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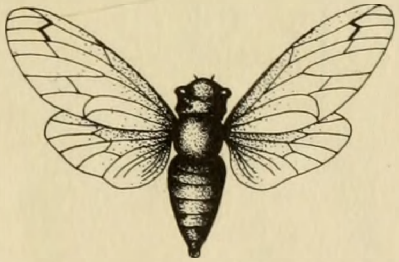

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