGLE OF THE POSTERIOR WINGS ACUTE (♂) OR ROUNDED (♀).

Genus ÆSCHNIA, Fabr.

22. Æ. PRATENSIS, Müller (*vernalis* auctorum); Revue, p. 113. Charp. pl. 21.
Length 26 lin.; exp. 34 lin.
Habitat England, Scotland, Ireland.
Brown, *very hairy;* thorax with two yellow bands in front; abdomen almost cylindrical, attenuated towards the end, spotted with blue (♂) or yellow (♀); anal appendages of male long, triangular, with the end obtuse, the lower very short, truncate, emarginate, triangular; *pterostigma long, very narrow;* accessory membrane small; anal angle of the posterior wings but slightly angular in the male.

23. Æ. MIXTA, Latr.; Revue, p. 122. Charp. pl. 19.
Length 28 lin.; exp. 36 lin.
Habitat England, Scotland; local.
Brown; *thorax with* two dots in front and *two bands on the sides, yellowish;* abdomen slender, cylindrical, coarctate behind the base in the male, spotted with blue (♂) or yellowish (♀); accessory membrane cinereous, lighter at the base; anal appendages of the male long, leaf-like, their end pointed, without a basal tubercle beneath; the lower long and triangular.

Æ. affinis, Vander Lind. (non Stephens); Revue, p. 124. Charp. pl. 18.
Length 28 lin.; exp. 36 lin.
Brown; *thorax* with two yellow dots in front, *the sides yellowish, with three black lines,* the middle one the shortest; abdomen slender, cylindrical, coarctate behind the base in the male, spotted with blue (♂) or yellowish (♀); accessory membrane cinereous, paler at the base; anal appendages of the male long, leaf-like, their end pointed, *a very distinct basal tubercle beneath;* the lower long, slender, triangular.
In Belgium.

24. Æ. BOREALIS, Zetterstedt; Revue, p. 119.
Length 26 lin.; exp. 34 lin.
Habitat Scotland. A single male in the cabinet of M. De Selys.
Brown; *thorax with* two small blueish lines in front, and *two narrow blueish bands at the sides;* abdomen slender, cylindrical, coarctate behind the base in the male, spotted with blue (♂) or yellowish (♀), accessory *membrane of a uniform cinereous;* anal appendages of the male long, leaf-like, their end pointed, an

inconspicuous basal tubercle beneath; the lower broad, triangular. *Æ. borealis* is easily recognized because it is the only one of which the *subnodal sector is simple*, and not bifurcate at the end; the subnodal sector is the fifth longitudinal nervure from the costa, counting that as one, in the end of the wing.

25. Æ. JUNCEA, L.; Steph.; Revue, p. 116. Charp. pl. 20. (*Æ. picta.*)

Length 32 lin.; exp. 46 lin.

Habitat England, Scotland, Ireland.

Brown; thorax *with two straight yellowish stripes in front*, interrupted in the female, and *two oblique yellowish bands at the sides;* abdomen slender, cylindrical, coarctate behind the base in the male, spotted with blue (♂) or yellowish-white (♀); accessory membrane cinereous, paler at the base; pterostigma very large; anal appendages of the male long, leaf-like, their end pointed, without a basal tubercle; the lower triangular, long.

26. Æ. CYANEA, Müller; (*maculatissima* auctorum); Revue, p. 115. Charp., pl. 23.

Length 32 lin.; exp. 46 lin.

Habitat England, Scotland, generally.

Brown; *thorax with two large oval green* spots in front, and two black lines on the sides; abdomen slender, cylindrical, coarctate behind the base in the male, spotted with blue (♂) or yellow (♀); accessory membrane short, whitish; pterostigma short, almost square; anal appendages of the male long, leaf-like, the end turned inwards; the lower short, obtuse, triangular.

27. Æ. GRANDIS, L.; Revue, p. 131. Charp., pl. 24.
Length 32 lin.; exp. 44 lin.
Habitat England, Scotland, Ireland, generally.
Reddish; thorax with two yellow bands at the sides, immaculate in front; abdomen cylindrical, coarctate behind the base in the male, slightly spotted with blue; *wings* of a *reddish yellow;* pterostigma more rufescent; anal appendages of the male long, leaf-like, their end obtuse; accessory *membrane* yellowish *white.*

28. Æ. RUFESCENS, Vander Lind.; Steph.; Revue, p. 129. Charp. pl. 25.
Length 30 lin.; exp. 40 lin.
Habitat England, local in the South.
Reddish, thorax with two yellow bands at the sides, immaculate in front; *abdomen* cylindrical, coarctate behind the base in the male; *a* triangular *basal yellow spot* above, *the rest* of the ground colour, *unspotted;* wings hyaline, the base a little reddish; pterostigma fulvous; accessory *membrane* large, *brown;* anal appendages of the male long, leaf-like, the end obtuse; a basal tubercle beneath.

B. ANAL ANGLE OF THE POSTERIOR WINGS ROUNDED IN BOTH SEXES.

Genus ANAX, Leach.

29. A. FORMOSUS, Vander Lind.; Steph.; Revue, p. 110. Charp. pl. 18.
Length 34 lin.; exp. 46 lin.
Habitat England, local in the South.
Large; *thorax green;* abdomen broad, depressed, blue with a dorsal black band; front with a black spot encircled with blue; wings broad, pterostigma small;

anal appendages of the male rather spatulate, the point truncate; the lower oblong-quadrate.

A. Parthenope, Selys; Revue, p. 111.
Length 30 lin.; exp. 42 lin.
Similar to the preceding, the *thorax reddish olive;* the anal appendages of the male externally with a spinous point; the lower square, short, broader than long.
In France, near Paris.

SECOND TRIBE. FORE AND HIND WINGS SIMILAR.

FIRST DIVISION. ANTECUBITAL NERVURES NUMEROUS.

FIFTH SUB-FAMILY. LARGE SPECIES.

CALOPTERYGINA.

Genus CALOPTERYX, Leach.

30. C. VIRGO, L.; Steph.; Revue, p. 134. Charp. pl. 31. *C. xanthostoma, anceps,* Steph. *C. hæmorrhoidalis,* Evans.
Length 17 lin.; exp. 21 lin.
Habitat England, Scotland, Ireland.
Metallic blue; *wings* broad, deep *blue, the base coloured; network very fine* (♂); green or metallic brown; *wings brown; pterostigma* white, *rather distant from the apex.*

31. C. SPLENDENS, Harris; Revue, p. 139. *C. Parthenias,* Charp. pl. 33.
Length 17 lin.; exp. 21 lin.
Habitat England, Scotland, Ireland.
Metallic blue; *wings* narrower, deep *blue, the base and tip hyaline, network more open,* ♂; metallic green; *wings hyaline; pterostigma* white, *apical.*

SECOND DIVISION. TWO ANTECUBITAL NERVURES.

SIXTH SUB-FAMILY. SMALL SPECIES. AGRIONINA.

A. TIBIÆ DILATED.

Genus PLATYCNEMIS, Charp.

32. P. PENNIPES, Pallas; (*platypoda*, Steph.; auctorum); Revue, p. 168. Charp. pl. 43.

Length 12 lin.; exp. 16 lin.

Habitat England, Scotland.

White or blue (♂) and green (♀); streaked with dull bronzed green: a band on the top of the head between the eyes, two anterior bands, and two lateral lines; abdomen with double black dorsal line, or two black dots at the hinder edge of each segment; *the four posterior tibiæ dilated*, whitish; pterostigma fulvous.

B. TIBIÆ CYLINDRICAL.

a. PTEROSTIGMA LARGE, OBLONG.

Genus LESTES, Leach.

†. BACK OF THE HEAD BRONZED.

33. L. VIRIDIS, Vander Lind. (*not of English authors*); Revue, p. 148. Charp. pl. 35.

Length 15 lin.; exp. 18 lin.

Habitat England? (One in the collection of Mr. Evans).

Bronzed green, *long and slender;* thorax with three fine yellow lines in front; *pterostigma large*, light reddish; upper anal appendages like pincers, with a basal tooth, and a tubercle inside before the end; *the lower ones very short, conical, almost contiguous.*

34. L. NYMPHA, Selys, Revue, p. 151.
Length 12 lin.; exp. 14 lin.
Habitat England, Ireland.
Metallic green, powdered with blue (♂); stout, of variable size; pterostigma smaller, black; upper anal appendages like pincers, with two pointed teeth, internally rather far apart; *the lower ones long, dilated at the end.*

35. L. SPONSA, Hansem; Revue, p. 154. Charp. pl. 34.
Length 12 lin.; exp. 14 lin.
Metallic green, powdered with blue (♂), slender; pterostigma smaller, black; upper anal appendages like pincers, with two pointed teeth, internally approximated; *the lower ones long, not dilated at the end.*

†† BACK OF THE HEAD YELLOW.

36. L. VIRENS, Charp.; Revue, pl. 156. Charp. pl. 34.
Length 12 lin.; exp. 14 lin.
Habitat England; New Forest (two specimens in the collection of the British Museum, formerly in that of Mr. Stephens).
Metallic green, slender; *thorax beneath with three black spots on each side;* pterostigma reddish; upper anal appendages like pincers, with a little basal tooth, and a little median dilatation internally; the lower ones very short, converging at the end, which is rounded and very villous.

37. L. BARBARA, Fabr.; Revue, p. 159. Charp. pl. 35.
Length 12 lin.; exp. 17 lin.
Habitat Ireland? (one specimen in the Dublin Museum).
Metallic green, stout; thorax unspotted beneath; *pterostigma brown, external half yellow;* upper anal

appendages with a basal tooth, and a little median dilatation internally; the lower ones a third shorter, conical, the end slender, villous.

L. fusca, Vander Lind.; Revue, p. 161. Charp. pl. 36.
Length 12 lin.; exp. 14 lin.
Brown, spotted with yellow; wings narrow, pointed.
In Belgium.

b. PTEROSTIGMA SMALL, RHOMBOIDAL.

Genus AGRION, Fabr.

†. HEAD WITHOUT SPOTS BEHIND THE EYES.

38. A. NAJAS, Hansem; Revue, p. 177. Charp. pl. 37.
Length 13 lin.; exp. 18 lin.
Habitat England, Ireland (Haliday).
Blackish bronzed, yellow beneath, with the *abdomen blueish at the end* (♂); *thorax* immaculate (♂), or *with an interrupted yellow line* on each side (♀).

A. viridulum, Charp.; Revue, p. 175.
Similar, but smaller, the *line of the thorax uninterrupted* in both sexes.
In Belgium.

39. A. MINIUM, Harris; Revue, p. 178; Charp. pl. 36.
Length 13 lin.; exp. 17 lin.
Habitat England, Scotland, Ireland.
Carmine-red; *thorax* blackish bronzed, *with a lateral red or yellow stripe; legs black;* anal appendages of the ♂ long, equal; *the lower ones bifid.*

40. A. TENELLUM, Villers; Revue, p. 180.
Length 12 lin.; exp. 14 lin.
Habitat England; local in the south.
Red, *thorax immaculate, blackish bronzed; legs reddish;*

anal appendages of the male very short; the upper with a truncate tubercle; *the lower ones simple.*

†† HEAD WITH A ROUND SPOT ON EACH SIDE BEHIND THE EYES.

41. A. PUMILIO, Charp.; Revue, p. 182. Charp. pl. 39.
Length 10 lin.; exp. 12 lin.
Habitat England, Ireland.
Black; thorax with two blue bands in front; *hind lobe of the prothorax raised, rounded;* abdomen black, the ninth segment blue (♂), or bronzed (♀); *pterostigma of the anterior wings black internally* (♂).

42. A. ELEGANS, Vander Lind.; Revue, p. 188. Charp. pl. 38.
Length 12 lin.; exp. 14 lin.
Habitat England, Scotland, Ireland.
Black; thorax with two blue bands in front; *hind lobe of the prothorax, narrow, much raised;* abdomen black, *the eighth segment blue; pterostigma of the anterior wings black internally* (♂).
N.B. *A. pumilio* and *A. elegans* have each a variety of the ♀ of an orange colour, the thorax without anterior dark stripes.

43. A. PULCHELLUM, Vander Lind.; Revue, p. 197. Charp. pl. 40.
Length 12 lin.; exp. 14 lin.
Habitat England, Scotland, Ireland.
Bronzed, spotted with blue; hinder edge of the *prothorax* divided *into three lobes, the middle one the narrowest and longest*; *second segment* of the abdomen (♂) *with a furcate* bronzed *spot reaching to the hinder edge;* the abdomen of (♀) with two spots at the end of each segment.

44. A. PUELLA, L.; Revue, p. 200. Charp. pl. 41.
Length 12 lin.; exp. 16 lin.
Habitat England, Scotland, Ireland.
Blue, spotted with bronze (♂), or bronzed spotted with blue (♀); hinder edge of the *prothorax divided into three lobes, the middle one sinuated; second segment* of the abdomen (♂) *with a detached furcate* bronzed *spot;* abdomen of the ♀ with no spots posteriorly.

45. A. MERCURIALE, Charp.; Revue, p. 221. Charp. pl. 42.
Length 10 lin.; exp. 14 lin.
Habitat England (collections of Messrs. Dale and Curtis).
Bronzed, spotted with blue; hinder edge of the *prothorax rounded; second segment* of the abdomen (♂) *with a trifid spot reaching to the hinder edge;* tenth segment with a broad notch in both sexes.

46. A. CYATHIGERUM, Charp.; Revue, p. 205. Charp. pl. 42.
Length 12 lin.; exp. 16 lin.
Habitat England, Scotland, Ireland.
Blue, spotted with bronze; hinder edge of the *prothorax rounded; second segment* of the abdomen (♂) *with a heart-shaped spot reaching to the hinder edge;* the *eighth segment* (♀) *with a stout spine* on the under side.

A. hastulatum, Charp.; Revue, p. 209. Charp. pl. 41.
Length 12 lin.; exp. 16 lin.
Blue, spotted with bronze; hinder edge of the *prothorax forming in the middle an obtuse angle; second segment* of the abdomen (♂) *with a lanceolate spot reaching to the hinder edge, and two lateral lines;* no spine beneath the eighth segment of the ♀.
In Belgium.

COLEOPTERA.

Notes on British Geodephaga, with Descriptions of Four New Species (Supplementary to the Geodephaga Britannica).

By J. F. Dawson, LL.B.

Among the captures of the year 1856, that of *Lebia crux-minor* for the first time in *comparative numbers* in this country will be recognized as an important and interesting fact. I have also the pleasure of recording four additional species of British *Carabidæ*, which, though resting at present on a limited number of representatives, are all insects which we should naturally expect to find in England, being very well known in France, &c.

Two others have also been captured, but their claim to be admitted among our indigenous species must, to say the least, be looked upon at present with suspicion. *Chlænius Maillei* has already been exhibited at one of the meetings of the Entomological Society. It was captured near Gurnard's Bay in the Isle of Wight, but as it is a native of the Morea, and is not found in any country between that and England, had most probably (like many other species from various quarters of the world) been accidentally imported. Vessels coming up through the Needles must necessarily pass very near the shore, not far from which the specimen in question was found, as the channel in that part is very narrow. The fact of its having been taken from under moss (if that account

be literally correct) does not in my opinion lessen the suspicion that it came from some vessel passing up the channel, as any of the *Carabidæ* will naturally take refuge under the first convenient substance that affords them concealment.

The other species alluded to is *Agonum elongatum*, Dej., a ♀ example of which was captured as long ago as 1831, by the Rev. C. Kuper, on the banks of Wisbeach Canal near Lowestoff. This species is likewise a native of Greece, a country so dissimilar to England in climate and natural productions, that it seems scarcely probable that an insect which, like *Chlænius Maillei*, is also to be met with in none of the intermediate districts, should be more than an involuntary visitant. At all events we should be scarcely justified in admitting either into the British list, until its title shall have been confirmed by the discovery of additional examples.

Lebia crux-minor, Linn. S. N. ii. 673 (*Carabus*); Dawson, Geod. Brit. p. 17. More than fifty specimens were taken between the end of April and the end of June, 1856, under moss in a little swamp by the side of a wood near Hurstperpoint, Sussex; and others seen at sugar placed on trees to attract *Noctuæ*, chiefly on wet nights, near the same spot. The credit of the discovery of what may be considered an actual colony or metropolis of this rare species, of which merely a few chance specimens had previously occurred at distant intervals and in uncertain localities, is due to Mr. J. Hemmings of Brighton.

Tarus axillaris, Fab. Ent. S. i. 132 (*Carabus*); Dawson, Geod. Brit. p. 22. Not uncommon on the Downs near Lewes, beneath stones in spring and autumn.

Polystichus fasciolatus, Oliv. Ent. iii. 33; Dawson, Geod. Brit. p. 24. Captured by Mr. H. Adams on the 28th of July, crawling on the path-way near the Port Admiral's

house at Sheerness; and on the 18th of August by Mr. Unwin, beneath a heap of stones between Newhaven and Beachy Head.

Carabus intricatus, Linn. F. S. 780; Dawson, Geod. Brit. p. 34. A solitary example has been captured as late as September 9, 1856, in one of the woods near Plymouth: it will be remembered that the captures previously made by Mr. Hore were early in the spring—March or the beginning of April.

Nebria complanata, Linn. S. N. ii. 671 (*Carabus*); Dawson, Geod. Brit. p. 46. The claim of this insect to be included among the Irish species has rested upon a single half-dead individual found on the Arklow Sands. This was at any rate suspicious, and it is therefore satisfactory to be able to establish its undeniable title to be included among the indigenous species of Ireland. Towards the end of July, 1856, Mr. Percival Wright discovered it in abundance about two or three miles from Arklow, hiding among the *Asplenium marinum*, which grows there in profusion, and close to the ground in the clefts of the rocks.

Panagæus 4-pustulatus, Sturm, D. F. iii. 172; Dawson, Geod. Brit. p. 59. Three specimens were captured between the 9th and 24th of May by Mr. Reading on the sea coast at Whitsund Bay; they were running about on some sunny slopes, which are clothed with grass and moss, with occasional furze bushes interspersed.

Licinus depressus, Payk. Faun. i. 110 (*Carabus*); Dawson, Geod. Brit. p. 62. Not uncommon on the Downs near Lewes, under stones in spring and autumn.

Anchomenus livens, Gyll. Ins. Suec. ii. 149 (*Harpalus*); Dawson, Geod. Brit. p. 82. Woods near Lewes and Hurstperpoint, Sussex, at sugar placed on the trunks of trees to attract *Noctuæ*; and in Kent by brushing the hazel.

Anchomenus Ericeti, Panz., Faun. cviii. 6 (*Carabus*); Dej. Spec. *A. fulgens*, Dawson, Geod. Brit. p. 87.

The nomenclature of this species is to be corrected as above, and the entire paragraph at page 87 of *Geodephaga Britannica*, beginning "Dr. Schaum, in his remarks, &c.," must be erased. The supposed typical examples of *Ericeti*, Panz., which Mr. Wollaston brought from Dr. Heer, I found upon examination to be varieties of *A. 6-punctatus*. If these then were genuine representatives of *Ericeti*, it was clear that the latter insect could not = our *A. fulgens*, which is very different; but after all it turned out that they were *not*, but simply varieties of *A. 6-punctatus*, which I pronounced them to be at the time. Dr. Schaum has since lent Mr. Wollaston Panzer's own identical type of *Ericeti*. I have not seen it, but Mr. Wollaston assures me it is very different from the other *supposed* examples; and coincides exactly with our *A. fulgens*, as Dr. Schaum asserted. I, therefore, take this opportunity of correcting a statement, which could not have been made by me, had it not been unluckily based upon false premises.

Anchomenus gracilis, Sturm, D. F. v. 197 (*Agonum*); Dawson, Geod. Brit. p. 91. Specimens have been captured by Mr. Plant near Leicester.

Amara infima, Dufts., Faun. ii. 114 (*Carabus*). Head and thorax shining black; elytra coppery or purplish black; palpi and antennæ pitchy, the base of the former and two joints at the base of the latter clear red. Thorax broad and short, slightly emarginate in front, with its anterior angles obtuse, sides very gradually rounded, not much narrowed behind, posterior angles nearly right angles; disk with an entire distinct dorsal line, slightly depressed before and behind, having two deep foveæ on each side at the base, the inner one one terminating in an irregular striæ above, the

outer one round; both foveæ, as well as the space between them, distinctly punctulated. *Elytra* ovate, rather wider than the thorax, sides very slightly rounded, distinctly punctate-striated, the punctured striæ shallower and smoother as they approach the extremity; underside black, legs pitchy, femora darker, with the tip next the joint of the tibiæ clear red; length $2\frac{1}{4}$ lin.

This insect very nearly resembles *tibialis*, but is easily distinguished by its broader form, especially by the greater width of the thorax in front and the two deep punctulated foveæ on each side close to the base; the elytra also has a broader appearance and its sculpture is more marked.

I have the pleasure of adding this species to the British Fauna on the authority of four examples which were captured on the sand-hills at Deal, and which I detected among a few specimens of *A. tibialis;* the latter insect occurs there in profusion, and I doubt not that among a considerable number of them other examples of *infima* might be found. It is a south of France insect also, but I believe it is somewhat local.

Amara rufocincta, Sahlb., Ins. Fen. 249 (*Carabus*). Pitchy black, shining, sometimes brownish testaceous; the lateral margins of the thorax narrowly red, more distinctly so in paler individuals. *Head* smooth and convex, with an impression on each side before the eyes; antennæ and palpi testaceous red. *Thorax* very broad and ample, slightly narrowed in front, posterior angles right angles or slightly acute, disk convex, dorsal furrow deeply impressed in the centre, less so before and behind, base depressed throughout, having two connected foveæ on each side midway between the dorsal furrow and the posterior angles, the foveæ and the space about them coarsely punctured. *Elytra* oblong, broad but scarcely so wide as the thorax, sides almost straight till

shortly before the extremity, then gradually contracted, convex, deeply striated, the striæ punctured for two-thirds their extent and deepening towards the apex, the outer margin with a series of coarse impressions; under side black, legs red. Length $2\frac{1}{2}-3$ lin. This species has been captured near Reigate, and on the sand-hills at Deal.

Amara brunnea, Gyll., Ins. Suec. ii. 143 (*Harpalus*); Dawson. Geod. Brit. p. 126. Additional Irish localities; North Bull Sands, Dublin; Rossbegh, Kerry.

Harpalus calceatus, Dufts. Faun. ii. 81 (*Carabus*). Elongate, brownish or pitchy black; palpi and antennæ testaceous red. *Thorax* subquadrate, sides rounded in front, slightly narrowed behind, posterior angles right angles, disk transversely wrinkled, with a very distinct dorsal furrow, and the entire posterior margin and angles very densely punctulated, but without foveæ, having merely in their place indistinct or obsolete depressions. *Elytra* striated, striæ impunctate, interstices convex, outer margin finely and thickly punctulated in the middle, more coarsely before and behind; underside pitchy; breast punctured; legs testaceous red. Length $5\frac{1}{2}$ lines.

A single ♀ example was captured near Swansea, as long ago as 1830, by the Rev. C. Kuper. I am surprised that this species should not be common with us, and that its claim to be recorded should even now rest upon a solitary individual. It is plentiful in France, and occasionally enters lighted apartments in the summer evenings; moreover it is a large and conspicuous insect and very unlikely to be overlooked.

Stenolophus Skrimshiranus, Steph. Mand. i. 166; Dawson, Geod. Brit. p. 155. Locally abundant by the side of a ditch near the town of Lewes in April, 1856.

Bembidium obliquum, Sturm, D. F. vi. 160, p. 161; Dawson, Geod. Brit. p. 195, pl. 2, f. E. A third locality

for this species has been discovered by Mr. Hemmings in the neighbourhood of Brighton. It has therefore been found on the south coast, in a midland county, and (Mr. Bold's original example) in the North of England.

Bembidium Clarkii, Dawson, Ann. Nat. Hist. iii. 215 (1849 (*Lopha*)); Geod. Brit. p. 199. *Leja bisulcata*, Chaudoir, Bull. Mosc. t. 17, 2, p. 452 (1844). This is one of the few species hitherto supposed to occur only in England; but we are informed by M. Jacquelin Duval that it is identical with *Leja bisulcata*, Chaudoir, discovered in Southern Russia. This is interesting as affording an additional instance of the community of species between these two countries. It will be remembered that *Lymnæum nigropiceum* has been found only in the Isle of Wight and in Southern Russia. The present species, however, was captured for the first time last autumn in the neighbourhood of Paris. The above synonym must therefore be added: and, though it is of an earlier date than the name employed by myself, it can hardly be retained, having been previously applied to represent different species in the same genus.

Bembidium Sturmii, Panz. Faun. 89, 9 (*Carabus*). Head and thorax brassy black, very shining; the former with two deeply impressed oblique frontal furrows which approximate and unite in front in a point; eyes large and prominent, antennæ pitchy, their basal joint entirely and the next partially testaceous red. *Thorax* cordate, sides broadest and much rounded a little before the middle, narrowed behind, posterior angles acute, disk convex, having the usual dorsal furrow and anterior transverse impression, base with a deep punctuated fovea on each side, and otherwise rugged. *Elytra* oblong-ovate, broad, brassy brown, with the extreme tip, a roundish spot on each side near the outer margin before the tip, and several other angular and longitudinal marks on the

anterior portion, testaceous; convex, deeply punctate-striated, the innermost punctured striæ becoming fainter as they approach the extremity, and the outer ones nearly obsolete: underside black, legs testaceous red. Length 1 line.

Dr. Power has the credit of introducing this species into the British Fauna, having discovered a single example in the autumn of 1855, in Hammersmith marshes; and in July last I was agreeably surprised at recognizing a second specimen in the possession of a friend, who had captured it a few weeks previously on the bank of a pond, above fifty miles from the above locality, thereby proving that it is to be found in more than one district.

COLEOPTERA.

New British Species noticed in 1856.

By E. W. Janson.

1. Agabus pulchellus, Heer; E. Newman, Zool. 5003 (1856).

Captured by G. Wailes, Esq., in Loch Achray, on the north side of Loch Katrine in September, 1853.

2. Helophorus pumilio, Erich. (not Steph.); Rev. H. Clark, Zool. 3051 (1856).
3. Catops spadiceus, Sturm; Murray, Ann. and Mag. Nat. Hist. 2nd Ser. xviii. 21 (1856). Scotland.
4. Catops coracinus, Kellner; Murray, Ann. and Mag. Nat. Hist. 2nd Ser. xviii. 140 (1856.)

Genus ADELOPS, Tellkampf in Erichson's Archiv., 1844, i. 318. *Bathyscia*, Schiödte, Spec. Faun. Subterran. 10 (1849); Trans. Ent. Soc. Lond. n.s. i. 141 (1851.)

This genus, established on a single individual of *A. hirtus*, Tellk. *loc. cit.* (found beneath a stone in one of the branches of the celebrated Mammoth Caves of Kentucky,* at a dis-

* Omitted by Haldeman and Le Conte in the "Catalogue of the Described Coleoptera of the United States," lately published by the Smithsonian Institution.

tance of nearly five English miles from the mouth, and presented to the Royal Museum of Berlin), affords a signal instance of the rapid progress made in our science during the last ten years; eight species, including the one I have now the pleasure of describing, having in that period found a place in the European catalogue.

The absence of eyes at once distinguishes these insects from the members of the genus *Catops*, which they greatly resemble, and denotes the mode of life allotted them; they inhabit caves and other situations inaccessible, under ordinary circumstances, to the rays of the sun, and appear to form the connecting link between the genera *Catops* and *Leptinus*.

5. Adelops Wollastoni, n. sp. Fig. 7.

A. breviter ovatus, ferrugineus vel fusco-testaceus, tenuiter sat dense fulvo-pubescens, subtilissime punctulatus, capite utrinque supra antennas angulatim producto, thorace transverso, basi leviter bisinuato.

Length 1—1$\frac{1}{8}$ *lin.*

Short, ovate, ferruginous or dusky testaceous, finely and rather thickly fulvous pubescent, minutely punctate. Head with the crown depressed, gradually expanding on each side anteriorly as far as the base of the antennæ, where it is suddenly narrowed, thus presenting acute lateral angles; antennæ a trifle longer than the head, two basal joints elongate sub-obconic, third, fourth, fifth and sixth much more slender, of equal width *inter se*, but gradually decreasing in length (three rather longer than broad, six nearly quadrate), seventh suddenly dilated, obconic, eighth much smaller, transverse, ninth and tenth rather broader than the seventh, slightly transverse, eleventh shortish ovate, acuminate at the apex. Thorax twice as broad as long, a little wider than the elytra, gently and evenly rounded at the sides, much contracted in

front, apex slightly emarginate, anterior angles obtuse deflexed, posterior angles produced, acute, closely embracing the humeral angles of the elytra, the base obscurely lobed in the centre, therefore indistinctly bisinuate. Elytra nearly twice as long as the thorax, gently narrowed posteriorly, gradually rounded at the apex, sutural stria evident, evanescent near the scutellum, gradually approximating the suture with which it is confounded ere it reaches the apex; lateral margins narrowly but distinctly margined throughout, *i. e.* from the humeral to the sutural angles. In the male the anterior tarsi are 5-jointed, the two first strongly dilated, the third moderately so, the fourth obconic, slender, the fifth elongate, linear, supporting very small claws. In the female the anterior tarsi are 4-jointed, the basal joint somewhat robust, the second and third short, obconic, the terminal as in the male. In both sexes the tibiæ are moderately spinulose.

I sent examples of the insect above described to M. Jacquelin Duval, not feeling satisfied from the short diagnosis then published of his *A. meridionalis* [Ann. Ent. Soc. Fr. Ser. 3, ii. Bullet. 36 (1854)], whether or not my insect was referrible thereto, apprising him of my doubts, and begging that he would accept the specimens, and, in return, set these doubts at rest. After the lapse of twelve months he courteously sent me word that my insect was specifically distinct. In the meanwhile, however, M. Duval's species had been described by MM. Fairmaire and Laboulbène, in their Faun. Ent. Franc. Col. i. 310 (1855), and figured by MM. Duval and Migneaux, in the Gen. Col. Europ. (Silphides), tab. 35, fig. 175; from these sources I glean that *A. Wollastoni* differs from *meridionalis* in its shorter form, angulated head, and in the elytra presenting no trace of transverse striæ. I may add that a specimen sent to Herr Kraatz of

Berlin was returned by that gentleman as a nondescript *Adelops*.

Taken beneath decayed leaves, near Finchley, at the beginning of August, 1854, at the foot of an old wall, and again, at the same period, in the following year.

I have dedicated this species to T. Vernon Wollaston, Esq., M. A., F. L. S., Author of "Insecta Maderensia," a Treatise "on the Variation of Species, etc. etc."—whose qualifications as a naturalist, liberality, urbanity and purely disinterested and enthusiastic devotion to our science are well and widely known, both here and on the continent—in recognition of the numerous favours received at his hands, and of a debt of gratitude which my best efforts can never liquidate.

6. Myrmedonia cognata, Maerkel in Germar, Zeitschr. f. d. Entom. v. 202 (1844); Kraatz, Naturgesch. d. Insect. Deutschl. ii. 123, 5 (1856); G. R. Waterhouse, Proc. Ent. Soc. Lond. (4th August, 1856); Zool. 5246 (1856).

Found by Mr. Waterhouse in company with *Formica fuliginosa* near Brockenhurst. I met with a single individual on the stump of a recently felled tree at Hampstead on the 3rd of June, 1855.

7. Myrmedonia laticollis, Maerkel in Germar, Zeitschr. f. d. Entom. v. 203 (1844); Kraatz, Naturgesch. d. Insect. Deutschl. ii. 127, 11 (1856); G. R. Waterhouse, Proc. Ent. Soc. Lond., 4 Aug. 1856, Zool. 5246 (1856).

Taken by Mr. Waterhouse near Brockenhurst; by Mr. Edwin Shepherd at Norwood, and by myself near Croydon in company with *Formica fuliginosa*.

8. Myrmedonia lugens, Grav., Erich.; Kraatz, Naturgesch. d. Insect. Deutschl. ii. 126, 9 (1856); G. R. Waterhouse, Proc. Ent. Soc. Lond., 4 Aug. 1856, Zool. 5246 (1856).

Found by Mr. Waterhouse in company with *Formica fuliginosa* near Brockenhurst: previously taken, unaccompanied by the ant, by the same gentleman, early in the spring, at Sydenham.

9. Homalota plana, Gyll., Erich; Power, Zool. 5177 (1856), [erroneously *deplanata*].

The true *Hom. deplanata* has, I believe, never been detected in Britain. Stephens' descriptions refer to *H. plana*, represented in his cabinet by *H. cuspidata*. *H. plana* occurs not unfrequently beneath bark of felled trees, in the neighbourhood of London; I have met with it abundantly at Highgate, Hampstead and Finchley; and Mr. Edwin Shepherd has taken it at Putney.

10. Homalota cuspidata, Erich.; Power, Zool. 5177 (1856).

As before observed, this insect stands in the Stephensian cabinet labelled *Homalota plana;* Stephens's descriptions, however, refer to the true *plana*, and are abridged from Gyllenhal, the Latin diagnosis being copied *verbatim*. I have found this insect at Colney-hatch, Hampstead and Mickleham; it occurs sparingly beneath the bark of dead trees.

11. Homalota flavipes, Grav., Erich.

Found by myself in nests of *Formica rufa* at Hampstead and Highgate, and by Mr. Waterhouse near Erith.

12. Homalota confusa, Maerkel in Germar, Zeitschr. f. d. Entom. v. 215, 41 (1844); Kraatz, Naturgesch. d. Insect. Deutschl. ii. 264, 71 (1856).

Several specimens taken by Mr. Waterhouse in the company of *Formica fuliginosa* near Brockenhurst.

13. Homalota anceps, Erich.

Taken by myself in nests of *Formica rufa* near Highgate, and by Mr. Waterhouse near Erith.

14. Oxypoda vittata, Maerkel in Germar, Zeitschr. f. d. Entom. v. 219 (1844); Kraatz, Naturgesch. d. Insect. Deutschl. ii. 163, 4 (1856); G. R. Waterhouse, Proc. Ent. Soc. Lond., 4 Aug. 1856, Zool. 5246 (1856).

Found by Mr. Waterhouse near Brockenhurst, and subsequently by myself near Croydon in company with *Formica fuliginosa*.

15. Oxypoda hæmorrhoa, Sahlb.; Kraatz, Naturgesch. d. Insect. Deutsch. ii. 184, 34 (1856). *Aleochara hæmorrhoa*, Sahlb., Ins. Fenn. i. 355, 20 (1834).

I have repeatedly met with this insect in nests of *Formica rufa* at Hampstead and Highgate; Mr. Waterhouse has found it with the same ant near Erith.

16. Oxypoda formiceticola, Maerkel in Germar, Zeitschr. f. d. Entom. iii. 213, 10 (1841); Kraatz, Naturgesch. d. Insect. Deutschl. ii. 182, 32 (1856).

I have found this species, but very sparingly, in nests of *Formica rufa*, both at Hampstead and Highgate; Mr. Waterhouse has taken it with this ant near Erith.

Genus THIASOPHILA, Kraatz, Naturgesch. d. Insect. Deutschl. ii. 69 (1856).

The insects comprised in this genus differ from the *Aleocharæ*, with which they had until recently been associated, in having the maxillary palpi 4-jointed, the labial palpi 3-jointed, the ligula more elongate and more deeply cleft, the thorax uneven, its posterior margin waved and its hinder angles nearly rectangular. Both species appear to be exclusively confined to ants' nests, viz. one to those of *Formica rufa*, the other to those of *Formica fuliginosa*; the first only has been detected in Britain.

17. Thiasophila angulata, Erich.; Kraatz, Naturgesch. d. Insect. Deutschl. ii. 70, 1 (1856). *Aleochara an-*

gulata, Erich.; Käf. d. Mark Brand. i. 360, 11 (1837); Gen. et Spec. Staph. 175, 35 (1839).

Taken by myself at Hampstead in November, 1855, and subsequently at Highgate in nests of *Formica rufa*; Mr. Waterhouse has likewise met with it under similar circumstances near Erith.

Genus HOMOEUSA, Kraatz, Naturgesch. d. Insect. Deutschl. ii. 76 (1856).

This genus, recently established by Herr Kraatz on the species which follows, and which had previously been located in *Euryusa*, may be at once distinguished by its pentamerous anterior tarsi, broader form, the acutely rectangular posterior angles of the thorax, and the abdomen narrowed from the base to the apex; and, furthermore, the ligula and the labium and its palpi, but which I have not had an opportunity of examining, afford important distinctive characters.

18. HOMOEUSA ACUMINATA, Maerkel; Kraatz, Naturgesch. d. Insect. Deutschl. ii. 78, 1 (1856). *Euryusa acuminata*, Maerkel, Ent. Zeit. Stett. iii. 143, 5 (1842), in Germar, Zeitschr. f. d. Entom. v. 228, 79 (1844); T. V. Wollaston, Zool. 5178 (1856).

A single specimen taken by Mr. Wollaston in a nest of *Formica fusca*, beneath a stone, near Bromley, Kent.

Having recently received from Herr Maerkel an example of his *E. acuminata*, and carefully compared Mr. Wollaston's specimen therewith, I am enabled unhesitatingly to pronounce their specific identity.

19. ATEMELES PARADOXUS, Grav.; Kraatz, Naturgesch. d. Insect. Deutschl. ii. 116, 1 (1856). *Lomechusa paradoxa*, Erich.

A single example found by Mr. Waterhouse at Hampstead, in company with *Formica fusca*.

20. Leptacinus formicetorum, Maerkel in Germar, Zeitschr. f. d. Entom. iii. 216, 19 (1841).

Found by myself in nests of *Formica rufa* at Hampstead and Highgate, and, I believe, taken likewise by Mr. Waterhouse, with the same ant, near Erith.

21. Quedius brevis, Erich. Gen. et Spec. Staph. 535, 17 (1840).

At the period Erichson was engaged on the great work above cited, this insect appears to have been of great rarity in collections, and his description was drawn up from the female only, of which he had a very limited number of specimens before him. Herr Maerkel, however, shortly after, met with it in considerable numbers in Saxony, and observes, in Germar, Zeitschr. f. d. Entom. iii. 217, 21 (1841), that it is subject to great variation in the puncturing of the thorax, *viz.* that the number of punctures in the dorsal series varies from one to three, and that occasionally one or other of these is wanting on one side; he furthermore indicates that the male differs from the female in having the anterior tarsi strongly dilated, and the sixth abdominal segment rather deeply notched, as is usual in the genus.

I have taken a fine series of this insect, exhibiting nearly all the variations mentioned by Herr Maerkel, in nests of *Formica rufa*, at Hampstead and Highgate, and Mr. Waterhouse has met with it, but very sparingly, with the same ant, near Erith.

Genus HETÆRIUS, Erich. in Klug, Jahrb. d. Insectenk. i. 156, (1834).

The present genus, of which the following is the only recorded species, stands out in bold relief amongst the legion of generic subdivisions into which modern systematists have hewn the family *Histeridæ:* the uni-articulate cylindrical club of the antennæ, the angularly dilated tibiæ and its

peculiar facies, happily conveyed by our artist, at once distinguish it.

22. HETÆRIUS SESQUICORNIS, Preyssler. Fig. 7.

Hister sesquicornis, Preyssler in Mayer, Sammlung Physikalischen Aufsätze, ii. 3, Tab. 3, fig. 26 (1792), *teste* Schmidt. Goebel in Ent. Zeit. Stett. xiv. 164 (1853). *Hister quadratus*, Kugelan in Schneider, Mag. Pt. iv. 529, 21 (1794); Payk. Mon. Hist. 96, Tab. xi. fig. 3 (1811); Sturm, Deutschl. Faun. Ins. i. 216, Tab. 17, fig. B. (1805). *Hetærius quadratus*, Erich., Käf. d. Mark Brand. i. 666 (1839); de Marseul, Ann. Ent. Soc. Fr. Ser. 3, iii. 140, Tab. 9, fig. 28 (1855); E. W. Janson, Proc. Ent. Soc. 5 May, 1856, Zool. 5151 (1856).

Found by myself at Hampstead, in nests of *Formica flava* and *fusca*, beneath stones on a loamy hedge-bank having a western aspect, in 1848 and again in 1856, where I repeatedly and assiduously searched for it during the intervening years, but without success.

Observation. Neither Paykull's nor Sturm's figures represent the antennæ correctly.

23. SAPRINUS PICEUS, Payk., Gyll., Erich., de Marseul, Ann. Ent. Soc. Fr. Ser. 3, iii. 505, Tab. 19, fig. 120 (1856). *Hister piceus*, Payk. Mon. Hist. 81, Tab. vii. fig. 7 (1811).

A single indigenous example only, taken by Mr. Waterhouse, last November, in a nest of *Formica rufa*, near Erith, has come beneath my notice. Stephens's description of *Dendrophilus piceus*, Illustr., Mand. iii. 160, 5 (1830), Manual, 152, 1226 (1839), is copied from Gyllenhal, the Latin diagnosis *verbatim*, but the insect placed to represent this species in his cabinet is very distinct and answers in no respect to the description, save perhaps in colour. The spe-

cies now under consideration differs totally in *habitus* from its congeners, its impunctate semi-opaque surface, long, slender, obsoletely armed legs, its pitchy red colour and sub-globose form, alienate it from the *Saprini;* but M. de Marseul, who has bestowed especial attention on the *Histeridæ*, and whose elaborate Monograph of the family, above cited, is well known to many of our readers, places this species in the genus *Saprinus*, remarking "Elle a un facies tout différent des autres *Saprinus*, on dirait un *Tribalus* on un *Dendrophilus;* mais aucun caractère de valeur ne la sépare de ce genre." I cannot, however, resist the conviction that future investigation will assign this insect to a distinct genus; lack of specimens at present precludes me from entering farther on the subject.

24. NITIDULA FLEXUOSA, Fab. Erich., T. J. Bold, Zool. 5111 (1856).

Mr. Bold considers that the specimens taken by him, near Newcastle-upon-Tyne, were probably introduced, and that the species cannot, upon their testimony, be looked upon as truly indigenous.

Genus OXYLÆMUS, Erich., Naturgesch. d. Insect. Deutschl. iii. 282 (1845).

The species constituting this genus, of which the two following are the sole recorded representatives, bear on a cursory view, a certain resemblance to some of the members of the genus *Rhyzophagus*, from which, however, they may be at once distinguished by their more cylindrical form, quadrifoveolated thorax, coarse sculpture, and tetramerous tarsi; other characters, on which I must not now enter, involving their location in a distinct family, have been elicited by the patient investigation of Erichson, who places this genus among the *Colydidæ*, group *Colydini*, after *Teredus*. *Oxylæmus* differs from *Teredus* in having the antennæ

apparently consisting of ten joints only, the eleventh being widest at its base, nearly hemispherical, and so closely applied to the apex of the tenth as to be not very readily distinguishable; the capitulum or club has thus the appearance of being solid or uni-articulate, whereas in *Teredus* it is distinctly bi-articulate, the eleventh joint being much narrower at its base than in the middle, globose: in *Oxylæmus* the prosternum is produced, forming an acute triangular projection beneath the head, not present in *Teredus*.

25. Oxylæmus cylindricus, Panz., Erich., Naturgesch. d. Insect. Deutschl. iii. 283, 1 (1845). *Lyctus cylindricus*, Panzer, Faun. Ent. Germ. Fas. 35, fig. 18 (1796). Fig. 1.

A single specimen only of this species has come under my notice, it was captured by Mr. Edward Sheppard, beneath bark of oak, near Lyndhurst.

26. Oxylæmus variolosus, Leon Dufour.

Rhyzophagus variolosus, Dufour in Bullet. de la Soc. des Sciences, Lettres et Arts de Pau, 94, 591 (1843); von Siebold in Ent. Zeit. Stett. x. 311 (1849). *Oxylæmus cæsus*, Erich., Naturgesch. d. Insect. Deutschl. iii. 284, 2 (1845), *teste* Schaum, Ent. Zeit. Stett. xi. 181 (1850); Sturm, Deutschl. Faun. Ins. xx. 64, Tab. 370 (1849).

Of all the additions made during late years to our list, the present is perhaps the most interesting, and to it I beg to call the earnest attention of those who are pursuing the important subject of geographical distribution.

Three specimens of this insect have come under my notice.

The first taken by my assiduous and successful friend Mr. T. P. Dossetor, on the 6th of October, 1850, at Colney-hatch, Middlesex, crawling up the trunk of an oak, within a short distance of a fungus, whither it was probably on its way.

The second found by Mr. Pelerin in October, 1854, in a sand-pit at Charlton, Kent.

The third captured by Mr. Dossetor, on the 19th of the present month, in brushing amongst herbage in the immediate vicinity of the tree on which the first individual was found, and presented to me, still alive, by that gentleman.

It appears to be a species of excessively rare occurrence on the continent, and to have been found exclusively in high mountainous districts; the only two instances, I believe, on record of its capture are, by M. Leon Dufour in "Excursion entomologique dans les Montagnes de la Vallée d'Ossau" who says "Habite l'écorce du chêne;" and by Herr Gressner, in company with *Formica fuliginosa*, in Saxony.

27. Antherophagus nigricornis, Fab.; T. J. Bold, Zool. 5003 (1856).
28. Tychius flavicollis, Schönh. (not Kirby), Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 31, 4 (1856).
29. Tychius hæmatocephalus, Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 31, 3 (1856).
30. Smicronyx cicur, Reich., Schönh., Germ.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 31, 2 (1856).
31. Baris Lepidii, Germar, Col. Spec. Nov. 200, 322 (1824). *Baridius Lepidii*, Schönh.

On the 24th of March, 1848, I met with this insect in profusion in a marsh near Tottenham, Middlesex, beneath rejectamenta of the river Lea. As I had then just commenced collecting *Brachelytra*, and ought else interested me but little, I secured but few specimens; the major portion of which were at the time distributed among my friends and correspondents under the name of *Baris picicornis*, to which I negligently without examination referred them. It probably inhabits the stem of some marsh plant. Redtenbacher says it feeds in the stalk of the cauliflower. As it is not

improbable that the present species may have been confounded by others with the nearly allied *B. picicornis*, I have drawn up, as briefly as practicable, the distinctive characters of the two species.

Baris picicornis, Marsham, Ent. Brit. 276, 115 (1802), Steph. *B. Abrotani*, Germar, Col. Spec. Nov. 202, 324 (1824); *Baridius picicornis*, Schönh., Walton.

Steel blue; rostrum finely, conspicuously and thickly punctate above, deeply and coarsely at the sides. Thorax thickly and deeply punctate, the punctures having but a slight tendency to assume an oval form. Elytra widest at the shoulders, gradually narrowed to the apex; striæ very deep, impunctate, unless viewed under a strong magnifying power and in a favourable light, when traces of very fine, closely set punctures are observable at the bottom of them.

Found at the roots of *Reseda lutea*. In warm still weather the insect may occasionally be seen at the base of the lower lateral shoots or branches, but, according to my experience, never on the leaves or upper portions of the plant.

Baris Lepidii, Germar. *loc. sup. cit.*

Deep blue-black. Rostrum very finely, scarcely perceptibly punctate above, deeply strigose at the sides behind the antennæ. Thorax sparsely and deeply punctate, the punctures almost linear. Elytra distinctly widest a little before the middle, thence rather abruptly narrowed towards the apex; striæ deep, distinctly, remotely punctate.

32. Orchestes rufus, Oliv.; Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 32, 3 (1856).

33. Orchestes Iota, Fab. Germ., Gyll., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 33, 9 (1856).

34. Cœliodes subrufus, Herbst, Gyll., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 35, 4 (1856).
35. Bagous limosus, Gyll., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rynchoph. 36, 2 (1856).
36. Bagous Petrosus, Herbst, Germ., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 36, 3 (1856).
37. Bagous Frit, Herbst? Gyll., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 36, 4 (1856).
38. Bagous lutulosus, Gyll., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 36, 5 (1856).
39. Pachyrhinus canaliculatus (Kirby), Schönh. Supp.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 38, 8 (1856).
40. Ceutorhynchus impressicollis (Little); Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 39, 12 (1856).

Mr. Walton says "*nec depressicollis*," Gyll., under which name I have cited it in the Annual List, 1855.

41. Ceutorhynchus Crux, Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 40, 19 (1856).

Not *Aubei*, Schönh., according to Mr. Walton, under which specific title it appears in the Annual List of 1855.

42. Ceutorhynchus crassidentatus (Marshall), Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 40, 20 (1856).
43. Ceutorhynchus uliginosus (Walton), Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 40, 21 (1856).
44. Ceutorhynchus biguttatus (Waterh.), Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 41, 28 (1856).
45. Ceutorhynchus hispidulus (Stevens), Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 41, 30 (1856).
46. Ceutorhynchus chalybæus, Germ., Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 41, 33 (1856).

47. AMALUS MINIMUS, Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 42, 3 (1856).

48. GYMNETRON COLLINUS, Gyll. Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 44, 8 (1856).

Observation. *Gymnetron collina*, Steph. Man., is referred by Mr. Walton to *G. Pascuorum*, Gyll.

49. MIARUS PLANTARUM (Dej.), Schönh., Germ.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 44, 2 (1856).

50. PHLŒOPHAGUS SPADIX? Herbst, Schönh.; Walton, Brit. Mus. Cat. of Brit. Rhynchoph. 46, 2 (1856).

Genus CRYPHALUS, Erich. Archiv., 1836, I., 61.

Distinguished from *Bostrichus* by the antennæ having the funiculus quadriarticulate; in *Bostrichus*, as restricted by Erichson, it consists of five joints.

51. CRYPHALUS BINODULUS (Weber), Ratzeb., Forst. Insect. i. 163, Tab. 13, fig. 18 (1837); E. W. Janson, Proc. Ent. Soc. Lond., 1 Sept. 1856; Zool. 5305 (1856). Fig. 9.

I found several specimens in the bark of a dying aspen (*Populus tremula*), near Highgate, at the end of August and beginning of September.

52. MONOTOMA CONICICOLLIS, Aubé, Ann. Ent. Soc. Fr. vi. 455, 1, Tab. 17, fig. 1 (1837).

Taken by myself in a nest of *Formica rufa* near Highgate.

53. MONOTOMA ANGUSTICOLLIS, Gyll., Aubé, Ann. Ent. Soc. Fr. vi. 457, 2, Tab. 17, fig. 2 (1837). *Cerylon angusticolle*, Gyll. Ins. Suec. iv. app. 634 (1827).

Found by myself in a nest of *Formica rufa* near Highgate.

The foregoing list will have made the reader acquainted with the publication of Mr. Walton's Catalogue of British Rhynchophora. In reference thereto, I consider it my duty

to state, that no sooner did the liberal and learned author ascertain that I had undertaken a synonymic enumeration of the British *Coleoptera*, than he forthwith transmitted me his manuscripts, with the unqualified permission to avail myself of the valuable and otherwise unattainable information with which they were replete. Limited leisure and consequent slow progress in my task, rendering it probable that a considerable period would elapse ere I arrived at this group, Dr. Gray suggested to Mr. Walton that his Catalogue should be immediately made available to the public. To this he acceded, and, on the 13th of the present month, an unostentatious duodecimo in the familiar official blue wrappers—entitled "A List of the British Curculionidæ, with Synonyma. By John Walton, F. L. S., &c. London. Printed by order of the Trustees. 1856"—was published by the authorities of the British Museum.

London,
October 31*st*, 1856.

Postscript.

Antherophagus nigricornis, F., is *A. silaceus*, Gyll., Steph., and should, therefore, not have been included in the foregoing List. The Fabrician name has priority.

54. Tropideres sepicola, Herbst.

A single example found on the 18th of August last, by Mr. F. Plant, of Leicester, in a decayed oak bough, of which he had carried home a bag-full for examination from Buddon Wood, near Quorndon, Leicestershire. The specimen was sent up for determination to Mr. F. Smith, and has been identified by that gentleman with continental examples in the National Collection. A figure of it will, with our Editor's permission, be given in the plate of next year's Annual.

November 24*th*, 1856.

COLEOPTERA.

Observations on the Myrmecophilous Coleoptera, or Ants-Nest Beetles of Britain. Accompanied by plain Instructions for obtaining them, and a List of the Species hitherto ascertained as indigenous.

By Edward W. Janson, Sec. Ent. Soc.

Most of my readers are doubtless aware that ants, however hostile to their fellow insects in general, evince the greatest amity for others, with whom they not only share their habitations, but watch with the greatest solicitude; bearing them tenderly back should they stray aboard, and hurrying them off to the innermost recesses of their subterranean burrows on the approach of danger; I allude to *Claviger testaceus*, Preyssler (*foveolatus*, Müll., Westw., Steph.), and *Atemeles emarginatus*, Grav. (*paradoxus*, Steph.), which have long since found a place in our lists, and whose habits have been familiarly described in our own language. But perhaps few are prepared to learn that nearly fifty species of *Coleoptera* have been ascertained by continental Entomologists to pass at least a portion of their lives exclusively in the nests of various species of ants. Such, however, is the fact elicited by the assiduous investigations of Aubé and Chevrolat in France; the two Maerkels, von Kiesenwetter, Grimm and others in Germany; Mannerheim in Finland; Schiödte in Denmark, and Motschoulsky in Russia.

The apathy evinced by our collectors, some of whom must have been well aware of the success achieved by our continental brethren in the examination of ants' nests, appears to me attributable to several causes. In the first place, the major portion of the insects attendant on ants pertain to the *Brachelytra*, a group of *Coleoptera* almost universally neglected in Britain, the investigation of which Stephens himself appears always to have postponed, *de die in diem*, alas! until too late, throwing them in, *rudis indigestaque moles*, as mere ballast at the end of his works, although indicating their true position after *Necrophaga* in his synthetical tabulation. The example thus set was almost unexceptionally followed: collectors pinned the labels in their cabinets in the sequence in which they were presented to them in the "Nomenclature," in most cases omitting the *Brachelytra* altogether, and thus the existence of a group, reckoning probably not far short of a fourth of our indigenous *Coleoptera*, has been generally ignored.

Another cause, to which the ignorance prevailing with respect to our ants-nest insects may in a great measure be ascribed, is the lack of that important, nay essential, element of success in all research—an acquaintance with the *modus operandi*. To supply this is one of the chief objects of the present paper.

The ants, to which the attention of myself and the two congenial friends with whose names the reader will have become familar in the "List of new species," had been exclusively devoted, are five in number.

1. *Formica rufa*, L. (the Wood Ant).
2. *Formica fuliginosa*, Latr. (the Jet Ant).
3. *Formica fusca*, L. (the Ash-coloured Ant).
4. *Formica flava*, De Geer (the Turf or Common Yellow Ant).

5. *Myrmica rubra*, L. (the Red Ant), with which we have probably hitherto confounded one or more of the allied species.

We have not, up to the present time, been able to find a colony of *Formica cunicularia*, Latr. (the Mining Ant). Mr. F. Smith, in his British Museum "Catalogue of British Aculeate Hymenoptera" (1851), gives Highgate as a locality for this species; but the spot on which the nest was situate, once so wild and lovely, is now occupied by a square mass of bricks and mortar, yeleped "an eligible family residence," beneath which lies the dust of the last member of that once busy, happy throng. Those who have an opportunity of examining the nests of this species, which generally constructs its habitation in old decaying trees, especially oaks, will probably find a recompense for their trouble in the discovery of *Euryusa sinuata*, at present unknown as British.

Formica rufa, as its popular appellation denotes, frequents woods, where it excavates numerous capacious cells in the earth, raising over them a superstructure in the form of a conical hillock, consisting of fragments of twigs, leaves, pebbles, in fact of any dry portable object falling within its reach. The purport of this mound appears to be to shelter the nest itself from cold and more especially from wet. These hillocks in the course of years gradually attain formidable dimensions. On the first warm days in March, sometimes at the end of February, the wood ant awakens from its long winter's sleep and may be seen basking in clusters on the hillocks; this is the period for commencing ants-nest operations.

Having conveyed a supply of large rough stones—smooth ones will not do—or failing these, bricks, to the wood which is to be the scene of action, and where, I presume, are found

at least several colonies of the ant, place three or four of them around the hillock on its sloping sides: treat all the nests in the same manner. The nests must be visited as frequently as practicable during the greater part of the year; nearly all the beetles enumerated in the subjoined list as cohabiting with this ant were found either on the under surface of the stones or beneath them. *Myrmedonia humeralis*, however, I have only once met with in a solitary individual, beneath the stones; but occasionally in some numbers under leaves and at the roots of grass in the immediate vicinity of the nest.

As spring advances and the ants betake themselves to labour at the extension of the hillock, a piece of old, rough, dry wood should be placed on the summit; this will in a few days be gradually covered by the newly brought material, and should be occasionally withdrawn and smartly tapped over a large sheet of paper or cloth; it was thus I succeeded in taking *Dinarda Maerkelii*, and, in the autumn, *Monotoma angusticollis* and *conicicollis*.

The examination should always be made early in the morning, before ten; in the heat of the day I never met with success. A fine morning succeeding a wet day after dry weather is peculiarly favourable, and should always be devoted to a trip to the ants' nests.

In the sultry months of July and August, the ants' nests should not be touched: my searches have ever been fruitless at that period of the year;* the young brood of ants, upon

* Although the only specimens of *Dinarda Maerkelii* I have yet secured occurred on the 13th of July and 24th of August, I am nevertheless disposed to think that had I used the pieces of wood, above recommended, at an earlier period of the year, I should probably have met with it more abundantly, as on the continent it is always taken early in the spring, and occasionally appears again late in the autumn.

which the welfare of the colony will next year mainly depend, is now assuming the imago state, and the old workers exhibit an irritability not observable at other times.

At the end of August or beginning of September, the collector should resume his researches. Several of the species found in the spring re-appear in the autumn, and two—*Monotoma angusticollis* and *conicicollis*—are to be met with then only. He that would succeed in the investigation of ants' nests must be prepared to fail; according to my experience about one nest only in twenty contains beetles: during the last three years I have tried upwards of a hundred nests, which has involved the transport in some cases for miles of no trifling weight of stones and bricks, for these are not to be found in woods, but by dint of sheer perseverance I have discovered within the metropolitan district by far the greater proportion of the species known in France and Germany to frequent the nests of *Formica rufa*.

In France, I am informed, a most reprehensible plan is practised of tearing the ant-hill to pieces, throwing it into a sieve, and sifting it over a white cloth; I presume that this proceeding is to a certain extent successful, but I think that every rightminded person will bear with me in condemning such wanton destruction as totally unjustifiable, for sooner or later the entire colony must miserably perish. A gentleman, with whom I once expostulated on the cruelty of this plan, gravely assured me that he always restored the hillock to its previous state, as though these industrious, indomitable creatures heaped up sticks and stones without plan or order. Would the confused mass of material he raised prevent the first rains which fell from penetrating the nest, flooding the

Maerkel says (Germar, Zeitschr. f. d. Entom. iii. 215) that "of all the *Myrmecophili* this makes its appearance the earliest in the year, often, in favourable weather, in the first days of March."

subterranean cells and involving its inmates in certain death? Let him convert a wax taper into honey-comb, or an old post into the symmetrical nest of the wasp—I will then admit his competency to rebuild an ant-hillock.

To urge the inconvenience to which the plan of the French Entomologists must subject the operator, and of which Mr. Douglas, in his "World of Insects," p. 240, gives an amusing, but I can vouchsafe authentic account, will, I fear, not deter some from at all events essaying it; there are, I am sorry to say, those in our ranks, whose sole object is to *get up*, as it is styled, *a collection*, regardless of *how* this aim is attained, who would appear with the disciples of Loyola to hold that the end justifies the means. As a warning to these, I will state that in France the examination of ants' nests has long been strictly forbidden, it having soon been discovered by the proprietors of woods, and others interested in the preservation of game, that the reckless proceedings of the Entomologists threatened speedily to extirpate the ants, and thus deprive the young pheasants and other game birds of their chief source of subsistence. The course I adopt, and have above described, is, I believe, invariably followed in Germany, as it occasions but little discomfiture and no injury to the ants.

Formica fuliginosa generally constructs its habitation in the interior of hollow trees, especially oaks. The nest itself is usually inaccessible; the entrance to it, however, will be readily found by watching the streams of ants; it is nearly always situated at or near the roots of the tree. On examination it will be observed that the ants have ejected from it a mass of comminuted, moist and fermenting wood, which should be taken up quickly, thrown on to a sheet of paper or white cloth, and carefully looked through. The bark surrounding the entrance should then be closely searched; it is

on this that I have taken the scarce and pretty *Amphotis* (*Nitidula*, Steph.) *marginata;* the sodden wood-dust and fragments should now be again placed in the spot whence they were taken.

The next step is carefully to search all round the base of the tree at its junction with the ground: if herbage grows here, press it gently back, and narrowly investigate the space between it and the tree; here may be found *Myrmedonia laticollis*, which, rolling its abdomen over its thorax, pertinaciously simulates death, and thus often eludes even the keen eye of the collector. Attention may now be turned to the trunk of the tree: the inequalities in the bark should be carefully peered into; snugly ensconced therein, and likewise running among the ants, which it so closely resembles in size, colour and gait, as to be with difficulty distinguished, the beautiful *Myrmedonia funesta* occurs. The glittering cohorts ascending and descending the trunk in such admirable order form, however, but a fraction of the vast army which garrisons the tree. It is more than probable that the collector will, long ere his operations have arrived at the present stage, have received ample intimation that a large proportion of the colony is actively engaged on *terra firma*, and, unless he has instinctively taken a precaution, the necessity of which I ought, perhaps long since, to have impressed upon him—namely, of binding the trouser legs and coat sleeves tightly about the ankles and wrists—he will, I fear, have become painfully aware that *Formica* is as zealous and persevering an investigator of *Homo*, as the man is of the ant. Upon a careful inspection of the ground it will be perceived that the ants depart from and return to the nest by certain tracks or paths; these should be followed attentively for some distance, and stones, chips of wood, or dead leaves, lying in or beside them, lifted up and examined.

Formica fusca delights in light loamy banks, especially such as have a western aspect, and are thus accessible to the first warm rays of sunshine. Its nests are subterranean, and consist of a succession of cells connected by narrow passages; the entrance is almost invariably situate beneath a stone: on lifting this carefully, so as not to disturb the adjacent earth, which, should it fall in, would completely thwart the object in view, a sort of vestibule or ante-chamber, varying in size according to the magnitute of the superimposed stone of which it forms the roof, presents itself; the stone having been placed in a cloth or shallow bag, the floor of this chamber must be minutely examined—here it is that *Hetærius sesquicornis*, Preyssler (*quadratus*, Payk., Eric.) occurs, but the ants should be narrowly watched as they retreat, which they invariably do in all haste, to the adjoining cell, for I have more than once taken the beetle from the mouths of its foster parents as it was being borne off to the interior of the nest. The floor of the vestibule being thoroughly searched, the cloth or bag should be opened and the stone taken out and examined, for it is possible that some rarity may have been reposing or promenading on its under surface at the time it was withdrawn. The investigation of the nest is now completed for the day; let the stone be carefully replaced in precisely the same position it previously occupied, and the collector proceed in search of others, treating all with which he meets in the same way. And if after a long day's search, weary and perhaps disappointed at not having found *Hetærius*, let him not, I entreat, churlishly destroy the homes of the unoffending ants, and with them all chance of future success—the morrow may prove more propitious; this I can assure him, the simple plan just described is the one I have invariably pursued, vainly day after day for seven years it i true, but at length successfully.

On the first warm days in May, *Atemeles emarginatus* and *paradoxus* makes its appearance on banks tenanted by this ant, and may be seen running in the vicinity of the nests hotly pursued by its anxious guardians; let a careful watch be kept on the ants themselves, as many may be arrested on their return bearing the *Atemeles*, complacently rolled up, in their mouths. I have likewise taken, by brushing herbage in the neighbourhood of the nests of this ant, the rare *Aleochara ruficornis*, Grav. (*Ceranota Daltoni*, Steph.), and have little or no doubt that it is a truly Myrmecophilous insect, although not hitherto recorded as such.

Formica flava, when inhabiting meadows or the green sward of the woodland, constructs its abode in and beneath a hemispherical mound of earth, sometimes entirely the result of its own toil, but occasionally, I have observed, it avails itself of the hillocks thrown up by the mole. Where, however, stones abound, it forms its nest after the fashion of those of *F. fusca*. It is to the latter kind of nests that I would especially direct the collector's notice, for all my exertions have hitherto proved unavailing in the detection of *Myrmecophili* in the mounds.

In chalky districts, more particularly on hill sides, the flints, which lie scattered in countless numbers, should be carefully lifted, never omitting the precaution, if ants are observed beneath, of quickly enveloping the stone in a cloth: in the cells thus exposed to view the wonderful *Claviger testaceus*, Preyssler (*foveolatus*, Müller, Westw., Steph.) is found; and here I have twice met with a species of *Trichonyx*, concerning the identity of which, not feeling certain, I had better at present observe silence. I think it right again to remind the collector, that he must watch the ants attentively as they retire, for they almost invariably endeavour to carry off the beetles, and that the cells being well examined, and all cavities

on the under surface of the flint well searched, this should be replaced in its former position. At Mickleham, where, in the spring and early summer, *Claviger testaceus* might formerly to a certainty be found, I have for the last two years repeatedly but fruitlessly looked for it; but few colonies of the ant, which once abounded, are now to be met with: this I am inclined to attribute mainly if not entirely to the omission, during a series of years, on the part of those engaged in searching for the *Claviger*, to replace the stones over the ants' nests, thus leaving the inmates to perish. In Germany and France, a second species of *Claviger* (*C. longicornis*, Müller) is found in the nests of this ant; if assiduously searched for, it would probably be met with here.

Myrmica rubra occurs in similar situations, and constructs its nests in the same way as the preceding species; the mode of search is therefore identical. This ant is not in good repute with continental Entomologists, as beetles are rarely found in its company; with it, however, *Myrmedonia* (*Astilbus*, Steph.) *canaliculata* usually abounds, and I have likewise occasionally met with a solitary specimen of *Atemeles emarginatus*, and once, near Dorking, a single individual of the scarce *Staphylinus latebricola*, Grav. (*æriceps*, Kirby, Steph.)

I would remark, that an investigation of the nests of several other species of ants, not alluded to in this paper, would probably result in important discoveries. On the part which the *Myrmecophili* play in the economy of the ants' nest, neither time nor space permit me, on the present occasion, even to touch; the consideration of this important question must of necessity be deferred until a future opportunity. My primary object, as I have before stated, in hurriedly penning these lines, is to point out *how* ants' nests may be profitably searched; and, furthermore, by enumerating the

riches already discovered, to offer a substantial stimulus to those who may feel disposed to turn their attention to this most interesting inquiry. And, in conclusion, I earnestly invite those who may meet with any difficulty to address me; and I give them the assurance that my best efforts shall be exerted to smooth the path, and such information as I possess be most cheerfully communicated.

A List *of the* Myrmecophilous Coleoptera *at present known to inhabit Britain, together with an indication of the Species of Ant with which they are usually found associated.*

Trichonyx ———— ?	Formica flava.
Claviger testaceus, Preyssl. . .	——— flava, and fusca.
Myrmedonia canaliculata, F. . .	——— flava, and Myrmica rubra.
——— limbata, Payk. . .	——— flava, and fuliginosa.
——— humeralis, Grav. .	——— rufa.
——— cognata, Maerk . .	——— fuliginosa.
——— funesta, Grav. . .	——— fuliginosa.
——— laticollis, Maerk. .	——— fuliginosa.
——— lugens, Grav. . .	——— fuliginosa.
——— Haworthi, Steph. .	——— rufa ?
——— collaris, Payk. . .	Myrmica rubra ?
Homalota flavipes, Grav. . . .	Formica rufa.
——— confusa, Maerk. . .	——— fuliginosa.
——— anceps, Eric. . . .	——— rufa.
Oxypoda vittata, Maerk. . . .	——— fuliginosa.
——— haemorrhoa, Sahlb. .	——— rufa.
——— formicetícola, Maerk. .	——— rufa.
Aleochara ruficornis, Grav. . .	——— fusca.
Thiasophila angulata, Eric. . .	——— rufa.
Homoeusa acuminata, Maerk.* .	——— fusca.
Dinarda Maerkelii, Kiesw. . .	——— rufa.
Lomechusa strumosa, F. . . .	——— rufa.

* In Germany this species appears to be found with *Formica fuliginosa* exclusively.

Atemeles paradoxus, Grav. . .	Formica fusca.
——— emarginatus, Grav. . .	——— fusca, and Myrmica rubra.
Leptacinus formicetorum, Maerk.	——— rufa.
Staphylinus latebricola, Grav. .	Myrmica rubra.
Quedius brevis, Eric.	Formica rufa.
Hetærius sesquicornis, Preyssl. .	——— fusca, and flava.
Dendrophilus punctatus, Ent. Hefte	——— rufa.
——— pygmæus, L. . .	——— rufa.
Saprinus piceus, Payk.	——— rufa.
Amphotis marginata, F. . . .	——— fuliginosa.
Cetonia aurata, L. (Larva) . .	——— rufa.
Clythra 4-punctata, L. (Larva) .	——— rufa.
Monotoma conicicollis, Aubé . .	——— rufa.
——— angusticollis, Gyll. .	——— rufa.

2, Alma Road, Upper Holloway,
November 8th, 1856.

LEPIDOPTERA.

New British Species in 1856.

(By the Editor.)

The past season has *generally* been unusually prolific for Lepidoptera. A few of our correspondents have indeed complained of the paucity of "moths at sugar;" hence, as we have no reason to suppose that those thus complaining were themselves to blame, we are actually led to believe, that, whilst in one locality Lepidoptera were abundant, in another they were very scarce. But though we think the season has been an unusually good one, it does not thereby follow that we have an extra crop of novelties. We have no new *Sphinx*, no new *Bombyx*, but one new *Noctua*, and no new *Geometra*. Were there no Micro-Lepidoptera, our list of novelties would indeed be a poor one, but, fortunately, in the Tineina the crop of new species is unusually large. This shows that there is yet a mine that will repay working, and we trust, when the Tortricina have been monographed, we shall find novelties there hardly less plentiful. Ten years ago "a new British moth of the family of the *Tineidæ*" was considered a most interesting topic; now *ten new species* hardly attract so much attention.

Much no doubt is yet to be done by learning what species

are likely to occur here, and looking for them in the haunts and among the plants which they frequent abroad. When this is done systematically, not in one locality only, but in several, we shall expect to have annually to record the addition of some five or six *Noctuæ* to our lists. *Leucania Vitellina* is added this year, but how much longer are we to wait for *Leucania L.-Album?* We are strongly disposed to fancy specimens of it must exist unknown in some of the 500 collections of *Lepidoptera* in the country.

The new British species I proceed to notice are as follows:—

Leucania Vitellina.
Nyctegretes Achatinella.
Tortrix latiorana.
Dicrorampha Tanaceti.
Tinea Merdella.
Depressaria Libanotidella.
Coleophora Genistæ.
" Inflatæ.
" Virgaureæ.
Coleophora Vitisella.
Laverna conturbatella.
" Raschkiella.
Elachista tæniatella.
Lithocolletis Torminella.
Nepticula luteella.
" Regiella.
" atricollis.

Leucania vitellina, Hübner.

This belongs to the same section of the genus *Leucania* as *Conigera*. The anterior wings are pale yellowish, the hind wings whitish; and we notice besides a great difference in the markings, as the inner line is hardly angulated, terminating on the middle of the inner margin, and the lower end of the reniform stigma is not white.

Referring to the table of *Leucania* at page 187 of the Manual of British Butterflies and Moths, this species would be placed in the same class with *Conigera*, B.; but would easily be recognized from that species by the characters above given.

Not having a good specimen before me, I reserve a full

description for another opportunity. Mr. Cooke's specimen reminds one of the pale variety of *Xanthia Cerago*, and Duponchel has placed *Vitellina* in the genus *Xanthia*, probably on account of this resemblance.

The larva feeds on grass, through the winter, changing to pupa in February, March or April; the perfect insect appears in August and September; it occurs in Southern and Central France; and in some years is much commoner than in others.

This species is added to our list from a specimen having been taken at Brighton, by Mr. Henry Cooke, who thus announced its capture in the "Substitute:" "The locality in which I obtained this species was certainly rather a strange one; it was in my own little garden in the centre of this town. I saw the insect on the wing, and, without suspecting it was anything uncommon, made more than one attempt to catch it with my net, but failed; it went into a dense plant of *Epilobium*, and I could not drive it out. In accordance with my nightly custom I placed honey on such posts and flower-sticks as were available, and in a few minutes I saw the moth re-appear, and after hovering about for a short time it went straight to the nearest honey-bait and settled quietly. I then saw it was a stranger, and lost no time in boxing it: a little chloroform finished the business, and the insect is now in my cabinet, and numbered amongst my treasures."

Nyctegretes Achatinella, Hübner.

Alis anticis rufo-griseis, lineis duabus valde convergentibus albis, strigulaque interjecta albida.

Exp. al. 9 lin.

Head, face, palpi and antennæ pale reddish-grey. Anterior wings *reddish grey*, shaded with reddish brown, *with two*

conspicuous oblique whitish transverse lines, one from the costa near the base to the middle of the inner margin, the other from the costa near the apex to the inner margin beyond the middle; nearly midway between these two lines is an elongate whitish spot on the disc; cilia reddish-grey. Posterior wings pale grey, with paler cilia.

Not nearly allied to any known species.

Two specimens were taken among *Echium* at Folkestone in July. One by Mr. Stevens, the other by Mr. Tompkins.

Zeller says of this species (Isis, 1848, p. 651), "It is widely spread, but, probably, on account of its nocturnal flight, little known. It frequents dry, weedy slopes, keeps quite quiet by day; and only appears on the wing in the evening, when it is easily captured."

The larva is unknown.

Tortrix latiorana, n. sp.

Alis anticis latiusculis dilute ochreis, fascia oblique brunnea obsoleta, macula costali pone medium vix distinctiore, punctis nigrescentibus marginem posticum versus nullis.

Exp. al. 8—10 lin.

Anterior wings pale-ochreous, with an indistinct oblique pale brown band from the costa before the middle, which can rarely be traced to the inner margin. Before the apex is a small costal blotch of a similar colour. *In many specimens both these markings are obliterated.* Posterior wings *white;* ciliæ whitish, *with a grey line at their origin in the* ♂.

The wings are shorter and more stumpy than in *Spectrana*, the markings rarely as distinct; the hind wings whiter, and the grey line in the fringe of the male furnishes a very distinctive character. The absence of the

two or three dark brown spots before the middle of the hind margin of the fore wings is also a noticeable distinction.

Taken by Mr. S. Stevens, in a salt marsh at Southend, in July.

It is surprising that the Linnæan *Gnomana*, another species nearly allied to *Spectrana*, has not yet occurred here. Herrich-Schäffer says of it, "abundant everywhere on hawthorn."

Dicrorampha Tanaceti, n. sp.

Alis anticis latiusculis griseo-olivaceis, striis transversis obsoletis pone medium plumbeis, macula magna triangulari dorsali dilutiore; alis posticis dilute griseis.

Exp. al. 6—6½ lin.

Head, face and palpi greyish-olive. Anterior wings rather broad, greyish-olive, with some faint transverse leaden markings beyond the middle; on the middle of the inner margin is a triangular blotch paler than the ground colour, which is sharply defined towards the base, but gradually shades off at its hinder edge. The form of this marking reminds one strongly of *D. Artemisiæ* and *D. Acuminatana*, and in the form of the wings the insect resembles *Artemisiæ*, but the ground colour is totally different. Cilia pale yellowish-olive, darker externally. Posterior wings pale grey, with pale greyish-ochreous cilia, thus much paler than in *Artemisiæ*.

Several specimens of this insect have been taken by Mr. Thompson of Crewe, among tansy. And I have a specimen from Scotland, which I have had by me several years.

It is of course rather hazardous to describe a new species of this group, but before doing so specimens of this insect were submitted to Professor Zeller for his opinion, and he could not find that they agreed with any known species.

TINEA MERDELLA, Zeller.

Alis anticis DILUTE *ochreo-griseis*, NITIDIS, *strigula abbreviata basali prope costam, maculis duabus ante medium maculaque majori pone medium nigrescentibus.*

Exp. al. 5—7½ lin.

Head and face greyish-ochreous (paler than in *Pellionella*). Palpi pale grey, the long bristles dark brown. Antennæ rather dark grey. Anterior wings pale greyish-ochreous (paler and more silky looking than in *Pellionella*), with a short blackish streak from the base near the costa; before the middle are two blackish spots, one in the fold, the other longer and rather anterior to it on the disc; beyond the middle is a larger spot; cilia unicolorous, very pale greyish-ochreous. Posterior wings whitish grey, with pale grey cilia.

Best distinguished from *Pellionella* by the paler, more silky ground colour of the anterior wings.

Discovered at Liverpool in a wool warehouse by Mr. N. Cooke, who thus announced the capture in the Intelligencer, p. 125: "On the 11th inst. and again to-day (July 14th), I have taken a number of specimens of this species in a wool warehouse; the room contains wool from Naples, Trieste, Peru and Australia, and they may have been imported from any of these places in the larva state; but who is to prove it? I believe they have bred in the room, and therefore claim a place in the British list for the species, as I think it has just as much right there as some other species taken in and about warehouses."

There can be little doubt that many omnivorous feeders stand much chance of being imported, and when once here of becoming naturalized.

Some of the *Œcophoræ*, *Ephestiæ* and *Tineæ* are species

extremely liable to be imported feeding on dried vegetable or animal matter, and it is precisely in these genera that several accidental additions to our collections from the metropolis and our outports have occurred.

DEPRESSARIA LIBANOTIDELLA, Schläger.

Alis anticis elongatis, fuscescentibus, costam versus rufescentibus, linea media dilute pulverulenta, margine postico nigro-punctato.

Exp. al. 10—11 lin.

Head and face reddish-ochreous; palpi reddish-ochreous, second joint greyish beneath, terminal joint with a dark grey ring before the tip. Antennæ reddish-brown, with numerous short black longitudinal streaks. Anterior wings reddish-brown (darkest at the base towards the inner margin); the costa at the base broadly reddish-ochreous, beyond the middle the costal portion of the wing gradually shades off into the darker ground colour; beyond the middle is a rather sharply angulated, but not very distinct pale fascia; and some whitish scales sometimes occur on the disc; hind margin spotted with dark brown; cilia pale reddish-brown. Posterior wings pale grey, whitish towards the base, the cilia pale greyish ochreous.

Most nearly allied to *Heracliana*, but the anterior wings are much narrower, redder, and, towards the inner margin, darker. In colour it more resembles *Albipunctella* and *Chærophylli;* but the paler costa and more sharply angulated pale fascia distinguishes it from them. From *Pimpinellæ* it is distinguished by the larger size and whiter hind wings.

A specimen, taken by Mr. Turner at Newhaven, was exhibited at the September meeting of the Entomological Society. The larva feeds on *Athamanta libanotis*, in July and August.

COLEOPHORA GENISTÆ, n. sp.

Alis anticis brunneo-ochreis, postice saturatioribus, costa POSTICE DILATATA, *linea tenuissima plicæ, dorsoque anguste niveis; antennis albis nigro-annulatis, articulo basali incrassato, vix penicillato, grisescente.*

Exp. al. $5\frac{1}{2}$—$6\frac{1}{2}$ lin.

Head whitish-ochreous, darkest in the middle. Face and palpi whitish. Antennæ white, annulated with black, the basal joint greyish-ochreous, slightly thickened, with a few projecting scales beneath (rather more than in *Discordella*). Anterior wings brownish-ochreous, darker towards the hind margin, the space between the fold and inner margin paler; the costa white, narrowly at first but more broadly beyond the middle and continued almost to the extreme apex (thus extending much further than in *Discordella*); in the fold is a slender white streak (just similar to that in *Discordella*); and the inner margin is narrowly white (the white scales going further towards the apex than in *Discordella*); cilia brownish at the apex, shading into greyish-ochreous; hind wings pale grey, with pale grey cilia.

Distinguished from *Discordella*, which it very closely resembles, by the longer costal streak being broader beyond the middle, the white scales along the inner margin reaching further towards the apex, and the apical portion of the wing thus contracted in width being darker in colour.

The larva of this species was discovered early in May, near Newcastle, by Mr. Wailes. It feeds on the *Genista anglica*, in the leaves of which it makes white blotches; the case is formed of little bits of leaves added alternately in front and behind, and is pale greyish-ochreous. Mr. Miller subsequently met with the larva at Wanstead, and Mr. Boyd found it at Lyndhurst in the New Forest. It appears to

be common, and at the same time widely distributed, though hitherto apparently completely overlooked.

COLEOPHORA INFLATÆ, n. sp.

Alis anticis albis, venis tenuibus ochreis, squamis nonnullis sparsis nigris; antennis albis.

Ep. al. $7\frac{1}{2}$—$8\frac{1}{2}$ lin.

Head, face and palpi whitish-ochreous. Antennæ white, unannulated. Anterior wings white, with slender, neat, ochreous veins, and with a few scattered black scales along the fold and on the disc. Cilia greyish-ochreous. Posterior wings grey, with greyish-ochreous cilia.

Perhaps most nearly allied to *Onosmella*, but distinguished by the broader, paler veining of the wings and the scattered black scales.

I took a specimen of this at Mickleham in July, 1855, but had not recognized it as a distinct species till Mr. Boyd bred it from larvæ, which fed on the capsules of the *Silene inflata*.

COLEOPHORA VIRGAUREÆ, n. sp.

Alis anticis angustulis albis, venis latiusculis BRUNNEO-*ochreis, squamis sparsis saturate fuscis; antennis albis (interdum grisescente-annulatis).*

Exp. al. $5\frac{1}{2}$—$6\frac{1}{2}$ lin.

Head pale grey. Face greyish-ochreous. Palpi whitish. Antennæ white, sometimes entirely so, without annulations; sometimes faintly annulated with pale grey (but not with the annulation so dark as in *Argentula*); basal joint grey, not tufted, but rather thicker than in *Argentula*. Anterior wings rather narrow, white, with the veins broadly brownish-ochreous (thus darker than in *Argentula*); in the intervening white spaces are a few scattered dark fuscous scales. The costa is narrowly white to the middle. Cilia on the costa

whitish-ochreous, on the hind margin pale grey. Posterior wings grey, with grey cilia.

Most readily distinguished from *Argentula* by the absence of the dark costal cilia beyond a whitish line just before the apex, the *narrower anterior wings*, and paler annulations of the antennæ.

Discovered by Herr Schmid at Frankfort on the Maine in the larva state. Herr Schmid having sent me some larvæ which feed on the seeds of the golden-rod (*Solidago virgaurea*), and I have recently returned from Bideford, where that plant abounded, it occurred to me that if I could get some observant collector in the West of England to search the *Solidago*, the new species might be found here. I wrote to Mr. Parfitt, of Exeter, who had already proved himself a useful correspondent, to examine carefully the seeds of the golden-rod for this insect; he did so, and immediately found it, and from the larvæ he sent me I bred the perfect insect in August rather freely.

The case is rather small and cylindrical, as most of the cases of seed-feeding larvæ are, but it has some of the loose filaments of the seed-down woven into it, and these are fast only at the anterior end, the hinder end being loose like the quills of a porcupine.

Frey appears to have had this species before him when he described his *Albicans*, but as it does not appear to be the *Albicans* of Zeller, who makes no mention of the narrowness of the anterior wings, that name cannot be retained for it. The *Albicans* of Herrich-Schäffer feeds on *Artemisia* in a bulb-like case.

Coleophora Vitisella, Gregson, n. sp.

This species, described by Mr. Gregson in the Zoologist, 1856, p. 5167, I have not yet had an opportunity of sufficiently examining. The female is yellower than the male, as

in *Viminetella*, *Gryphipennella*, *Siccifolia*, &c.: in the general dull glossy appearance and slenderness of the antennæ it reminds one much of *Viminetella*; but the case of the larva, not unlike a miniature case of *Anatipennella*, abundantly proves its distinctness.

The larva was found by Mr. Gregson, April the 16th, at the Brushes, near Manchester, on the *Vaccinium Vitis-Idæa*. Mr. Hague also met with it in the same locality (Intelligencer, p. 63). Professor Zeller found the larvæ near Glogau, in November, then feeding.

LAVERNA CONTURBATELLA, Hübner.

(Fig. 2.)

Alis anticis nigro-cæruleis fuscoque intermixtis, maculis duabus albis oppositis pone medium (macula costali majore ac posteriore); capite, thoraceque saturate griseis.

Exp. al. 7—8 lin.

Head and thorax dark grey. Face pale grey, with a few darker scales. Palpi pale grey; terminal joint with two black rings, one near the base, the other before the tip. Antennæ dark grey. Anterior wings blueish-black, with some rather indistinct tawny blotches; a greyish blotch at the base of the inner, and two conspicuous white spots towards the hind margin, that on the costa the broadest and most posteriorly placed; on the fold are three tufts of black scales and three others above them; cilia brownish, frequently with a few whitish scales. Hind wings greyish-brown, with paler cilia.

Distinguished from *Propinquella*, which it most nearly resembles, by its larger size, and dark head and thorax. In *Propinquella* the head, thorax and blotch at the base of the inner margin of anterior wings are conspicuously *white*.

This species was added to our list by Mr. F. O. Standish

and Mr. Machin, who met with it on the summit of Box Hill, amongst the *Epilobium angustifolium*, which grows in the wood there.

The larva is black, and spins together the terminal leaves of the *Epilobium*, much as *Halias Clorana* does the terminal leaves of willows. (See the observations of Mr. Machin and Mr. Standish, in "Intelligencer," pp. 132, 142).

Mr. Hodgkinson finds he has a specimen of this insect, which he took two or three years ago near Preston.

Laverna Raschkiella, Tischer.

(Fig. 3.)

Alis anticis fuscis, violaceo-suffusis, maculis duabus (una basali dorsum versis, altera disci) flavis, macula albida costali ante apicem.

Exp. al. 4—5 lin.

Head whitish, at the back dark grey. Face whitish. Palpi grey. Antennæ black, with a few pale annulations towards the tip. Anterior wings black, more or less blotched with orange; the orange generally assumes the form of two spots—one near the base, towards the inner margin, the other on the disc beyond the middle; nearly in the middle of the wing may be distinguished in certain lights three violet spots; and the hind margin is tinged with violet. Beyond the middle is a small whitish spot on the costa running into the second orange blotch. Cilia blackish. Posterior wings dark grey, with dark grey cilia.

Not nearly allied to any known species.

This species has also resulted from the explorations of Mr. Standish and Mr. Machin on the summit of Box Hill; they having met with it there on the 22nd of June (Intelligencer, pp. 101, 115). Towards the end of July they discovered the larva mining the leaves of *Epilobium angustifolium*, and in August the second brood of the perfect insect.

ELACHISTA TÆNIATELLA, Zeller, n. sp.

Alis anticis saturate fusco-nigris, postice dilutioribus et flavido-irroratis, fascia media recta latiuscula lutea; ciliis saturate griseis; capite saturate grisescente.

Exp. al. 4½ lin.

Head, face and palpi dark greyish-brown. Antennæ blackish, anterior wings dark brownish black at the base, the apical portion paler and irrorated with yellowish scales; nearly in the middle is a straight rather broad yellow fascia, sharply depressed on its edge, less so towards the apex; it expands a little towards the inner margin. Cilia dark grey, intersected by two darker lines. Posterior wings pale grey, with darker cilia.

The uniform dark colour of the cilia of the anterior wings, the uniform colour and breadth of the fascia, and the yellowish scales irrorated over the apical portion of the anterior wings, are characters by which this species may be at once distinguished from the other known one-banded species of the genus.

The larva which Mr. Scott found at Stockton-on-Tees feeds in the autumn, in November, in a rather coarse grass (probably *Arrhenatherum avenaceum*), in which it forms brownish mines, somewhat like those of *E. Megerlella*. The larva hybernates full fed, changing to a pupa in the spring. The perfect insect appears in April. This larva was also found by Herr Schmid at Frankfort on the Maine.

LITHOCOLLETIS TORMINELLA, Frey.

Alis anticis dilute croceis, linea basali alba costam versus tenuiter nigro-marginata, strigulis quatuor costæ, tribus dorsi introrsum nigro-marginatis; striola apicis nigra.

Exp. al. 3½ lin.

Head brownish saffron. Face and palpi white. Antennæ

white (rarely with any appearance of darker annulations). Hinder tarsi whitish, spotted with dark fuscous.

Anterior wings rather pale, but bright saffron yellow (darker than in *Spinicolella* and *Faginella*, paler than in *Pomifoliella*), with pure white (not silvery white or pearly white) markings; from the base arises a slender rather short basal streak, slightly edged with black towards the costa (this dark edge is sometimes wanting); on the costa are four white spots, and on the inner margin three; the first pair of spots are less obliquely placed than in *Sorbi*, are dark margined on both sides, and the dorsal spot is broader than is usually the case in *Pomifoliella*. The black scales towards the apex form a more distinct black line than in *Pomifoliella* or *Sorbi*. A black hinder-marginal line runs through the pale saffron cilia. Hind wings grey, with grey cilia.

Best distinguished by the colour of the fore wings, and almost snow-whiteness of the markings. In 1853, I bred a specimen which, having no dark margin to the basal streak, nor the first pair of spots dark margined towards the base, had a very striking appearance.

The larva mines the underside of the leaves of *Sorbus torminalis*, and is not uncommon on two or three bushes at Lewisham. My attention was directed to it in 1853 by Dr. Jordan, but it was reserved for Professor Frey to establish its specific distinctness.

Nepticula luteella, n. sp.

Alis anticis saturate olivaceis, postice violaceis, fascia pone medium recta flavida, costam sæpe non attingente; capillis flavidis, brunneo-mixtis.

Exp. al. $2\frac{1}{4}$ lin.

Head and face yellowish, more or less mixed with brown; palpi whitish; antennæ fuscous, basal joint whitish. An-

terior wings dark olive to beyond the middle; considerably beyond the middle is a nearly straight pale-yellowish fascia, broadest on the inner margin, and often not reaching to the costa; the apical portion of the wing is violet, the apical cilia pale yellowish; posterior wings grey, with paler cilia.

By the dull yellow non-metallic fascia, on the olive-coloured wings, this may be immediately distinguished from every other known species.

In June, 1852, I took several specimens of this on the Dartford Heath fence. This season Mr. Boyd has succeeded in rearing the species from one of the birch-mining larva—I believe from that larva which makes a long, not much contorted gallery, in which the black excrement forms merely a central line. Such a larva I have found at Lewisham, and not uncommonly at Mickleham, but never reared it.

Nepticula Regiella, Frey.

Alis anticis dilute aureo-brunneis, postice saturate purpureis cupreo-mixtis, fascia pone medium lata, orichalcea, obsoleta; capillis rufis.

Exp. $2\frac{1}{4}$ lin.

Head and face reddish-yellow; palpi whitish; antennæ fuscous, basal joint whitish. Anterior wings pale golden-brown, tinged with purple, a broad dull golden or brassy fascia, beyond the middle not sharply defined; immediately beyond the fascia are some coppery scales in the deep purple apical portion of the wing; cilia greyish, whitish at the tips. Posterior wings grey, with paler cilia.

Distinguished from all its allies by the indistinctly margined *brassy* fascia on the pale golden brown anterior wings.

I have a specimen taken on the Dartford Heath fence

in June, 1852. It remained undeterminable as a single queer specimen, till last winter Professer Frey sent me a Zurich specimen bred from a yellow hawthorn-feeding larva. Mr. Edleston, who has lately turned his attention to this genus, has been rewarded with "beginner's luck" in breeding a specimen of *N. Regiella* from mixed leaves.

NEPTICULA ATRICOLLIS, n. sp.

Alis anticis atris, fascia obliqua pone medium, in medio contracta, dorsum versus latiore, lutescenti-argentea.

Exp. al. $2\frac{1}{4}$—$2\frac{1}{2}$ lin.

Head and face reddish-yellow; palpi whitish; antennæ fuscous, basal joint white. Anterior wings deep black; a little beyond the middle is a yellowish-silvery fascia, rather obliquely placed, often attenuated in the middle, and the inner edge of the lower half expanding more or less towards the base; cilia of the hind margin whitish. Posterior wings grey, with grey cilia.

Very closely allied to *N. angulifasciella*, but smaller, the anterior wings narrower and blacker; the silver fascia more oblique, less curved, the portion of it touching the inner margin further from the base.

This species has been bred by Mr. Boyd from wild apple and hawthorn. I met with the larva in October, 1853, and each succeeding autumn, but never succeeded in rearing a specimen; it is readily recognized by the almost black colour of the head and second segment; the mine, at first a gallery, gradually expands into a blotch.

LEPIDOPTERA.

RARE BRITISH SPECIES CAPTURED IN 1856.

MANY of the more important of these have already appeared in the columns of the Entomologist's Weekly Intelligencer; in such cases a reference to the page will enable the curious in such matters to refer to that journal for any more detailed account than we have room for here.

VANESSA ANTIOPA; one in the Isle of Wight in the Spring (Int. 43).

ARGYNNIS LATHONIA; one near Chesham, Bucks, the middle of August (Int. 173).

THECLA BETULÆ; appears to have been commoner than usual: several were taken at Darenth (Int. 197); and as many as forty at Henfield, Sussex (Int. 198). Mr. Crotch also found it in abundance in the valley of the Dovey, between Machynleth and Cemmaes.

THECLA W.-ALBUM; bred by the Rev. Joseph Greene, who finds it not very uncommon among elms, at Playford.

PAMPHILA ACTÆON; has been taken in numbers at its own locality—the "Burning Cliff" (Int. 154); we have since learnt that another Entomologist visited the spot the previous day to Mr. Pretor's excursion thither.

ANTHROCERA MINOS; has been taken in abundance by Mr. Birchall (Int. 114), and Mr. Wright (Sub. 11).

ACHERONTIA ATROPOS; the larva has been unusually common this autumn; there are several notices of it in the Intelligencer.

SPHINX CONVOLVULI; the occurrence of five specimens

has been recorded, at Bristol, Barnstaple, Mortlake and Peckham (Int. 186, 187, 197, and Subs. 15).

DEILEPHILA GALII; two larvæ of this species were found near Brighton (Int. 203).

TROCHILIUM CHRYSIDIFORME; several specimens of this species were taken near Folkestone the middle of July (Int. 142 and 151).

TROCHILIUM SCOLIÆFORME; on our Plate, at figure 4, we give the promised representation of this insect. (See Ent. Ann. 1856, p. 27.)

CERURA BICUSPIS; Mr. Nixon bred a male of this species (Int. 62), and Mr. Scott has also bred a specimen. Mr. T. Wilkinson has obtained the larva this autumn.

DRYMONIA CHAONIA; twelve pupæ at the roots of trees in Suffolk.

DRYMONIA DODONÆA; upwards of 200 pupæ were obtained by digging in Suffolk by the Rev. Joseph Greene.

LOPHOPTERYX CUCULLINA; a specimen of this was taken in the perfect state at Marlow (Int. 155). Most of the recent specimens have been bred from the larvæ. The Rev. Joseph Greene took 54 larvæ at Tring.

LOPHOPTERYX CARMELITA; early in May several specimens of this were taken at West Wickham Wood (Int. 44 and 61).

PETASIA NUBECULOSA; several specimens of this insect were taken by Mr. Foxcroft at Rannoch (Int. 24, 45); at page 45 will be found rather a humorous account of the mode of capture.

PERIDEA TREPIDA; the captures of two specimens have been recorded (Int. 37 and 60), at West Wickham and Horndean, but some collectors hardly view the species now as a rarity.

ORGYIA GONOSTIGMA; a number of larvæ of this species

were collected near Wimbledon and Coombe Wood, and some collectors bred the insect rather freely (Int. 91 and 163).

LASIOCAMPA TRIFOLII; this has been a most abundant species in several coast localities, Eastbourne, Plymouth, New Brighton (Int. 45, 52, 77, 91, 116, 131).

GASTROPACHA ILICIFOLIA; the occurrence of five specimens at Cannoch Chase is recorded in the Intelligencer at page 67.

ENDROMIS VERSICOLORA; six specimens were seen at Tilgate Forest last April (Int. 26), and one in a wood near Preston (Int. 28).

DREPANA SICULA; two specimens of this hitherto unique insect occurred in Leigh Wood, near Bristol (Int. 108, and Zoologist, 5166).

HETEROGENEA ASELLUS; in the New Forest this insect *turned up* in some plenty, and two specimens were taken at Marlow (Int. 171, 189).

CYMATOPHORA OCULARIS; the Rev. Joseph Greene obtained seven pupæ of this scarce species.

DIPHTERA ORION; has occurred in the Isle of Wight, and in the New Forest; in the latter locality in some numbers (Int. 83, 172); also in Cornwall (Int. 108).

ACRONYCTA ALNI; one at sugar near Witney (Int. 109), two near Sheffield (Int. 109), and two larvæ at Rugby (Int. 180).

ACRONYCTA AURICOMA; occurred at Tenterden (Int. 83), and near Canterbury.

SYNIA MUSCULOSA; two specimens have occurred at Brighton (Int. 154, 173).

XYLOMYGES CONSPICILLARIS; has been taken near Worcester (Int. 20 and 83); also at Darenth Wood (Int. 51 and 76).

LAPHYGMA EXIGUA (Fig. 6); specimens of this insect

have been taken by Mr. Henry Cooke at Worthing (Int. 173), and Mr. Wallace in the Isle of Wight (Int. 183). Mr. Wallace's specimen, a female, kindly laid some eggs, the larvæ from which having fed up duly changed to pupæ, and three specimens of the perfect insect have already made their appearance.

HELIOPHOBUS HISPIDA; a specimen was taken near Plymouth in September, by Mr. Rogers.

MAMESTRA ABJECTA; two specimens were taken at Holywell by Mr. Archer, one at sugar, the other at light.

MIANA EXPOLITA; has again occurred near Darlington (Int. 139).

AGROTIS SAUCIA; unusually common this autumn; no less than fifty specimens were taken in the Isle of Wight, by one collector: it has also occurred freely at Deal, and has been taken at Plymouth and other places on the south coast.

AGROTIS LUNIGERA; this has been no great rarity in the Isle of Wight, at sugar.

AGROTIS OBELISCA; several have been taken at sugar in the Isle of Wight.

AGROTIS ASHWORTHII; has been taken rather freely in North Wales (Int. 125).

NOCTUA DITRAPEZIUM; six very fine specimens were taken by Mr. Bond, near Blandford, in July.

TÆNIOCAMPA LEUCOGRAPHA; occurred near Marlow in April (Int. 12), also at Darenth Wood (Int. 11) and East Grinstead (Int. 28).

DASYCAMPA RUBIGINEA; a few hybernated specimens were taken at Exeter and Plymouth, in April (Int. 11, 15); in the autumn a specimen occurred at Marlow.

CIRRÆDIA XERAMPELINA; at the end of August, the Rev. Joseph Greene obtained forty-six pupæ at the roots of ash trees.

CRYMODES TEMPLI; four have been taken on gaslights at Plymouth. In 1823, this insect was taken in Devonshire by Captain Blomer.

CUCULLIA GNAPHALII; Mr. Hawker has met with the larva of this rare species at Horndean (Int. 155).

CUCULLIA CHAMOMILLÆ; has been taken at Dunbar and at Plymouth not uncommonly (Int. 61, 142).

HELIOTHIS ARMIGERA; a specimen of this rare *Noctua* was taken about the middle of August by Mr. Parfitt, at Exeter; one was also taken by Mr. Dutton in the Isle of Wight (Int. 183).

ENNOMOS ILLUSTRARIA; appears now to have become almost a common insect (Int. 26, 36, 44, 62, 76, 115, 142).

ENNOMOS ALNIARIA; a third British specimen has been taken at Margate (Int. 13).

MACARIA NOTATARIA; this species appears to have been commoner than usual, though the supply of wings seems to have been deficient, many having only three (Int. 76, 124, 132, 151, 163).

EUPISTERIA CARBONARIA; was taken on Engleborough in Lancashire by Mr. Gregson (Int. 44); all the previous captures were from Scotland.

SPERANZA CONSPICUARIA; has occurred at Stowmarket but less plentifully than usual (Int. 67).

COREMIA LIGUSTRARIA; very common in hawthorn hedges at Playford, near Ipswich.

PHIBALAPTERYX GEMMARIA; the capture of a specimen of this insect, in the Isle of Wight, fell to the lot of Mr. Wallace (Int. 187).

EUCOSMIA UNDULARIA; a specimen was taken by the Rev. Mr. Horton in Cornwall (Int. 108).

CABERA ROTUNDARIA; a fine series of this species has been bred by Mr. F. O. Standish (Int. 142).

ALEUCIS PICTARIA; was taken on the Dartford Heath fence as usual (Int. 11, 43, 46).

EUPITHECIA SUCCENTURIATA; has been taken and bred in some numbers by the Lancashire and Scotch collectors; there seems now no longer room to doubt but that *Subfulvata*, *succenturiata* and *cognata* are varieties of one species.

EUPITHECIA CONSIGNATA; a specimen was taken in Suffolk this spring (Int. 43).

ACIDALIA PEROCHRARIA; was taken by Mr. Harding, at Deal (Int. 109).

ACIDALIA INORNARIA; Mr. Bond met with several specimens of this near Blandford.

RHODARIA SANGUINALIS; this still continues to be taken on the Cheshire sand hills (Int. 99).

ODONTIA DENTALIS; has occurred again rather freely at Brighton (Int. 116, 134).

PIONEA STRAMENTALIS; this has again been plentiful at Shrawley Wood, near Worcester, and has also been taken at Pembury, by Mr. Weir (Int. 124).

SPILODES PALEALIS; a specimen of this insect was taken by Mr. Hunter, at Folkestone, in July (Int. 142).

SPILODES SILACEALIS; three specimens were taken by Mr. Wallace, on Culver Cliffs, Sandown, Isle of Wight.

BOTYS TERREALIS; has again been taken rather freely in North Wales (Int. 115), and has likewise been bred by Mr. Almond (Int. 133).

BOTYS DECREPITALIS; has again been taken by Mr. Buxton, in Ross-shire (Int. 100).

BOTYS LANCEALIS; taken by the Rev. Mr. Hawker (Int. 107), and by Mr. Harding (Int. 116), and by Mr. Weir (Int. 124).

EPISCHNIA DIVERSALIS; a specimen, taken by Mr. Hut-

ton at Hurstperpoint, was exhibited at the April meeting of the Entomological Society (Int. 7).

SIMAETHIS SCINTILLULALIS: this insect has been bred by Mr. Vaughan, and has also been taken plentifully at Preston, by Mr. Hodgkinson (Int. 166).

AMPHYSA PRODROMANA; this occurred rather freely in April, at the Brushes, near Manchester (Int. 27).

ŒNECTRA PILLERIANA: Mr. Buxton has obtained a fine series of this insect from the Isle of Wight.

SPILONOTA PAUPERANA; this has again been taken in April, in lanes, near Darenth Wood.

SPILONOTA NEGLECTANA; this insect, which is much overlooked or *neglected*, has been taken freely near Camberwell, by Mr. Wildman (Int. 61).

MIXODIA HAWKERANA (Fig. 5); this has again been taken by Mr. Bond.

PHOXOPTERYX UPUPANA; a specimen was taken at West Wickham by Mr. Wildman (Int. 83), at the end of May, and Mr. Machin also met with this insect in the same locality, early in June (Int. 90).

PHLÆODES CRENANA; several specimens of this insect were taken by Mr. Wilkinson of Scarborough, who writes—"I took them in March and April last on Seamer Moor, two miles west of this place; they were freely on the wing in fine sunny mornings from ten to one amongst heather, stunted oaks, birches, sallows, nut bushes and furze bushes; they seemed to frequent the sallows the most." Madame Lienig says (Isis, 1846, p. 236), "it flies fresh in April, July and September. The larva is whitish or pale green, the head pale brown; it feeds on sallows and willows; the perfect insect in the day time is generally found sitting on walls."

HEUSIMENE FIMBRIANA; this has been taken in some

plenty in the neighbourhood of Manchester (Int. 17, 28); it also occurred at Darenth Wood (Int. 26).

RETINIA SYLVESTRANA; this species has been bred in some numbers by Mr. Machin and Mr. F. O. Standish, from the young shoots of the stone pine (*Pinus pinea*) (Int. 133, 142).

ARGYROLEPIA MARITIMANA; Mr. Harding has again taken this insect at Deal (Int. 91); M. Guenée doubts this being identical with his *Maritimana*, and believes there are several allied species attached to the *Eryngium*.

OBSERVATIONS ON BRITISH TINEINA.

(Supplementary to the Insecta Britannica—Lepidoptera, Tineina; and the Entomologist's Companion, 2nd Edition.)

Exapate gelatella, I. B., p. 12. Mr. T. Wilkinson met the larva of this species between united leaves of willow in July, 1850, near Bristol.

Tinea rusticella, I. B., p. 27. "The larva," writes Mr. T. Wilkinson, "feeds on old carpet as well as rotten wood. In a cellar I found a piece of half-rotten carpet, on which a great many moths were sitting, some of them just in the act of drying their wings, and scores of empty pupa-cases protruding from the old carpet."

Tinea fulvimitrella, I. B., p. 27. Mr. Edleston says of this, "the larva feeds under the dead bark of beech and oak, round the hole where the 'frass' comes out."

Tinea corticella, I. B., p. 30. Mr. Edleston finds the larva of this species under the bark in dead oaks, and also in the rotten wood when the bark is taken off.

Tinea Caprimulgella, I. B., p. 32. Of this rare species Mr. Tompkins met with a specimen on an oak tree in Hyde Park, at the end of June (Int. 156).

Tinea misella, I. B., p. 33. Of this Mr. C. S. Gregson writes, "I have bred it from unthrashed wheat this year; it made up in the head and fed upon the grain. I formerly bred it from the interior of bean stalks, for seeing the pupa-

cases projecting from the stalks, I split up several stems and so found the larva."

Tinea pallescentella, I. B., p. 34. This has occurred in some plenty at Liverpool; the larva is granivorous. I give here a more complete description than I was formerly able to give.

Exp. al. 7—10 lin.

Head greyish-ochreous, with a few brown hairs in the centre. Anterior wings shining, pale greyish-ochreous, with a conspicuous blackish streak along the fold, reaching to the middle (sometimes interrupted near the base); on the disc beyond the middle are two blackish spots, surrounded, or at least followed by some paler ochreous scales; hind margin more or less spotted with dark fuscous; cilia pale greyish-ochreous. Posterior wings whitish grey, with whitish ochreous cilia.

Tinea semifulvella, I. B., p. 35. Mr. Gregson has bred this from birds' nests.

Tinea bistrigella, I. B., p. 35. This insect has been bred by Mr. Logan, and is the solution of Enigma No. 21 (Ent. Annual, 1856, p. 63). The discovery of the habit of the larva of this species by Mr. Boyd is one of the most important additions to our knowledge we have lately had to chronicle. The larva mines the leaves of the birch in July and August, at first in excessively slender galleries, which almost invariably commence near the tip of the leaf, run nearly parallel to and very near the mid rib to the base of the leaf, then turn off to one side, where at length the larva commences making a large blotch, in which it eventually cuts out an elliptical case, and descends to the ground, but does not eat any more. The perfect insect appears the following May or June (Int. 110, 125).

Lamprosetia Verhuellella, I. B., p. 39. I have received the larva of this species from Mr. Drane, who found it on

the ruins of Caerphilly, and from Mr. Bostock, who found it at Bideford (Int. 7). The perfect insect was met with in Wales by Mr. Gregson (Int. 115).

Micropteryx Allionella, I. B., p. 43. Mr. Edleston says he has seen many hundred specimens invariably among *Vaccinium Myrtillus*, flying over and sitting on that plant.

Micropteryx unimaculella, I. B., p. 45. Mr. Gregson bred this species from green pupæ found in small mines in the lichen and bark of birches (Int. 28, 29). This indication of where the pupæ should be looked for may lead to the detection of the larva.

Scythropia Cratægella, I. B., p. 57. I met with a nest of this species in June. The pupa is suspended quite exposed in the common web, and is unusually angular.

Hyponomeuta vigintipunctatus, I. B., p. 59. Two or three specimens of the perfect insect were taken at Guildford by the Rev. P. H. Newnham (Int. 67, 174), and in October he found two broods of the larva on the orpine (*Sedum Telephium*).

Anesychia funerella, I. B., p. 63. I have long suspected from its habitats this must feed upon the Comfrey (*Symphytum officinale*), and I have lately heard from Professor Frey, that, in the continuation of Sepp's work, the larva is figured on that plant. Professor Frey found it near Zurich on *Lithospersmum officinale*, along with the larva of *A. decemguttella*.

Plutella annulatella, I. B., p. 68. Mr. Wailes has met with this near Newcastle, and Mr. Wilkinson near Scarborough (Int. 174, 187).

Cerostoma horridella, I. B., p. 72. Herr Bremi, of Zurich, has found the larva on apple-trees.

Semioscopis Steinkellneriana, I. B., p. 79. Mr. Harding observes (Int. 26), that this flies from daybreak to sunrise.

Depressaria arenella, I. B., p. 87. I fancy this larva feeds on many of the Compositæ; Mr. Harding found it at Deal on burdock (*Arctium Lappa*), and I have seen leaves of *Serratula tinctoria* apparently operated on by this insect.

Depressaria purpurea, I. B., p. 89. Professor Frey informs us that the larva of this species has been found by Herr Bremi on *Torilis Anthriscus*.

Depressaria Pimpinellæ, I. B., p. 95. This has been taken in Dorsetshire by Mr. Tompkins, and near Plymouth by Mr. Reading, by beating thatch.

Depressaria nervosa, I. B., p. 98. Mr. Tompkins has obtained, from thatch in Dorsetshire, some very dark specimens (almost black) of this insect; *if* indeed they be strictly referable to it.

Gelechia terrella, I. B., p. 113. Mr. Scott has had this out in a breeding-cage, in which he had a bunch of rushes, so *supposes* the larva lived in the moss around the roots (Int. 147).

Gelechia Viscariella, Logan (E. A. 1855, p. 43; 2nd edit., p. 65; 1st Annual Supp. to I. B., p. 2). Mr. Wilkinson has bred what is probably this species from larvæ found in the shoots of *Lychnis dioica*, near Scarborough.

Gelechia tæniolella, I. B., p. 132. I have now bred this from a greenish-yellow and red-banded larva feeding between united leaves of *Lotus corniculatus*. I found it at Mickleham, the middle of June.

Gelechia Sircomella, I. B., p. 132. Mr. Wilkinson has taken this, in company with *G. tæniolella*, flying over clover; Mr. Thompson has also met with it at Crewe.

Gelechia nigricostella, I. B., p. 135. I have bred this from a pale green larva, with small black spots, feeding on *Medicago sativa*, which I received from Herr Schmid (Int. 45).

Gelechia paupella, I. B., p. 138. Mr. Douglas has bred several specimens *apparently* of this species from larvæ found in the flowers of *Inula dysenterica* (Int. 172). It becomes a question for future solution, whether *Paupella* be not the summer brood of *Inopella*.

Cleodora striatella (E. A. 1856, p. 36). A second specimen of this insect has occurred; it was taken by Mr. Cooke near Brighton.

Anarsia Spartiella, I. B., p. 144. I have bred this from brown larvæ in the shoots of furze, sent me by Mr. Boyd.

Hypercallia Christiernana, I. B., p. 153. The discovery of the larva on the leaves of *Polygala Chamæbuxus* by Professor Frey is recorded in the Intelligencer, p. 100.

Röslerstammia Erxlebella, I. B., p. 172. Some years ago Mr. T. Wilkinson found this in plenty at the end of May and beginning of June, in Leigh Wood near Bristol, on the leaves of some *lime* trees; frequently *in copulâ* on the leaves, also freely on the wing. Mr. Wilkinson is inclined to think there is a second brood towards the end of August and beginning of September, but not nearly so numerous as in May, and rarely met with except by beating.

Mr. Weir suggests we have two species mixed under this name, one feeding on heath and the other on lime.

Douglasia Ocnerostomella, I. B., p. 180. The following extract from a note from Mr. Winter affords a clue to the natural history of this species: "Some months since"—this was written in July,—"my friend Mr. Mitton of Hurstperpoint told me that he had discovered some minute larvæ *in the dead stems* of *Echium vulgare*, and that he had bred from them some small moths, which I felt no doubt were *D. Ocnerostomella*. I therefore collected some stems, but searched in vain for the larvæ. I kept them, however, in a glass jar, and several specimens of *Ocnerostomella* have just

made their appearance. I may mention, that I obtained several *case-bearing* larvæ from the same stems, but they all died."

Argyresthia glaucinella, I. B., p. 185. "The larvæ of this species," writes Mr. Edleston in the Intelligencer, "feed under the bark of oak and Spanish chesnut; they are excessively local, and only found at the base of trees of enormous size."

Cedestis farinatella, I. B., p. 190. Mr. T. Wilkinson met with the larvæ of this in March mining the leaves of *Pinus sylvestris*. The larva is shining pale brown, with dull green dorsal vessel. It mines from the tip of the leaf downwards, leaving the mined portion full of excrement.

Ocnerostoma piniariella, I. B., p. 191. The larva of this is brown, and it mines the leaves of *Pinus sylvestris* in March, working from the tip downwards; but though it leaves the end of the leaf full of excrement, some distance from the tip it makes a hole, and ejects its excrement through it, so that the lower half of the mine is tolerably empty and appears whitish.

Zelleria hepariella, I. B., p. 192. Mr. Wilkinson says, "I first met with this by beating *yew* trees in September." Mr. Gregson met with it in a *yew* wood near Conway (*Gracilaria Haighii*, Zoologist, 5295); and I have myself seen it beaten from a *yew* tree at Mickleham.

Gracilaria semifascia, I. B., p. 196. Mr. Ashworth has bred this species from larvæ making cones on the leaves of *maple*.

Gracilaria omissella, I. B., p. 198. I found the larvæ of this species abundant at Reigate in September; Mr. Winter also met with it at Brighton.

Ornix Loganella, I. B., p. 207. Mr. T. Wilkinson has

bred this species at Scarborough from mountain-ash (Int. 7).

Coleophora Wockeella, I. B., p. 212. Mr. Bond met with several larvæ in a little wood near Canterbury in April, on *Betonica officinalis* (Int. 46).

Coleophora murinipennella, I. B., p. 218. At two separate times has Mr. Scott sent me a peculiar vandyked case; on one occasion it was on the seeds of *Luzula*. My last letter from Professor Zeller contained the gratifying information that "the larva of *C. murinipennella* feeds on the seeds of *Luzula pilosa;* next year I can send it you."

Coleophora conspicuella, I. B., p. 213. Three or four specimens of this were taken in Headley Lane this summer by Mr. Machin, Mr. Standish, Mr. Tompkins.

Coleophora orbitella, J. B. p. 221. Mr. Edleston has two specimens of this species, beat from a birch, June 29th, near Bowden, Cheshire; and Mr. Ashworth has bred it from a case found on the trunk of a birch tree.

Chauliodus Illigerellus, I. B., p. 234. Mr. Drane found the leaves of the *Œgopodium podagraria* "crumpled" by the larvæ in a wood near Cardiff. He was too late for the larvæ; he sent me a solitary one, from which I bred an Ichneumon.

Laverna propinquella, I. B., p. 236. Mr. T. Wilkinson writes, "I have bred a number of this either from *Epilobium hirsutum* or *alsinifolium*, but how it mined I cannot say at present. The perfect insect is now (July 28) very common on the flowers of ragwort."

Laverna ochraceella, I. B., p. 238. The larva mines the stems of the *Epilobium hirsutum*. Mr. T. Wilkinson says "it begins to mine from the root of the plant in the spring, as soon as the plant begins to shoot. I first found the larvæ the second week in May last, then very young."

Chrysoclista bimaculella, I. B., p. 242. A specimen was taken by F. O. Standish in 1855, on Leith Hill, among sallows.

Asychna terminella, I. B., p. 246. This has now been bred from the larva making spiral mines in the leaves of *Circæa lutetiana* (Int. 94, 101).

How extraordinary that we should be acquainted with the larva of this rarity, before we know that of the common *Asychna modestella!*

Elachista Pfeifferella, I. B., p. 250. The larva makes blotches in the leaves of dogwood, similar to that of *E. Treitschkiella*, but, as might be expected, the larva and blotch are both larger; besides the head and second segment are *pale brown* in *Pfeifferella*, black in *Treitschkiella;* the latter has also a row of black spots beneath, which are wanting in *Pfeifferella*.

The case is perhaps a trifle larger.

Elachista consortella, I. B., p. 256. This pretty species is not uncommon in Headley Lane in June, but very lively and not easily boxed.

Elachista Bedellella, I. B., p. 257. The larva mines in March and April the tips of the leaves of *Avena pratensis;* the upper cuticle becomes conspicuously whitish, the tip itself dull pink. It is common on Box Hill.

Elachista adscitella, I. B., p. 259. Of this *E. abruptella* I. B., p. 258, is the female. The larva discovered by Mr. Scott, near Stockton, mines the leaves of *Sesleria cærulea*, making very white mines.

Elachista pollinariella, I. B., 261. This has been bred by Mr. T. Wilkinson, but the larva was not distinguished at the time.

Elachista ochreella, I. B., p. 262. Mr. Machin met with this at West Wickham, Mr. Weir at Pembury and Mr.

Hodgkinson at Preston (Int. 91, 99 and 101). Hence it seems widely distributed.

Elachista cygnipennella, I. B., p. 263. As an instance of the difficulties of the Entomological student, I may observe that Mr. Scott sent me this larva mining in six different grasses, and *E. albifrontella* was mining in the same six grasses at the same time.

Lithocolletis hortella, I. B., p. 267. Several have been taken by Rev. P. H. Newnham at Guildford.

Lithocolletis Amyotella, I. B., p. 267. Mr. T. Wilkinson bred this freely from oak leaves.

Lithocolletis quinqueguttella, I. B., p. 268. Mr. Gregson has bred this from sallow-feeding larvæ, which he collected last autumn from the small sallows on the sand hills.

Lithocolletis irradiella, I. B., p. 269. Mr. T. Wilkinson has bred several of this species.

Bucculatrix cidarella, I. B., p. 291. Among alders this seems generally abundant. Mr. T. Wilkinson has taken it freely at Scarborough; and at Reigate I found the marks where the larvæ had been (for I was too late for them) very plentiful.

Bucculatrix Demaryella, I. B., p. 292. Mr. T. Wilkinson discovered the larva of this feeding on birch (Int. 171).

Bucculatrix maritima, I. B., p. 293. Mr. Hemmings has discovered the larva of this species feeding in May on *Aster tripolium*.

Bucculatrix Hippocastanella, I. B., p. 294. Mr. Ashworth met with the larva of this species on a lime tree at Llangollen (Int. 172).

Nepticula Headleyella, I. B., p. 300. Mr. Tompkins took a specimen of this in Headley Lane, June 8th; and I met with two there on the 23rd June.

Nepticula cryptella, Ent. Ann. 1856, p. 41. This is

the solution of Enigma No. 16. I took two specimens in Headley Lane, June 23rd; and the middle of July I found the Lotus-mining larvæ freely; none of these have yet produced moths; yet as Frey gives September and October as the time for the larvæ, there ought to be an August brood of the imago.

Nepticula argentipedella, I. B., p. 303. This is the solution of Enigma No. 10, I having bred two specimens from the birch leaves sent me last autumn by Mr. Wilkinson.

Nepticula Alnetella, Ent. Ann. 1856, p. 43. I found the larvæ of this not uncommon on Reigate Heath in September, and plentiful near Beckenham in October.

It has been suggested to me that there are two species of *Nepticula* mining in alder leaves.

ANSWERS TO ENIGMAS.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL, 1855, 1st Edition, p. 63; 2nd Edition, p. 85.

1. *Asychna terminella*; see ante, p. 128. Last year we indicated as the *probable* solution of this enigma *Anybia langiella*.

5. *Nepticula arcuata*, Frey. This has not yet been bred in this country, though the larva has again been met with. The perfect insect is allied to *Angulifasciella*.

6. *Phoxopteryx Lundana*. This has been bred both by Herr Schmid and myself.

7. Not yet solved.

8. *Nepticula atricollis*; see ante, p. 112.

10. *Nepticula argentipedella*; see ante, p. 130.

11. Not yet solved.

16. *Nepticula cryptella*; see ante, p. 129. This had been bred by Professor Frey; I have not been equally fortunate.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL, 1856, p. 63.

18. Not yet solved.

19. *Coleophora Inflatæ*; see ante, p. 105.

20. Not yet solved.

21. *Tinea bistrigella*; see ante, p. 122.

22. Not yet solved.

23. *Elachista tæniatella*; see ante, p. 109.

24. *Coleophora Virgaureæ*; see ante, p. 105.

ENIGMAS STILL UNANSWERED.

7. "A *Gelechia?* larva on oak, forming an entire leaf into a vaulted chamber." Is not this *Phoxopteryx subuncana?*

11. "An *Elachista* larva, found by Mr. Scott at the end of April, mining in leaves of *Scirpus lacustris*." This has not again been met with.

18. "A *Lithocolletis* larva mining the upper side of birch leaves." This has not again been met with.

20. "A *Depressaria* larva found by Mr. Boyd, May 2nd, 1855 (it was then young), feeding on a leaf of parsnip (*Pastinaca sativa*) under a turned-down corner; this was expected to be *Depressaria Douglasella*." It has not again been met with.

22. "A singular mine on alder leaves." These I have collected rather freely this year, so hope to solve the difficulty next season. The habit of this larva is so very peculiar that it deserves special notice. The larva commences to mine near the midrib, and mines *along* a lateral rib for a short distance; it then crosses over from one lateral rib to another, and in so doing makes a very slight but visible track. This is the track to be looked for when collecting the larva; for, as soon as it reaches the next lateral rib, it mines along it to the midrib, and then mines down the midrib for an inch or more, all which time the larva and track are both completely concealed in the thickness of the rib; the larva then turns round and mines up the midrib to about the place

where it had entered it; there it quits the shelter of the rib, and makes a broad flat mine in the leaf, and, as soon as this mine is big enough, it cuts out an oval case like *Tinea bistrigella*, and descends to the ground. But in the alder feeder the blotch, being so much smaller, is all or nearly all used up to form the case; so that in the deserted leaves we see the hole, and the track between the two lateral ribs, but nothing more. If there is no hole, but yet this tell-tale track, the larva, though completely invisible, is still within the leaf!

NEW ENIGMAS FOR SOLUTION.

25. A *Nepticula* larva mining the leaves of *Vaccinium Myrtillus* in October and November. The mine is rather broad and considerably contorted. The larva when full fed quits the leaf. I first received this from Herr Schmid of Frankfort, and a few weeks afterwards Mr. Edleston sent it me from the neighbourhood of Manchester.

26. A *Nepticula* larva mining the leaves of birch; the mine has some resemblance to that of *Nep. luteella*, but the central track of excrement is broader, not so mathematically linear. "Mine contorted, at first nearly filled up with black excrement, then with a broadish central track of dark green excrement, leaving a whitish margin on each side."

27. A *Gelechia?* larva feeding in the heads of yarrow (*Achillea millefolium*) among the seeds. I met with this

some years ago in Devonshire, and last year Mr. Parfitt found it; this autumn it was sent me from Reigate by Mr. Jeffrey.

28. A *Coleophora* larva with a case similar to that of *limosipennella*, feeding on birch. I have found this at Lewisham, and have also received it from Mr. Tress Beale at Tenterden, and Mr. Weir at Pembury.

29. A *Coleophora* larva with a case similar to that o *siccifolia*, feeding on birch. This I also received from Mr. Tress Beale at Tenterden.

THE FOLLOWING HAVE NOT YET BEEN FOUND IN THIS COUNTRY, BUT ARE STILL UNSOLVED PROBLEMS IN NATURAL SCIENCE.

30. An *Adela ?* larva in a flattish case formed of pieces successively added at one end. These were found by Herr Schmid at Frankfort, in March and April, and fed indifferently on sloe, chickweed, or almost any thing green. They climbed up the twigs of sloe I gave them, without difficulty, and nibbled off the just expanding buds. "Can an oyster climb a tree?"

31. A *Coleophora* larva feeding on *Vaccinium Myrtillus* in a longish slender case *somewhat* like that of *Viminetella*, found by Herr Schmid at Frankfort, the middle of October. I believe I found one of the same kind in May, 1855, in the Stadtwald at Glogau; hence the feeding larvæ may be sought for and collected next spring.

32. A *Coleophora* larva found by Herr Mühlig feeding on the seeds of *Artemisia vulgaris* at the end of September; the case shaped like a withered flower.

HOW INSECTS BREATHE.

By John Lubbock, F.G.S.

Few people could describe with accuracy the internal anatomy of insects. We all know that they eat, run, and see, and that many of them fly; but how they perform these actions few even among Entomologists care to know. And yet this indifference cannot be ascribed to the nature of the subject itself; for though the inner organs cannot for an instant vie in brilliancy of colour with those that are more exposed to the light, they will be found noways inferior in beauty of form, in delicacy of structure, or in the lessons which they teach us of the power and goodness of the Creator. The absence of all disagreeable smells and of red blood, as well as the few instruments that are necessary (for a small microscope, a trough of water for the object, a pair of fine scissors and some needles stuck in handles are quite sufficient), make insects very favourable subjects for those who wish to examine that most wonderful of all machines—an animal. We must indeed expect that collecting, and the pleasant walks in the country which it involves, when not an hour passes without some tangible result, will always be more popular than the sedentary studies of the anatomist; but the great disproportion which appears to exist at present between these two classes of Entomologists, cannot be in this way entirely accounted

for. It is probably in part owing to the want of popular works on anatomy. At present the young Entomologist, who wished to know something more about the structure of the insects which he collects, than their outer form and colours, would probably, unless some one was near to inform him, have great difficulty in obtaining any suitable book; and if, without profiting by the experience of his predecessors and trusting boldly to his own exertions, he endeavoured to solve the question for himself, he would, when he had removed the skin of any insect he might choose as most suitable for his purpose, find before him an intricate and apparently confused labyrinth of nerves, tubes and vessels—a sort of Gordian knot, more easy, alas, to cut and spoil, than to unravel; a little microcosm, showing, as has been said of our earth itself—"no trace of a beginning, no sign of an end."

If, however, the insect be fresh, one set of tubes, distinguished by a silvery white colour, will be seen running over and among the other organs, like the roots of a tree in the earth; these are the tracheæ or air tubes, part of the breathing organs, of which it is my object here to give a short account. I shall not attempt to describe these organs in detail, but shall only notice them very briefly, and then point out some of the chief differences, and especially such as bear reference to the habits of the insect. For convenience of description we may divide the respiratory organs of insects into two parts, the spiracles or breathing holes, and the tracheæ or air tubes.*

The body of an insect consists of thirteen rings. The first forms the head; the next three are called the prothorax,

* The most complete account hitherto given of these organs is in Burmeister's Handbook of Entomology, which was translated by Shuckard in 1836, and in which will be found references to the earlier works on the subject.

mesothorax and metathorax; they carry the three pairs of legs, and, in the case of the two latter, also the wings, and are in the perfect insect more or less intimately connected together, forming a sort of strong box called the thorax. The remaining nine rings form the abdomen, but are very seldom all of them developed.

The normal situation of the spiracles is on the membrane connecting together each pair of segments, except the first and last. There are, therefore, never more, and very often less, than ten pairs, depending on the number of developed abdominal segments.

In a great many cases, however, the spiracles are situated not on the connecting membrane but on the segments themselves. In the silk worm, for instance, or the large caterpillar of the Goat moth, in which the spiracles can be seen as a row of nine dots on each side of the body, the spiracles which, according to the above rule, should be between the pro and mesothorax, are on the prothorax, while those which we should expect to find between the metathorax and first abdominal segment are carried back to the first abdominal segment and so on with the posterior spiracles. We cannot, however, at present account for these slight variations of position, and this is not the place to describe them in detail.

In the human throat there is a contrivance by which foreign substances are prevented from passing down the windpipe into the lungs; it is simply that the windpipe is smaller during expiration than in inspiration, the current of air rushes out with greater velocity than it entered, and of course carries out with it anything that may have got in accidentally:* in insects there is no such contrivance. The reason of this difference is obvious. Suppose in man, for instance, we had a complicated apparatus to prevent any of the food from entering the windpipe, but no means for

* Sir C. Bell, Phil. Trans. 1832.

removing it when once there; it could hardly fail, in the lapse of time, that something would accidentally enter, which would afterwards prove a constant source of annoyance. But insects cast their skin at short intervals, at least as long as they are larvæ, and but few live more than a few weeks in the perfect state; and as the larger tracheæ are cast with the skin, it is sufficient to take precautions to prevent anything from penetrating through the spiracle.

In most cases the spiracle is a slit which can be closed, and muscles are provided for the purpose; sometimes instead of one hole there are a number, separated by a horny net-work. These are found in the larva of *Sirex duplex*, and may perhaps be required, because these larvæ live in galleries which they eat in trees, and the wood dust would be very apt to penetrate an ordinary spiracle. In the large water-beetle (*Dyticus*), and in *Cicada*, bushy hairs project from the margin, and the air being thus strained, all extraneous matters are effectually excluded. The spiracles lead into tubes called tracheæ, which in the live insect are constantly full of air. From each spiracle these tubes ramify in all directions, like the roots of a tree, dividing and subdividing until their final branches become so small as to be scarcely discernible. Besides these branching tubes, each spiracle sends a large unbranched one to the tracheæ arising from the spiracles on each side. In this manner the whole body is connected into one system; but for this contrivance, if any one spiracle became stopped up, the organs in its neighbourhood would suffer from want of air.

Besides the tracheæ we find also, in a great many cases, air bladders or vessels; these serve as receptacles of air, and probably assist in giving to the body that lightness which is necessary for flight: in this respect we may compare them to the air vessels which are found in birds; and we shall ob-

serve, as favourable to this hypothesis, that they are particularly developed in certain flies (*Volucella*) and other insects which fly much, and on the other hand that they are absent in all caterpillars and maggots.

Turning now to the mechanism by which the renewal of the air is effected, it will be sufficient to state with regard to the expiration that it appears to be caused by the action of certain muscles which compress the general cavity of the body. This must be materially assisted by the presence of the air-sacks mentioned above, which accordingly are found in those insects which, from their great powers of movement, require a large supply of oxygen.

On the other hand, the inspiration is no doubt caused by the general elasticity of the hard insect skin, assisted by that of the tracheæ. If these organs were formed like other tubes of the animal body, of a simple membranous skin, it would be difficult to imagine in what way when once emptied of air they could ever be refilled. The same plan is however adopted here as in our throats; namely, the introduction of cartilaginous elastic substance, which in mankind is developed in the form of rings, as we must all be aware, but in insects is a thread wound round and round inside the outer membranous tube of the tracheæ.

If we compare this type of the respiratory organs, which is found so far as we know the same in essential points in all perfect insects, except *Pteronarcys*, which has branchiæ as well as spiracles, and in most larvæ, with that which prevails in the *Vertebrata*, or animals with bones, we are at once struck with the fact that in insects the air never enters the body through the mouth, although in a few cases (the larvæ of *Libellula*) the opposite end of the intestinal canal is used for that purpose; and secondly, that the air vessels are not col-

lected into one mass called the lungs, but are scattered throughout the whole body.

The cause for this dispersion we may probably find in the imperfect circulation of the blood; in the *Mammalia*, care has been taken that all the blood should be subjected at very short intervals to the action of the air, and though in the reptiles this is not the case, yet even here a part of the blood thus aërated is carefully mixed with the remainder, which has not been so purified.

But in insects the organs for the circulation of the blood appear much less developed, and though very likely future anatomists may discover far more than we are at present aware of, yet we may perhaps conclude, that, if the blood was aërated in one part only of its course, a large portion would remain without this necessary purification.

As insects never breathe through their mouth, they have of course no voice properly so called, and when they make a noise it is in some different manner, and is usually caused, like the so-called chirping of the cricket and grasshopper, by the rubbing of one part of the body against another. The humming of the bumble bees, blue bottles, &c., forms however, to a certain extent, an exception to this rule, although for this sound three causes have been suggested.

Chabrier (Essai sur le Vol des Insectes, Ann. du Musée, 1820, vol. vi. p. 456), speaking of the blue bottles, observes, that the metathoracic spiracles are covered by several little scales, which are of the colour of the skin, and are fit to give extension and continuity to the sound by their vibrations or their resonance; and if they are removed with care, the insect can still fly, but can scarcely be heard. Burmeister, however, Manual of Entomology, p. 468, says, "If the wings be cut off, the fly produces its former sound, although somewhat weaker . . . . If the *scales be removed, the sound is*

not at all affected; it remains unchanged as long as the wings can vibrate. If the poisers, lastly, be cut off, this produces no difference of sound . . . . The spiracle alone remains therefore to be considered as the cause and instrument of the sound." Following up these experiments Dr. Burmeister dissected the spiracle, and found that the posterior lip is formed into a small, flat, halfmoon-shaped plate: "upon this plate (lo. cit., p. 469) there are nine parallel very delicate horny leaves, the superior free sharp edges of which are bent somewhat downward." . . . "Upon the air, which is driven with force out of the tracheæ, touching these laminæ, they are made to vibrate, and sound precisely in the same manner as the vibrating of the glottis of the larynx."

Kirby and Spence appear only to have seen some extracts from Chabrier's interesting paper (see Kirby and Spence's Edition, 1856, p. 488), and say, "after all the friction of the base of the wings against the thorax seems to be the sole cause of the alarming buzz of the gnat as well as that of other *Diptera*."

Yet I cannot but think that Chabrier and Burmeister have conclusively shown these sounds to be connected with the rushing of the air from the spiracles, and therefore entitled to some extent to the name of voice.

The short description which I have given above applies in essentials to almost all perfect insects, and to the great majority of larvæ. Yet many live in water, and require therefore some modification of the respiratory organs to fit them for this abode.

Although many perfect insects are found only in and about water, there are but few so essentially aquatic as to require any considerable alteration in this respect.

The *Orthoptera* or *Hymenoptera*, as far as we know at present, are without exception land animals. Although many

Diptera (flies) and *Neuroptera* (dragon-flies, may-flies, &c.), and a few *Lepidoptera* (butterflies, moths, &c.), are aquatic when in the larval state, yet the perfect insects of these orders live altogether in the air.

The *Hemiptera* (fieldbugs, &c.), on the contrary, present us with several aquatic insects; many of these however live *on* water rather than in it. Every one must have noticed *Velia currens*, a dark brown, long, narrow insect, which may be seen running on the surface of almost any pond. An allied species, *Halobates Streatfieldiana*, has been found coursing over the ocean midway between Asia and Africa.*

The genera *Nepa* and *Ranatra* live actually submersed, and are provided at the posterior part of the body with two tubes, varying in length according to the species, and which the animal projects out of the water and thus obtains the necessary supply of air.

Among the *Coleoptera* (beetles) three families are essentially aquatic—the *Gyrinidæ*, *Dyticidæ* and *Hydrophilidæ*. Besides these many little beetles live on the seashore, and are covered by the water for hours together. The *Gyrinidæ* or whirligigs must be familiar to all lovers of nature, as they may be seen during summer, in little troops coursing round and round in circles on almost every smooth surface of water, but they are entirely surrounded with air, for the lower part of their body is covered by a thin layer.

The *Hydrophilidæ* have clubbed antennæ, while in the *Dyticidæ* they are filiform (threadlike). The former swim with difficulty, and usually creep along the bottom, or on aquatic plants. They are obliged to come to the surface to breathe, and are enabled to carry down with them a supply of

* Trans. Ent. Soc. of London, vol. 1, p. 230.

air attached to the underside of the abdomen. It is said, that they project their club-shaped antennæ into the air, and then, jerking them back again, bring thus a little air, which they then apply to the under surface of the thorax and abdomen. This manœuvre I have never been able to see; the specimens, the habits of which I have watched, used every now and then to leave hold of the plant on which they were creeping, their own lightness causing them to rise, and the air on their under side turned them over in the ascent. They then crept along the top of the water, back downwards, till they came to some plant, by means of which they again descended. Some of the larger species can swim, but not so easily or quickly as the *Dyticidæ*. This latter family will be referred to presently.

The reason why we find some few aquatic *Hemiptera*, many *Coleoptera*, and none of any other order, is probably connected with the state of the wings. It is evident that the delicate state of the wings of a fly, bee or butterfly would be much if not entirely spoiled by a long sojourn in water; those, on the contrary, of the *Hemiptera* being in great measure, and of the *Coleoptera* entirely, protected by the horny anterior wing or elytra, it is in these orders only that we can expect to find any species with aquatic habits in their perfect state.

Considered in relation to the respiratory organs, however, the most remarkable insect is *Pteronarcys regalis*, a Neuropterous insect from Canada. Among 150,000 species at present known,* this alone possesses branchiæ in its perfect state! Well therefore might Leon Dufour, the greatest Entomological anatomist in the world, express unbounded astonishment at this "extraordinary" and "illegal" fact, and doubt the

* The lowest number estimated by Humboldt in his "Aspects of Nature."

conclusions of even Newport. M. Dufour remarks,* that a gill is an organ especially adapted to aquatic respiration, whose physiological function is to extract air from water, and would, therefore, be useless to an entirely aërial animal. He suggests, therefore, that they may be only the remains of the branchiæ of the nymph, retained—"oblitérées, infonctionables, simplement appendiculaires et vestigiaires."

Yet if we consider Newport's reasoning,† we must, I think, come to his conclusion.

There are eight sets of branchial sacs, or tufts distributed over the pectoral surface of the thoracic segments and first two segments of the abdomen. The three pairs of thoracic spiracles are situated as usual; the abdominal, however, are false, and each lead into a small cavity.

The habits of the insect, though not strictly speaking aquatic, are quite in accordance with the structure of the respiratory organs, for it lives under stones, in crevices of rocks which are constantly wetted by the spray of falling water, and in other damp places.

This single exception to the otherwise universal rule, that no perfect insect breathes by means of branchiæ, may well excite our wonder, and should teach us how cautious we ought to be in all generalizations in Natural History. Considering also how many insects there are of whose anatomy we may be said to be entirely ignorant, it may well be that there are various other interesting modifications of the respiratory organs with which we are as yet unacquainted.

Passing now to the larval stages, we shall meet with much

* Ann. des Sci. Naturelles—"Observations sur les Larves des Neuroptères," v. 17, p. 89, 1852.

† On the Anatomy and Affinities of Pteronarcys Regalis, Linnean Transactions, 1848, vol. xx.

greater variations: this appears to be in accordance with the general law that the very young states of animals often resemble in many particulars fully developed specimens which belong to inferior groups. Thus, as the *Crustacea* and many aquatic annulids respire by means of branchiæ, we should expect to find these organs in many larvæ, and in fewer pupæ or nymphs.

And so it is: many larvæ, for instance, those of the *Gyrinidæ* and of *Parapoynx Stratiotalis*, which possess branchiæ, and others, such as those of the *Dyticidæ* and *Hydrophilidæ*, are aquatic, turn into nymphs or pupæ which live in air.

This rule, however, is not without exceptions: the larvæ of some gnats, though living in water, come to the surface, and inspire air, while the pupæ are provided with branchiæ, which generally project from the thorax. I can in no way account for this exception.

There is, however, this essential difference between the gills of other water animals, as of fishes, and those of insects. In the former the blood or circulating fluid acts through the delicate walls of the tubes in which it runs, on the air contained in the surrounding water, while the gills of insects are membranous expansions penetrated by tracheæ, which imbibe the air contained in the water and carry it into the body, there to be acted upon in the usual manner by the blood. In what manner this is effected, by what mysterious process the air is thus absorbed, is one of those questions which constantly occur to Naturalists, and which we are at present quite unable to answer.

If we now endeavour to ascertain why some larvæ have branchiæ while others are compelled to ascend to the surface and obtain air from thence, we shall soon remark that, as a general rule, slow, inactive, or ill-defended larvæ are pro-

vided with branchiæ, while those that are powerful and active are without any. Thus the strong predacious larvæ of *Dyticus* and *Hydrophilus* respire air by means of openings situated at the tail. They hang suspended from the surface of the water, and the attitude which is necessary for respiration is also exactly that which gives them the best view of their prey swimming about in the water below. The larvæ of some gnats (*Culex*), though not so large, usually live in places—such as water-butts, cow-troughs, shallow pools, &c.,—where they are "monarchs of all they survey;" and having little therefore to fear from the attacks of larger animals, are provided with a short tube projecting at an angle from the tail, and terminating in a spiracle at the end, and, several hairs by which the insect hangs suspended from the top of the water, and makes from thence short excursions in search of food.

The larvæ of the *Tipulidæ* are found in the most varied situations; many of them live in water, and one of them is very peculiar. It is quite transparent, and, therefore, rather difficult to find, though not uncommon in clear grassy pools. It floats horizontally and almost motionless, though, when alarmed, it can swim away with rapidity. The breathing organs are four silvery kidney-shaped organs, two placed anteriorly and two posteriorly. This larva is figured by Reaumur, Histoire des Insectes, vol. v. pl. 6, f. 7, 9. I have often met with it in ponds on commons. The pupa is very different, being provided with two pear-shaped branchiæ which project like ears from the thorax, and give it a very peculiar appearance. It floats perpendicularly and has two leaf-like fins at the tail.

Perhaps, however, the most remarkable Dipterous larva is that of *Eristalis tenax*, Meig. It is a thick, fleshy, unarmed, sluggish grub, and yet breathes air. Living

usually in the very foulest water, it has nothing to fear from the attacks of more powerful insects, and does not require to conceal itself. It is provided with a tail about as long as the body, and perforated at the end. Two large tracheæ pass down the body, uniting posteriorly into one, which, after forming several coils at the base of the tail, passes up that organ, without being attached to it, and finally opens at the end into a large spiracle, surrounded with a star of hairs. The loose coils can, if necessary, be protruded up the tail, so as to extend the tail, if necessary, to five or six inches in length.

By this curious apparatus the animal is enabled to breathe air while remaining at some inches depth in water.

In the larvæ of *Ephemera* we met with a very different type. These animals live in ponds and ditches, where, if they were as defenceless, and at the same time as inactive as the larvæ of *Eristalis*, they would soon fall a prey to some enemy more powerful than themselves; and though they are so formed as to swim with rapidity, even this would be of little avail if they had to remain at the surface of the water to breathe. They are therefore provided with branchiæ, and are thus enabled to remain hidden among the thickets of water-plants.

The branchiæ are attached by pairs to the sides of the abdominal segments, making four to each segment. They consist sometimes of two leaves, as in *E. vulgata*, or of a leaf and a bunch of hairs, as in *E. fuscogrisea*, or sometimes of a narrow stalk clothed on each side with hair-like processes, as in De Geer, vol. ii. pl. 16, f. 3. The leaves agree in structure with the wings of the perfect insect, being formed of a flattened bag into which tracheæ send branches.

Thus as we find many insects with abdominal legs in their larval condition, so we find some which in the same state

have wings, or organs homologous with wings, on the abdomen. The wings of insects, therefore, are branchiæ which have lost their primary function, that of respiration, and become organs of motion. This change may appear extraordinary, but we must remember that we find, conversely, among *Crustacea*, numerous cases, as, for instance, the *Daphniæ*, in which the legs have ceased to serve as organs of locomotion, and on the contrary act as branchiæ. These views have been ably advocated by Prof. Owen, in his Lectures on the Invertebrate Animals, 1st edit. p. 198, but they can hardly be said to be yet generally received by Entomologists.

The larvæ of the *Phryganeæ*, the well-known caddis-worms, live in streams and ponds ; they are slow in their movements, but even if it were otherwise, to say nothing of other enemies that usually live in the same places, they would have but little chance of escaping from the fish.

As we notice throughout the animal kingdom that any loss in one respect is usually compensated by a gain in another, so we find that these slow, delicate creatures are endowed with an instinct which teaches them to make for themselves tubes or cases of sand, bits of stick, or any other material that comes to hand, in which they can live secure.

This contrivance, however, is evidently an obstacle to agility, and the caddisworm is therefore provided with branchiæ, in the form of hairs or processes of the skin, into which the trachcæ penetrate.

We at present know of no Lepidopterous larvæ which can be said to move rapidly. That of *Parapoynx Stratiotalis*, whose aquatic habits have been already alluded to, is no exception to the rule. Living as it does in ponds the same mode of protection is resorted to as in the similar case of the *Phryganeæ*. It forms for itself a tube, and is provided

with branchiæ in the form of hairs, situated on the thorax and anterior portion of the abdomen, which is most exposed to the action of water.

The only other aquatic larvæ which I propose to mention are those of the *Libellulidæ* or dragon-flies: they are slow, awkward insects living in ditches and shallow ponds, and, like the preceding, are provided with branchiæ. But why? Covered with a tough leathery skin, large and armed with powerful jaws, they are well able to protect themselves, and are, in fact, entirely carnivorous. The reason, however, is evident. Unable to overtake their prey by the chase, they lie in wait, hidden by the mud at the bottom of the water, and seize any unwary little creature that may pass within reach. It is evident that they would stand a good chance of dying of starvation if they were compelled to leave their hiding-places, and remain at the surface of the water for air. Moreover, if their branchiæ were situated on the anterior part of the body, like those of *Parapoyna*, or on the abdomen, as in *Ephemera*, a large surface would necessarily be uncovered, which would serve as a warning to the little creatures which constitute their prey. They are therefore situated at the tail, and in the genus *Agrion* are in the form of elongated leaflets in which the tracheæ ramify as usual.

In the larvæ of *Æschna* and *Libellula* (dragon-flies),* on the contrary, the respiratory organs are formed on a type which is without a parallel, and which, though so familiar with the fact, I can never contemplate without a feeling of awe and admiration. The water is sucked in through the posterior orifice into the rectum or lower part of the intestinal canal, on the walls of which the tracheæ ramify in great numbers,

* Burmeister's Man. p. 169; Leon Dufour, Ann. de Sci. Nat. 1852, p. 91.

and extract the air from the water thus brought into contact with them.

Truth is indeed stranger than fiction. What man would have imagined such a machine? What but Almighty wisdom and power could have contrived and carried out these and many other means for supplying air to the internal organs of animals apparently so insignificant?

I have endeavoured in a few instances to point out how the different modifications of these organs are adapted to the different habits of their possessors, but there are many, very many variations, for which we cannot at present, and perhaps never shall be able to account. Some of them, as, for instance, the different forms of branchiæ in the *Ephemeræ*, we may perhaps ascribe to that tendency to variety which we see so strongly in nature. Of what use are the varied tints of different birds and the species of insects? Would not a much fewer number have fulfilled the same purpose?

And in support of this theory we may observe, that where man steps in and destroys many species, to increase the number of individuals of a few most useful to himself, these few immediately begin to vary. The chickens, ducks, pigeons, oxen, cats and horses, which, in a domestic state, are found of such different tints, were probably originally each of one colour; and if they revert to a wild life, they have a tendency to return also again to an uniformity in this respect. (See the observations of Mr. Darwin on the Oxen of the Falkland Isles, in his Naturalist's Voyage, p. 192.)

There is indeed one capital exception to this rule—the sheep; and we shall perhaps be more grateful than fanciful, if we observe that, in this instance only, variety of colour would diminish from the utility to man.

I will conclude with a brief statement of the manner in

which the breathing is effected in four familiar but very different animals.

Firstly, the whale, though often called a fish, is in reality a warm-blooded air-breathing mammal, and must, therefore, come to the top of the water at short intervals. For this purpose the tail is flattened horizontally, which enables the animal to rise and sink very quickly. If it breathed chiefly through the mouth, the action of the tail would tend to drive it out of the water, and much time would be lost in descending, as we know to be the case if we try to dive when swimming. In order to avoid this the nostrils are placed in the highest part of the body, and are made to serve the most important part in respiration.

The fish, on the contrary, is a water-breather, that is to say, it is provided with an apparatus in which the blood makes use of air contained in the water. This apparatus we call the gills; the water enters the mouth, and, instead of being swallowed, comes out again behind the gill-plates. The tail is flattened vertically, and it is by lashing this powerful organ first to one side and then to the other, that the fish darts forward with great velocity, but it cannot rise or sink so quickly as the whale, which is not requisite, as it is no longer under the necessity of coming to the surface to breathe.

In some parts of Scotland it is believed that salmon dart along tail forwards: it is almost unnecessary to say, that this is an error, for not only is it contradicted by the mechanical structure of the animal, but if it were so the fish would be suffocated, for the rushing water would press the gill-plates firmly to the sides of the fish, and no water therefore could reach the gills.

It is remarkable how few know why a fish dies when it is taken out of water, and yet the reason is very simple. When in the water the laminæ of the gills all stand apart,

and the surface is of course equal to the size multiplied into twice the number of the laminæ; but in air all the laminæ fall together, and the surface at which the breathing is carried on being very much diminished, the fish dies literally for want of air. Eels, however, and some others, have the gills contained in pouches, opening by small holes at the side of the head; and, as they thus carry a supply of water about with them, can live for some time out of their natural element.

In the Freshwater Snail (*Lymnæus*) we have gills as in the fish, but the animal not being able to move rapidly, other means are necessary to insure a constant supply of water. This is effected by means of ciliæ or little hairs, which thickly clothe the whole organ, and being in constant vibration, independently of the control of the snail, cause currents which bring a regular supply of water to the gills.

In insects I have already mentioned several methods by which the object is effected. One more I must allude to — that of the common large freshwater beetle, *Dyticus*. The spiracles of this insect are placed on the back under the wing cases or elytra. The two first pairs of legs are rather small and used for walking; the hind pair are strong, flattened and provided with a brush of hairs, and form an excellent pair of oars, propelling the beetle of course forwards. The whole animal is somewhat lighter than water, and the head and thorax are the heaviest parts; therefore, when it ceases rowing, it will of course rise tail-first to the surface. No one who has ever watched a still pond in summer can fail to have noticed the beetles thus coming up to the surface for a fresh supply of air. The back is covered with a velvet-like down, which repels the water. When, therefore, the insect is suspended as it were by its tail from the surface of the water, it has only to lift up a little the elytra and the space between

them and the back will be at once filled with air, a supply of which it is thus enabled to carry about with it. If this animal had breathed through the mouth, it could only by violent exertion have brought the heaviest part of its body to the surface, and, if alarmed, would have had to turn over before the action of the legs could come into play, whereas by receiving the air at the tail, these difficulties are removed and the powerful oars are ready at the least sign of danger to carry their owner, by a few rapid strokes, down to the bottom into the weeds or mud.

Thus I have attempted to give a slight account of the principal modifications of the organs of respiration in insects; but I am well aware that I have only been able to mention a small part of what has been already described, which is itself but a fraction of that which still remains unknown.

Still, though we must confess that God alone can see all that He has made, man also, we may hope, can perceive that it is "very good." Yet are we far from knowing, and perhaps never shall know, how good. Every day we discover fresh wonders, every day new fields of science are opened to us, and the naturalist can with truth adopt the words of the illustrious Newton, "I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me."

DIPTERA.

Dipterous Notes and Queries.

By W. Wilson Saunders, F.R.S.

Can any of the numerous readers of the Annual give me any information respecting the insects, some portion of whose economy I shall attempt hereafter shortly to describe? I ask the question, being aware that a number of our Entomologists are now much interested in the study of the habits and economy of the *Micro-Lepidoptera*, and it will have probably happened to them, that in their investigations they will have found some of my favourites—the *Diptera*—where a moth was expected to appear. I here allude to those Dipterous larvæ which mine in the leaves of plants, and work galleries very similar in construction to some produced by the larvæ of various species of *Micro-Lepidoptera*, so much so that it requires a very practised eye to detect to which order of insects the work of the little miner belongs. Other *Dipterous* larvæ make gall-like excrescences on various plants, which are exceedingly interesting and well worthy of careful examination. My queries belong to both miners and gall-makers, and I will therefore divide my Notes into two divisions, depending on these peculiarities of economy.

First, then, as to miners.

I. The leaves of *Conyza squarrosa* are mined in a very tortuous manner, particularly near the margin, by an elongate,

ovate, very pale dull yellow larva, having the joints of the body very finely hispid. The larva changes into an oval pupa, about the $\frac{1}{8}$ of an inch in length, of a shining black colour, and having two small knob-like projections at one apex, the other being slightly emarginate. I noticed the working of this larva in the neighbourhood of Dover, in the autumn of 1853.

II. A Dipterous larva mines into the leaves of the common daisy, *Bellis perennis*, producing a tortuous mine, which usually runs along one side of the leaf, commencing near the foot stalk, and, crossing the leaf somewhere towards the apex, returns down the other side. The mine I noticed several times near Whitby, Yorkshire, during the month of August, but the larva escaped my notice.

III. The common sow-thistle, *Sonchus oleraceus*, has its leaves often mined by a Dipterous larva producing a whitish intricate vermicular pattern, which is very apparent, the ground colour of the leaf being bright green. The larva is oblong ovate, not more than $\frac{1}{10}$ inch in length, smooth, somewhat shining, and nearly cylindrical, the joints being very obscurely marked. When removed from the mine the larva was exceedingly active and restless. This mining larva appears to be very common, as I have noticed it in various places in the south of England.

IV. A peculiar mine of a Dipterous larva I observed several times in the leaves of the common honeysuckle (*Lonicera Periclymenum*) in the neighbourhood of Whitby, Yorkshire, during the month of August. The mine consisted of a series of gently curved branches, having one common centre, and diverging from it in various directions. The

mine could be easily detected, being well marked by its pale appearance on a dark green ground. The perfect insect seems to make its exit from the mine at a point on the margin of the leaf—the mine terminating there, and a small hole being visible. I could not find the larva.

V. A Dipterous larva mines the leaf of *Pimpinella magna*, making a broad tortuous path, with so many windings that the whole of the substance of the leaf appears at times nearly eaten away. The larva I have not seen. This mine I noticed sparingly in the neighbourhood of Folkestone, Kent, in the month of September.

VI. A long snake-like mine commencing at the margin of the leaf of the common alder, *Alnus glutinosa*, and increasing in size as it advanced, was brought to my notice by my friend Mr. Stainton. He found it near Reigate in September. The larva was dead and shrivelled before I examined it. It was undoubtedly Dipterous.

Now as to the second division of my inquiries, namely, Dipterous larvæ forming gall-like excrescences, I shall be glad of any information which may aid in making the following observations more complete.

VII. At Bulverhythe near St. Leonards, in the beginning of August, I found several gall-like swellings on the stems of the common reed, *Arundo phragmites*, which were composed of the distended bases of the leaves closely packed one over the other, the further growth of the stem having been stopped by the action of a Dipterous larva, which was to be found snugly enjoying itself in the centre of the mass. These gall-like appearances were oblong ovate, varying

from two to three inches in length, and rather better than half an inch in diameter. Short malformed leaves diverged from the gall in all directions. The larva, which was so well protected and provided with food, was about half an inch in length, elongate ovate, tapering at each extremity, white, somewhat shining and translucent.

VIII. On the sand-hills at Land's End, near Whitby, *Triticum junceum* is an abundant plant, and at the commencement of August I found the young shoots near the ground attacked by a Dipterous larva, causing an oval gall-like swelling very similar to the one just described. This gall-like swelling was an inch to an inch and half long, very succulent, and was composed of the thickened basis of the sheathing leaves. The larva was about one-eighth of an inch long, very smooth and glossy, whitish and translucent, subcylindrical, somewhat tapering at the extremities, with a row of short tubercles on the back, one on each joint, commencing with the second and terminating with the eighth joint.

IX. At Birch Wood, the 7th July, I found the stems of *Hieracium umbellatum* attacked by a Dipterous? larva, causing a very hairy pear-like swelling, from which proceeded a number of stunted, well-formed leaves. Some of these gall-like swellings were more than half an inch in diameter, and fully an inch in length. They occurred at the apex of the stems.

X. In a shady part of a wood near St. Leonards, the stems and rhizomas of *Stachys sylvatica* were found in the beginning of September, by my son, covered with small gall-like excrescences about the size of a pea. They occurred in

the axils of the leaves, or terminating the branches, or as knob-like projections from the roots, and were round or oval, yellowish-green, densely hairy, and composed of stunted succulent leaves closely packed together. Each gall contained three or four Dipterous larvæ, about one-tenth of an inch long, ovate elongate, somewhat flattened above and below, white, with a broad brownish yellow streak, extending from the second to the penultimate joint on the underside.

XI. The common Ground Ivy, *Glechoma hederacea*, is attacked by the larva of a Dipterous insect, and produces a gall-like excrescence at the apex of the branches. The gall seems to be composed of a greatly distended and succulent leaf, folded together and soldered at the margin, forming a rounded pointed ball, nearly one-third of an inch in diameter, densely clothed externally with woolly pubescence. I have seen this gall in the vicinity of Mickleham during the month of August.

XII. During the month of August, while hunting over the broken ground at East Wear Bay, near Folkestone, for insects, my attention was arrested by observing an umbel of seed vessels of the common carrot, *Daucus carota*, having one seed vessel among the number of a much larger size in proportion to the rest, greatly distended to a nearly spherical form, and much more free from bristles than these seed vessels usually are. Generally one only was found in an umbel, and on looking carefully to a great number of umbels, I found the fact observed to be very common. Further examination showed me that each of these inflated seed vessels or carpets contains one or two bright orange, very active Dipterous larvæ, about the one-eightieth of an inch

long. The larvæ were sub-cylindrical, tapering at each extremity, and appeared to feed upon the internal succulent walls of their curious abode. My friend Mr. Stainton observed the same fact on Wray Common, near Reigate, Sept. 1856, and obligingly sent me some of the umbels of the *Daucus* so attacked for examination.

XIII. In the vicinity of Dover I have observed the hedge bedstraw, *Galium mollugo*, with some of its seed vessels very much inflated, and assuming a rough, pear-like form. This enlarged seed vessel, if opened at the proper season, August, will be found to contain a small yellow Dipterous larva, one-tenth of an inch long, ovate elongate, more attenuated towards the head, slightly flattened on the upper and under surface. In old and empty inflated seed vessels, which had evidently been the abodes of larvæ, I found a small round aperture near the footstalk, through which the insect had escaped from its prison.

NATURAL HISTORY OF THE TINEINA.

By the Editor.

During the past year no further volume of this work has appeared. But yet the subject has not been lost sight of; a number of larvæ have been described and figured, and a vast amount of observations have been made.

Those who are contributing to the progress of this work are naturally anxious to know to what extent their help becomes serviceable, and with the view of notifying to my coadjutors and others, the amount of assistance I have received in the past twelve months, the following Table has been prepared.

I had made known some time since, that assistance in the discovery and forwarding to me of new larvæ would be recompensed in a peculiar manner, namely, by presenting a copy of the entire series of the Natural History of the Tineina to any one who should *first* discover and communicate to me the transformations of twenty species with which I was previously unacquainted.

Now, in finding new larvæ, there are three distinct steps the discoverer has to make:—

The first, and most important, is the *discovery* of the larva.

The second is the *sending* such larva to me, in order that it may be duly figured and described.

The third is the *rearing* of such larva through its transformations, so as to ascertain the perfect insect produced from it.

It will frequently happen that, whilst one person will first *discover* a new larva, some other Entomologist will be the first to *send it* to me, and a third will perhaps be the successful *breeder*. Hence the reward offered for the discovery and first communication of the transformations of a new species may have to be divided into three shares. Accordingly in the annexed table I have apportioned the reward into three parts:—A half, or ·50, to the discoverer of the larva; a quarter, or ·25, to the party first sending it to me; and a quarter, or ·25, to the party who first rears the perfect insect.

And, as previously no reward was offered or given for the sending of such larvæ as, though previously known, I was still in want of, a quarter prize, or ·25, is here awarded to each person sending me some larva that I wanted, even though its history had already been published.

		Discovered.	Sent.	Bred.	Sent. Known before.
Xysmatodoma melanella	Edleston	..	..	..	·25
Tinea vinculella	Schmid	..	..	..	·25
bistrigella	Boyd	·50	·25	..	
	Logan	..	..	·25	
Lampronia Rubiella	T. Wilkinson	..	..	..	·25
Lamprosetia Verhuellella	Drane	..	..	..	·25
Hyponomeuta vigintipunctatus	Newnham	..	..	..	·25
Padi	Beaumont	..	..	..	·25
*Anesychia pusiella	Frey	..	..	..	·25
decemguttella	H. J. Harding	..	..	..	·25
Cerostoma vittella	Miller	..	..	..	·25
nemorella	Schmid	..	..	..	·25
Depressaria nanatella	H. J. Harding	..	..	..	·25
* parilella	Schmid	..	..	..	·25
furvella	Mühlig	..	..	..	·25
emeritella	Mühlig	..	..	..	·25
*Gelechia Artemisiella	Schmid	..	..	..	·25
tæniolella	Schmid	..	..	..	·25
mulinella	Schmid	..	..	..	·25
nigricostella	Schmid	·50	·25	·25	
*Anarsia Spartiella	Boyd	..	..	..	·25
Ypsolophus fasciellus	Schmid	..	..	..	·25
Harpella Bracteella	Grabow	·50	·25	·25	
Butalis Chenopodiella	Schmid	..	..	..	·25
dissimilella	Schmid	·50	·25	·25	
Acrolepia cariosella	Mühlig	·50	·25	·25	
Perittia Herrichiella	Frey	..	..	..	·25
Argyresthia Goedartella	Brockholes	..	..	..	·25
Cedestis farinatella	T. Wilkinson	·50	·25	·25	
Ocnerostoma piniariella	C. S. Gregson	..	..	·25	
*Gracilaria semifascia	Ashworth	·50	..	·25	
* Kollariella	Schmid	..	..	..	·25
Ornix Loganella	T. Wilkinson	·50	..	·25	
Coleophora Wockeella	Bond	..	..	..	·25
ochrea	Schmid	..	..	..	·25
albicosta	Law	..	..	..	·25
Genistæ	Wailes	·50	·25	·25	
succursella	Mühlig	·50	·25	·25	
Serratulella	Mühlig	·50	·25	·25	
odorariella	Mühlig	·50	·25	·25	

			Discovered.	Sent.	Bred.	Sent Known before.
	Coleophora Dianthi	Mühlig	·50	·25	·25	
	Silenella	Mühlig	·50	·25	·25	
*	ditella	Schmid	..	..	..	·25
	Saponariella	Mühlig	..	..	..	·25
	Coronillæ	Mühlig	..	..	..	·25
	Indigetæ	Boyd	·50	·25	·25	
	Virgaureæ	Schmid	·50	·25		
		Parfitt	..	..	·25	
	argentula	Parfitt	..	..	·25	
*	Vitisella	C. S. Gregson	·50	·25	·25	
*	Cosmopteryx Schmidiella	Frey	·50	·25	·25	
	Laverna ochraceella	T. Wilkinson	·50	·25		
	Raschkiella	Machin	·50	·25	·25	
	Chrysocllista Linneella	Wilkman	..	..	..	·25
	Amydria langiella	Parfitt	..	..	..	·25
	Asychna aratella	Grabow	·50	·25	·25	
*	Stigmatophora Heydeniella	Schmid	..	..	..	·25
	Elachista Pfeifferella	Frey	·50	·25	·25	
	adscitella	Scott	·50	·25	·25	
	tæniatella	Scott	·50	·25	·25	
	Tischeria angustiorella	Frey	..	..	..	·25
	Lithocolletis Bremiella	Schmid	..	..	..	·25
	Vacciniella	C. S. Gregson	..	..	..	·25
	quinquetæniella	Schmid	..	..	..	·25
	Stettinensiella	Schmid	..	..	..	·25
*	populifoliella	Frey	..	..	..	·25
*	Lyonetia padifoliella	Frey	·50	·25	·25	
	Cemiostoma lustratella	Frey	..	..	..	·25
	Bucculatrix Demarjella	T. Wilkinson	·50	·25	·25	
*	maritima	Hemmings	·50	·25	·25	
	Hippocastanella	Ashworth	..	..	..	·25
	nigricomella	Frey	..	..	..	·25
*	Nepticula minuscullella	Frey	·50	·25	·25	
	Tiliæ	Frey	·50	·25	·25	
	centifoliella	Mühlig	..	..	..	·25
	viminetorella	Frey	·50	·25	·25	
	arcuata	Douglas	·50			
		Frey	..	..	·25	
		Boyd	..	·25		
	Weaveri	C. S. Gregson	..	..	..	·25
	argyrella	Boyd	..	..	·25	
	luteella	Boyd	..	..	·25	

From this Table it appears (as was only natural from the greater number of the European species with which I had no personal acquaintance) that the greatest amount of assistance has been received from abroad: but it is very gratifying to observe that the assistance in this country, which used to be exclusively confined to three or four Entomologists, is now gradually diffusing itself among a greater number.

The summary of the Table yields the following results: —

Frey	7·75	Douglas	·50
Mühlig	7·25	H. J. Harding	
Schmid	6·50	Beaumont	·25
T. Wilkinson	3·75	Bond	
Boyd	2·75	Brockholes	
Glabow	2·	Drane	
Scott		Edleston	
C. S. Gregson	1·75	Law	
Ashworth	1·	Logan	
Hemmings		Miller	
Machin		Newnham	
Wailes		Wildman	
Parfitt	·75		

Of those marked thus * in the foregoing Table, I shall be glad to receive further specimens. The larva of ORNIX LOGANELLA I have not yet seen.

NEUROPTERA.

Explanation of Terms used by Dr. Hagen in his Synopsis of the British Dragon-flies (ante, pp. 39—60).

By A. H. Haliday.

As Dr. Hagen's paper is intended to facilitate the naming of specimens by collectors, it occurred to me that an explanation of the peculiar terms used in Libellulology would be very acceptable. I have therefore prepared the following brief explanation:

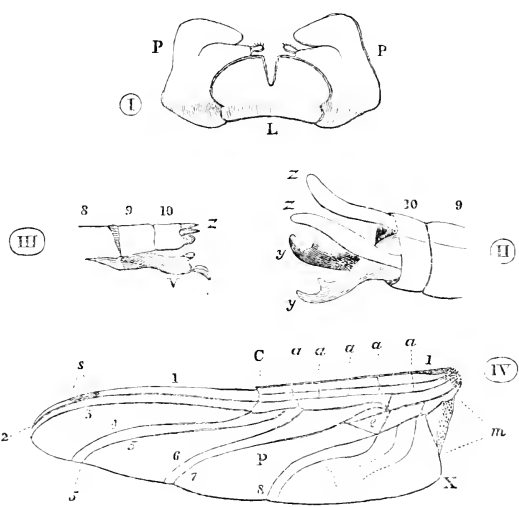

Fig. I. represents the Labium of *Libellula*.

L. The Labium proper, formerly called the middle lobe of lower lip.

P. The Palpi, formerly called the lateral lobes of lower lip.

Fig. II. represents the extremity of the abdomen of a *Cordulia* ♂, seen obliquely.

10 is the last dorsal segment.

z z the upper anal appendages.

y y the lower anal appendages.

Fig. III. represents the extremity of the abdomen of *Agrion* ♀, side view.

10 is the last dorsal segment.

z is the tentacula.

V is the vulvar scale.

Fig. IV. represents the hind wing of *Cordulia ænea*, with the course of the principal nervures only expressed.

X is the anal angle.

m is the accessory membrane (the stippled space).

3, 4, 5, 6, 8, 9 are main nervures, called "Sectors."

1 is the costal nervure.

2 and 7 are the main nervures, called "Radii."

2 is radius principalis.

7 is radius medius.

5 is the subnodal sector.

C is the cubital point.

a—a are the ante-cubital nervures (transverse).

s is the Pterostigma.

e is the triangle.

P is the post-trigonal area (included between the radius medius 7, and the sector 8).

The term "*adult*" used in several of the descriptions arises from the fact that *these insects* are often *many days* on the wing before they get the *mature* colour.

NEW WORKS ON ENTOMOLOGY.

(By the Editor.)

The present year has produced in England several Entomological works of unusual importance.

We proceed to enumerate eight, of which the two last are still in progress of publication.

THE WORLD OF INSECTS; A Guide to its Wonders. By J. W. Douglas, Secretary to the Entomological Society of London. 12*mo. pp.* 244. *Price* 3*s.* 6*d.* London: John Van Voorst.

This little work treats in an easy and pleasant style of the varied haunts which insects frequent, and commencing truly with the beginning, the first chapter treats of "the house." One is really surprised, how much there is to be noticed in the habits and ways of the insects occurring actually in our habitations. The successive chapters are headed: The garden—The orchard and fruit garden—The fields—The hedges and lanes—The fences—The heaths and commons—The downs—The woods—The waters—The sea shore and the mountains.

As a specimen of the aim and intent of the writer, we quote the preface entire.

"'Business must be attended to.' Undoubtedly. There is no need to insist upon the maxim, for it is observed as religiously as if it comprised the whole duty of man. Rather should it be, 'the intervals of business must be attended to.' Business is a compulsory affair, a man's leisure is his own; and for his own sake, as well as that of the community, it should be leisure of occupation. And, as mere mercantile business has a tendency to contract the range of thought, and to give a money value to all matters, a man's

pleasures and recreations should have a contrary character, and cultivate those powers of his mind that are untouched by his business avocations; in order that he may see all things on both sides and in their true light.

"There is no employment for leisure hours, whether they be the few of the man of business or the many of the man of no business, more innocent in itself or more productive of benefits than the pursuit of Natural History generally; and Entomology, or the Natural History of Insects, on account of the number, beauty and accessibility of its objects, has peculiar advantages as a means of popular recreation. Once begun, *ennui* and the want of something to do vanish, every step is on enchanted ground, and on all sides the prospect becomes more and more enticing. The inducement to go out of doors,—the walk with a purpose in view,—so different to that most dreary of all employments, walking for the sake of exercise,—is itself no mean advantage. Then the collector wants to know something about the nature of the insects he has acquired, and begins to study their habits, forms and relationships. This calls into exercise the practice of patience, of minuteness and accuracy of observation, and eventually of cautiousness in induction and generalization; all of which, besides their value as elements of mental discipline, are qualities serviceable in an eminent degree in the business of life. Bonnet has said, 'when I see an insect working at the construction of a nest or a cocoon, I am impressed with respect, because it seems to me that I am at a spectacle where the supreme artist is hid behind the curtain.' Who can view such scenes continually without forgetfulness of self, and having his thoughts carried upwards, and becoming not only a wiser but a better man?

"Contrast with such an employment of leisure, the way in which the majority of young men spend their spare hours,—dissipation, frivolous amusements, or the ephemeral literature of the day,—and who can be surprised that the result, so far as regards the cultivation of the individuals, is *nil*, the balance being on the other side. There is a minority of young men, I know, that do better than this, yet, without any desire to undervalue literature or art,—nay, with every inclination to reverence and appreciate genius of every kind, whether showing the power of mind over mind, or the power of mind over matter,—I still believe that man and his doings, his follies and his crimes, engage too much of our attention. And if we go beyond the circle of human sympathy, I fear we are too prone to be passive; we like knowledge to come to us secondhand—filtered through other men's brains; and we take their conclusions —the truth as it appeared to them—to be the whole truth. But no

man, however great, has so thoroughly comprehended any subject as to have exhausted it; every phase of nature has yet at least another point from which it may be viewed. For observers and reasoners Natural History still offers a boundless field. I have no wish to elevate Entomology above its rank in the scale of Natural History science, nor to laud it as a panacea for the evils accruing to society from the waste of time; but I am sure that whether as a recreation, a study, or both, it would give to multitudes a pleasure, of which, although so sadly in want, they have now no idea.

"When it is considered that there are above ten thousand species of insects in Britain, it will be obvious how few of the wonders of insect life I have been able to indicate within the limited compass of these pages. For the same reason it will easily be understood that no single individual can ever hope to have within his own experience the Natural History of even the insects of his own country; and when the facts I have mentioned have not come under my own eyes, or when they have already been graphically set forth by others, I have preferred, as the more effective and honest course, to quote the very words of the narrators, rather than to give a story of my own founded upon them.

"My endeavour has been to put some of the more prominent and interesting characteristics of insect life into a readable form, to point out some of the best localities for insects, and the methods of capture, with the hope that the readers will be induced to go and examine the objects for themselves. If I shall have succeeded in this labour of my leisure hours, I may be induced to continue the work; but at any rate I shall be happy to answer any inquiries addressed to me through the post."

PRACTICAL HINTS RESPECTING MOTHS AND BUTTERFLIES, WITH NOTICES OF THEIR LOCALITIES; FORMING A CALENDAR OF ENTOMOLOGICAL OPERATIONS THROUGHOUT THE YEAR IN PURSUIT OF LEPIDOPTERA. BY RICHARD SHIELD. 12*mo. pp.* 194. *Price* 3*s.* LONDON: JOHN VAN VOORST.

This work divides the subject, not into the *places* where insects occur, but into the *months* in which they are met with; thus, there are twelve chapters, one for each month in the year, and under each month the reader is cautioned what Lepidopterous insects he should be searching for, and how and where he is likely to find them. In our younger days how we should have revelled in such a book?

We well remember how we gloated over the pages of the Calendar of Samouelle's Entomologist's Compendium.

In the chapter for January, we have information as to the apparatus required for breeding insects, and an excursion to Wickham.

In the chapter for February we have a caution against believing every thing we read in books (and never was caution more needed, the young especially are so apt blindly to swallow whatever they see in print), and an excursion to Plumstead.

In the chapter for March we have a discourse about sugaring, and an excursion to Sanderstead.

The opening portion of the chapter for April incites the collector to humility and industry, and then follows an excursion to Dartford Heath.

As a specimen of the book, we quote the following from the chapter for August.

"It was remarked by the celebrated Dr. Johnson, on being told that a person whom he knew had destroyed himself, 'that he never would have done so had he learnt how to hem a pocket handkerchief.' Now, to how many of the working men of this country, who now find the little time which they can call their own, after the labours of the day are over, hang heavily on their hands, may this remark apply; many of them listlessly sitting in the chimney corner with a pipe in their mouths, their thoughts of as little practical worth as the smoke that wreaths round their heads; some victims to *ennui*, not knowing how to spend their time or what to do, and many, I grieve to say, spending their time in a more than questionable manner to the profit of the publican and the degradation of themselves—to how many of this class would the study and contemplation of the works of nature bring happiness and contentment, raising them from the grovelling and debasing tendencies that kind of society into which a working man is usually thrown produces, expanding his intellect, giving him larger and more comprehensive views of the great plan of creation, and the relations we bear to each other and the world at large; and fostering in him habits of observation and reflection eminently calculated to make him a better citizen and a better man. The habits of order, reflection and energetic industry he will have acquired in the pursuit of Entomology (and indeed by all branches of Natural History the same effect will be produced upon the earnest student), will tincture all his actions, and thus he will not only become more happy as a man, but more valuable as a servant."

It may surprise some of our readers to hear that the writer of the work before us is himself "a working man." The Author of "Alton Locke" observes in the 3rd Edition of "Glaucus," "I would

gladly devote more space than I can here spare to a review of this little book, so perfectly does it corroborate every word which I have said already as to the moral and intellectual value of such studies."

INSECTA BRITANNICA—DIPTERA. *Vol.* III. By Francis Walker, F. L. S. 8*vo. pp.* 352. *With* 10 *plates. Cloth. Price* 25*s.* London: Lovell Reeve and Co.

This volume, the concluding volume on the Diptera, as originally intended (though we now hear there is some talk of another supplementary volume), comprises the Nemocera and the Suctoridea, or Fleas, which are considered by Mr. Walker as belonging to the order Diptera.

The Nemocera he divides into ten families, viz.—1. *Mycetophilidæ*. 2. *Cecidomyidæ*. 3. *Bibionidæ*. 4. *Simulidæ*. 5. *Chironomidæ*. 6. *Culicidæ*. 7. *Phlebotomidæ*. 8. *Heteroclitæ*. 9. *Tipulidæ* and 10. *Rhyphidæ*.

It must be very gratifying to Mr. Walker to hear the *dictum* of the great Dipterist of Posen, Professor Loew, that the arrangement "adopted by Mr. Walker is one of the best, or even *the* best, systematic arrangement of the *Diptera* that has yet been proposed."

In the precise definition of species Mr. Walker has not been so happy, and here there is much to be desired; but considering how vast is the subject, and how little encouragement the *Dipterist* receives, we ought not to feel surprised at the frequent absence of that almost mathematical precision which the describers of *Coleoptera* and *Lepidoptera* have now attained.

They have the advantage of having the differential characters of species pointed out by some twenty or thirty pair of discerning eyes, for many Entomologists who never wrote a book, nor even a scientific paper, are most serviceable to the scribbling generation by calling their attention to the differences, minute yet constant, which tend to show the specific distinctions of certain insects. The *Dipterist* has not this advantage, he works almost alone. Is it surprising he should occasionally stumble?

Professor Loew (in the Review already alluded to, Nat. Hist. Review, p. 92) remarks, "This work appears to fall very short of what a Fauna of Britain ought to contain. The species already known as British are not fully enumerated (in the second volume especially), neither are the species given, all unquestionably indigenous; on the contrary, many are introduced on mere conjecture and probability, as a considerable proportion of the species

of *Ceratopogon* and *Cecidomyia* in the third volume. In the second volume many are mentioned merely by name as British, the specific identity of which is in nowise authenticated, but in many cases is, in all probability, mistaken. The object of enabling the collector to name his insects in the readiest and shortest way is not at all satisfactorily attained. The analytic tables, intended as a guide to the determination of the species, come very near the mark indeed in some cases; as in the family *Dolichopidæ*, where the analysis only wants to be carried out further, when it leads to several species collectively. In other cases, they have a semblance of precision, which tends rather to mislead, as in the genera *Tachina* and *Anthomyia*. The diagnoses and descriptions are not of uniform quality in all the families; sometimes the description is little more than a translation or paraphrase of the diagnosis, where the repetition should have been avoided, if but for the sake of saving room; nor, in fact, does there appear any good reason for keeping the two distinct. It would have been better if Mr. Walker had consolidated them, confining himself to the distinctive characters, especially those of form, and signalizing the differences from the nearest allied species more particularly than he has done. Scarcely any directions are given where to find the insects, or how to procure them by rearing; and this in a work professedly intended for the use of collectors.

"Scientific Entomologists have neither right nor motive to look down on those who occupy themselves chiefly with collecting; but on the contrary, the strongest reasons to afford them all possible encouragement and aid. The recruits of science must be drawn from the ranks of the collectors, and many mere collectors have rendered as much good service to science as scientific smatterers have done harm by their scribbling."

This last paragraph will naturally not be very palatable to those who look upon themselves as *Dons* in the science, far removed from the collecting *profanum vulgus*. Encourage and incite the collector to further progress by all means, but do not show that you view him with contempt and scorn: by so doing you draw more widely a line of demarcation between those who have not yet crossed the threshold of the temple of the science, and those who are already within its precincts. If the object of those who have entered the *penetralia* be merely *distinction*, such conduct on their part is natural enough, as by depreciating their neighbours they fancy they exalt themselves: need we add, that we view such conduct as the offspring of a *puerile vanity*, loathsome in the eyes of all right-minded individuals.

INTRODUCTION TO ENTOMOLOGY; OR, ELEMENTS OF THE NATURAL HISTORY OF INSECTS. COMPRISING AN ACCOUNT OF NOXIOUS AND USEFUL INSECTS; OF THEIR METAMORPHOSES, FOOD, STRATAGEMS, SOCIETIES, MOTIONS, HYBERNATION, INSTINCT, &c. BY WILLIAM KIRBY, M.A., F.R.S., F.L.S., Rector of Barham; AND WILLIAM SPENCE, ESQ., F.R.S., F.L.S. *Seventh Edition, with an Appendix relative to the Origin and Progress of the Work. In one closely printed Volume of* 607 *pages. Crown* 8*vo. price* 5*s. Cloth.* LONDON: LONGMAN, BROWN, GREEN AND LONGMANS.

In the volume before us we find prefixed the following note.

"This work is now published at one-sixth of the price of the sixth edition, so as to bring it within the reach of all desirous of becoming acquainted with the Natural History of Insects, and thus carrying out more effectually the object of the authors,—that of introducing others to a branch of science which they have found so delightful. Though compressed by a smaller type into one volume, it contains every line of the sixth edition, which included much new matter not in the five preceding editions; and to render the work more complete, the account of its origin and progress, furnished by Mr. Spence to the *Life* of Mr. Kirby by Mr. Freeman, is, with his permission, given as an Appendix."

From a notice in the Natural History Review for 1856, p. 51 (which we are inclined to attribute to the pen of Mr. Patterson, of Belfast, whose "Zoology for Schools" already enjoys a circulation of eighteen thousand), we extract the following:—"No work in the English language we believe has done more than Kirby and Spence's learned and popular Introduction to spread the taste for Natural History at home, and to extend for it the sphere of observation, from the more conspicuous but limited field which the Vertebrata affords, to the countless species, and more varied history, transformations and instincts, of the Annulata, and thence indirectly to all the lower forms of animal life. Nor has its popularity been limited to one tongue or country, but either through the medium of translations, or by the obvious influence which it has exercised, ever since, over the most esteemed elementary books in other European languages, the influence given has been propagated extensively in a widening circle. In noticing this new edition, however, it is with home readers we have to do, and

especially with the young, who enjoy a privilege that we of a former generation were debarred from, in being early admitted to fields of instruction and delight, which some time ago were strictly fenced off from the narrow pen-fold of 'general education.' . . . . . The book is, indeed, a marvel of cheapness, considerably more than 600 closely-printed octavo pages for 5*s*. . . . . To our readers old and young—parents, children, teachers, respectively, we say, 'buy and read,' enjoy, verify and enlarge, by the use of your own eyes and faculties, the curious details in rural economy, animal biography, and mental philosophy, amassed with so much study and personal observation, and digested with equal taste and judgment by the learned authors indissolubly associated in fame and remembrance, as they were in life-long friendship, though now for a little while separated by a temporal change. To the survivor of the two, we owe a very charming addition to the volume in the shape of letters and recollections connected with the first conception and progress of the work, and the cordial friendship which, having originated and matured the undertaking, so long survived its completion and participated its success."

THE ENTOMOLOGIST'S WEEKLY INTELLIGENCER FOR 1856. 8*vo*., *pp*. 212, *cloth*. *Price* 9*s*. London: E. Newman, 9, Devonshire Street; W. Kent and Co., 51 & 52, Paternoster Row.

This originally appeared in penny* weekly numbers, and as an instantaneous *medium* of communication between Entomologists in all parts of the country it has proved most serviceable. The low price and the amount of amusing matter infused into it rendered it

* Of course 26 penny numbers only cost 2*s*. 2*d*.: why then is the entire volume charged 9*s*.? Simply for this reason; the circulation was not sufficiently extensive to make the sale at a penny remunerative. Several Entomologists suggested a subscription should be made amongst them for the amount of the *deficit*. This the Editor declined, but having a number of copies on hand, he fixed on the complete and bound sets such a price, that, if the whole were cleared off at that rate, the loss would be *nil*, or nearly so.

The Editor wishes to make the continuance of the "Intelligencer" a certainty: at present it is only an experiment. Every additional subscriber increases the chance of the "Intelligencer" being continued. The Editor would like to have it occasionally illustrated with wood-cuts. Is he too sanguine? The number of Entomologists is daily increasing.

a favourite with many, who would shrink from taking up an ordinary scientific work. Yet in spite of all we have said or written on this subject, there still exist people so stupid as to maintain that scientific books should be adapted only to the capacities of those who are already scientific, and should not be partially adapted to the capacity of the unlearned, with the view of tempting them to move forward in a scientific direction. Every reader found in the Intelligencer something he could understand and appreciate.

It was by some considered an extremely wild-goose speculation to attempt to bring out a penny weekly journal in any degree scientific, and in good truth, a few years ago, this would not have been practicable; but, thanks to Mr. Milner Gibson and his colleagues, their endeavours to remove the taxes on knowledge, and their success in obtaining the repeal of the newspaper stamp and advertisement duty, have rendered that possible, which previously was not so. The day we trust is not far distant when the paper duty, that great foe to education and civilization, will also be removed, *it is already doomed*, and the first possible opportunity that occurs of repealing the excise duty on paper no chancellor of the exchequer will venture to incur the odium of retaining it.

The Entomologist's Weekly Intelligencer will be resumed next April, and we trust all who wish well to it will give it their energetic support; it is not yet self-supporting, and it is only by a large increase in the number of subscribers, that we can insure the permanent continuance of so useful a journal. Those who wish their copies forwarded by post are requested to transmit 4*s.* 4*d.*, in postage stamps, to E. Newman, 9, Devonshire Street, Bishopsgate Street, on or before March 20th, 1857. Two copies will be sent weekly for a remittance of 6*s.* 6*d.*; three copies for 8*s.* 8*d.*; four for 10*s.* 10*d.*, or five for 13*s.*

ON THE VARIATION OF SPECIES, with especial reference to the Insecta; followed by an Enquiry into the Nature of Genera. By T. Vernon Wollaston, M.A., F.L.S. 8*vo. cloth. Price* 5*s.*

London: John Van Voorst.

This is a remarkable book in several respects. In the first place, though Mr. Wollaston's name is indissolubly connected with a quasi-elephantine quarto of formidable weight and dimensions, the present work of his is an ordinary-looking small octavo, and can be carried in the coat-pocket; so that no one need be afraid of ordering it, for fear that when it arrives he should not be able to get it on to any of his bookshelves.

In the second place, it is a valuable and philosophical work written in a suggestive spirit; the bulk of the work being occupied by a consideration of the extent to which species undergo variation "from climatal causes generally,"—"from temporary heat or cold of an unusual degree,"—"from the nature of the country and of the soil,"—and "from isolation and exposure to a stormy atmosphere." Individual examples that have come under Mr. Wollaston's own observation are given of the effect of these different influences, and *nothing is dogmatically stated.* The reader is allowed to deduce his own inferences from the facts brought under his notice.

In the third place this work is remarkable for having escaped the notice of the "Athenæum:" week after week have we glanced through the pages of that journal, but hitherto we have failed to light on an article on Wollaston '*On the Variation of Species.*' Of course we are led to speculate on the cause of this omission, and the only conclusion we have come to is, that the party who reviews Entomological books for the Athenæum (apparently a harmless, well-meaning individual, not overstocked with brains) found the book too deep for him; he could not understand it, so solved the Gordian knot by not saying a word about it. We know not whether it was entrusted to the same party to review who had noticed in 1854 the '*Insecta Maderensia,*' but that book had plates, and therefore appealed more vividly to the senses, and the plates, if we remember rightly, were more highly praised than the rest of the book—we presume because they were more within the capacity of the reviewer. We hope in saying this we are not "treading on the corns" of any of our friends, but even if that should be the case, we cannot unsay it—excess of politeness is not our weak point.

A MANUAL OF BRITISH BUTTERFLIES AND MOTHS. By H. T. Stainton. *In threepenny monthly numbers of* 24 *pages.* 12*mo.* *Illustrated with wood-cuts.* *Nos.* 1—10. (*To be completed in about* 30 *numbers.*)
London: John Van Voorst.

The object of this book is to serve as a *first book* for collectors of *Lepidoptera;* it is intended to teach them to read descriptions of species with the view of naming their specimens. Hitherto not one collector in a hundred has ever attempted this. The fault rested not entirely with the collector, because many of the published descriptions were unserviceable. A few wood-cuts are given in "the

Manual;" mainly with the view of making it showy and taking with those who would be afraid of a book without pictures—but it is not intended or expected that collectors should attempt to name their specimens solely from the wood-cuts.

Tabular views of the genera and families are given wherever practicable, with the view of facilitating the naming of specimens.

The generic characters are only briefly given, and only those which are most conspicuous are noticed; the structure of the palpi, the venation of the wings and other microscopic distinctions on which frequently the separation of genera has been founded, are not alluded to; they would have been misplaced in an elementary work.

At the commencement of each family or group some readable generalisations are introduced, and the attention of the incipient is called to the species he is first likely to meet with and the haunts they frequent, thus rendering as profitable as possible the collector's "first season."

That two thousand copies of each number are sold within the month, and that the sale of No. I. already exceeds 3,500, speaks favourably for the desire of information it manifests in the bulk of our collectors.

The first volume will close with the fourteenth number, which will bring the *Noctuina* to a conclusion.

Before commencing the *Geometrina* it is necessary to wait for the appearance of M. Guenée's work on that group. M. Guenée has so well worked through the *Noctuæ*, that it would be a sad pity, for want of a little patience, to be unable to avail ourselves of his labours among the *Geometræ*. On the appearance of his volumes on "the waves and carpets," we will at once set to work to carry out his arrangement in "the Manual," but in the interim we trust our readers, and the readers of "the Manual," will not be annoyed if a few months' interval occurs between the appearance of No. XIV. and of No. XV. "What is worth doing at all, is worth doing well;" and though as many of our readers are young, we cannot expect them to be overstocked with patience, we trust they will see the force of our reasoning.

ELEMENTS OF ENTOMOLOGY: An Outline of the Natural History and Classification of British Insects. By W. S. Dallas, F.L.S. *In sixpenny*

monthly numbers of 24 pages. 8vo. *Illustrated with woodcuts.* *Nos.* 1—3 (*to be completed in* 15 *numbers*).

LONDON: JOHN VAN VOORST.

Who is there among our elder readers who has not been asked probably a dozen times, "Can you recommend me any cheap, good general work on Entomology?" and who is there that hasn't after consideration recommended some work such as Westwood's "Text Book" or Newman's "Grammar," not as the really good general work inquired for, but as *the best they could think of*. Mr. Dallas's book is intended to be the really good general work inquired for, and judging from what we have seen of it, it seems likely to answer the end in view. It has been the writer's aim to avoid dryness, and to steer clear of all intrusion of fanciful theories (for theories should carefully be eschewed by all writers of elementary works). It is a work which we cordially recommend to all parents in want of a solid yet readable book by which their children may learn something concerning all the tribes of insects found in this country.

Those who wish to learn anything about the insects which occur in every part of the globe *must* have recourse to Westwood's "Introduction to the Modern Classification of Insects;" and as the number of copies of that work remaining must now be much reduced, those who think they are likely to want the work will do well to apply early.

From the Entomological works recently published on the Continent we have unfortunately only space to notice a few.

SYSTEMATISCHE BEARBEITUNG DER SCHMETTERLINGE VON EUROPA; ZUGLEICH ALS TEXT, REVISION UND SUPPLEMENT ZU JAKOB HUEBNER'S SAMMLUNG EUROPAEISCHER SCHMETTERLINGE. Von DR. G. A. W. HERRICH-SCHAEFFER. 6 *Vols.* 4*to. with* 636 *coloured Plates, and* 36 *outline Plates (of dissections). Price* 200 *Thalers, or* £30. REGENSBURG: G. J. MAINZ.

The year 1856 will long be memorable in the annals of Entomological literature, as the year in which Herrich-Schäffer's great work on the Lepidoptera of Europe, commenced in 1843, was happily brought to a conclusion.

Compared with all previously existing works on the same subject what a gigantic undertaking does it seem!

This work, as its title page informs us, serves as a Text, Revision and Supplement to Hübner's five volumes of Plates of the Lepidoptera of Europe. Hübner's work contains 790 coloured Plates, and Dr. Herrich-Schäffer now offers this valuable work (rendered even more valuable by his own critical remarks on the figures) at the reduced price of £30.

Descriptions of all the species hitherto detected in Europe, with remarks on their times of appearance, localities, and food plants; analytical tables of many of the genera and families; and the genera all characterized more or less critically; are sufficient to show that the letter-press has not been neglected, and that, though the magnificence and accuracy of many of the figures leaves nothing to be desired, the work has high claims to our attention for the intrinsic value of the letter-press.

We do not agree with Dr. Herrich-Schäffer in his Systematic arrangement; therefore we can the less be suspected of praising his work because it reflects our views. Indeed some parts of the arrangement appear *to us* fanciful and erroneous in the extreme; but it does not follow because *we* are unable to appreciate the novelties in the system here developed, that they really are blemishes. And certainly there is a conscientiousness about the work which we seek for in vain in the descriptive publications of Treitschke, Duponchel or Stephens. Herrich-Schäffer may not always have succeeded in his attempts, but his work impresses us with the conviction that he has earnestly worked at his subject. We do not find that towards the end it is written in a careless or slovenly manner.

Unfortunately so few of our British collectors study the Lepidoptera of *Europe*, that the sale of this magnificent work must always be very limited in this country. The large proportion of European *Bombyces* and *Noctuæ*, which do not occur in the British Isles, will deter many from purchasing this work, who, if the bulk of the European species had occurred here, would have been tempted to add such a literary *bijou* to their library.

Of the *Tortrices* a much larger pooportion are common both to us and to the Continent; and in the *Tineæ* it is only a few of the European species which are not likely to be found here.

Should it interest any one to know that the Fourth and Fifth Volumes, containing the Micro-Lepidoptera, with 214 coloured Plates, are to be had separately, we are commissioned* by Dr. Herrich-Schäffer, to receive orders for these two volumes for £9.

* If any one likes to favour me with an order for these two volumes, I will at once write to Dr. H. S. to forward them here. H. T. S.

DIE TINEEN UND PTEROPHOREN DER SCHWEIZ. Von Professor Heinrich Frey. 8vo. *pp.* 430. *Price* 7*s.* 6*d.* Zurich: Meyer and Zeller.

A systematic descriptive work on the *Tineæ* and *Pterophori* of Switzerland, by one so fully qualified for the task as Professor Frey had already shown himself to be, is no unimportant addition to the already rich stores of German Entomological literature. Every fresh work which emanates from the brains of that deep-thinking and hard-studying race renders a knowledge of German literature more and more necessary to the earnest seeker after scientific truth. We cannot translate all the German works as fast as they appear, nor is it desirable that we should do so, since there is always a risk that in translation some of the force and precise meaning of the original writer will be lost. German is much more generally taught in schools than used formerly to be the case, but is it yet sufficiently so? Languages are easier learnt when we are young, than at a more advanced period of life, and the boy of fourteen may miss the golden opportunity, which the man of twenty-four will regret.

Frey divides the *Tineæ* into fifteen families:—I. *Exapatidæ*; II. *Tineidæ*; III. *Micropterygidæ*: IV. *Hyponomeutidæ*; V. *Plutellidæ*; VI. *Gelechidæ*; VII. *Œcophoridæ*; VIII. *Glyphipterygidæ*; IX. *Argyresthidæ*; X. *Coleophoridæ*; XI. *Gracilaridæ*; XII. *Elachistidæ*; XIII. *Lyonetidæ*; XIV. *Lithocolletidæ*; XV. *Nepticulidæ*. He has thus two families more than are admitted by Stainton in his volume of the Insecta Britannica, for Frey separates the genus *Micropteryx* from the *Tineidæ*, making of it a distinct family, *Micropterygidæ* (a position which probably few will feel disposed to deny to these singular insects); and he also separates the genera *Dasycera*, *Œcophora*, *Butalis*, *Pancalia* and *Endrosis* from the *Gelechidæ*, forming thereby his family *Œcophoridæ*, a step undoubtedly in the right direction, if only it can be maintained. Many of our readers, who were dissatisfied with the removal of the genus *Semioscopis* from its time-honoured place, will be pleased to hear that Frey returns it to the *Exapatidæ*, placing it immediately after *Chimabacche*.

One very gratifying feature we notice in Frey's work is, that from the increased number of observers throughout Europe of this group of insects during the last ten years, some progress has been made in establishing the geographical range of species. This must ever be one of the most interesting branches of the studies of an Entomologist; but before it can be attempted to be thoroughly followed up, not only must the number of observers in different

countries be increased, but they must learn to call the same insect by the same name, and therefore it is that the rectification of nomenclature, which to short-sighted individuals appears such a "much ado about nothing," is a most essential preliminary. It is not the be-all and end-all of Entomological inquiry, but it is absolutely necessary before further progress can be made. The astronomer before he makes an observation satisfies himself that his instruments are true and correct; for if not, of what use will be the observation? The Entomologist *must* act in like manner.

We would gladly see more local Faunas worked out as this of Frey's is done, and we trust the day is not distant when at least we shall have one from Frankfort on the Maine.

FAUNE ENTOMOLOGIQUE FRANÇAISE, ou DESCRIPTION DES INSECTES QUI SE TROUVENT EN FRANCE —COLEOPTERES. PAR LEON FAIRMAIRE ET LE DR. A. LABOULBENE. PARIS: DEYROLLE, Rue de la Monnaie, 19.

The third livraison of this work has appeared this summer; we are expecting a supply of it, but it has not yet come to hand, and therefore we can do no more than announce its publication.

NATURGESCHICHTE DER INSECTEN DEUTSCHLANDS; BEGONNEN VON DR. W. F. ERICHSON, FORTGESETZT VON Dr. H. SCHAUM, G. KRAATZ, UND H. VON KIESENWETTER. ERSTE ABTHEILUNG—COLEOPTERA.

Mr. Janson has obliged me with the following notice of this work.

"Arrangements having been entered into with Dr. Schaum and MM. Kraatz and Von Kiesenwetter, to continue this important work so ably commenced by the late Dr. Erichson, but suspended since his lamented decease in 1848, these gentlemen appear to have entered on their labours in earnest.

"Dr. Schaum has undertaken the earlier families, and the first part of the volume devoted to them (vol. i.), containing the 'Cicindeletæ,' and a portion of the 'Carabici,' issued from the press in the summer.

"Of vol. ii., entrusted to Herr Kraatz, and comprising the

'Staphylinii,' etc. the first and second parts made their appearance simultaneously, and at the same period as the foregoing.

"Of Volume iv., by Herr Von Kiesenwetter, containing the 'Malacodermi,' etc., we look daily for the publication of the first instalment.

"The third volume, by Dr. Erichson, and on which the five concluding years of the brief but memorable career of the illustrious author were employed, was published in 1848: it contains the families 'Scaphidilia, Trichopterygia, Anisotomidæ, Phalacrides, Nitidulariæ, Colydii, Cucujipes, Cryptophagides, Mycetophagides, Byrrhii, Georyssi, Parnidæ, Heteroceridæ and Scarabæides.'

"This work, as its title indicates, is a Natural History of the Coleopterous Insects of Germany, and furnishes the student not only with full and careful descriptions of the genera and species indigenous to that country, together with an account of their earlier stages, physiology and habits, but also with much important information relative to those of other and distant lands.

"The high standing in the scientific world of the gentlemen engaged on this work renders any recommendation on our part superfluous: and the fact that, with a very few exceptions, all the species of Coleoptera found in this country are known as inhabitants of Germany likewise, will make it obvious to those occupied in investigating the British Coleoptera, that this is of all others the book which they should adopt as their guide and *vade mecum*, at all events until a new descriptive treatise in their own language can be elicited from our little band of working Coleopterists."

On Saturday, April 4th, 1857, will be published

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(THE FIRST NUMBER OF THE NEW VOLUME)

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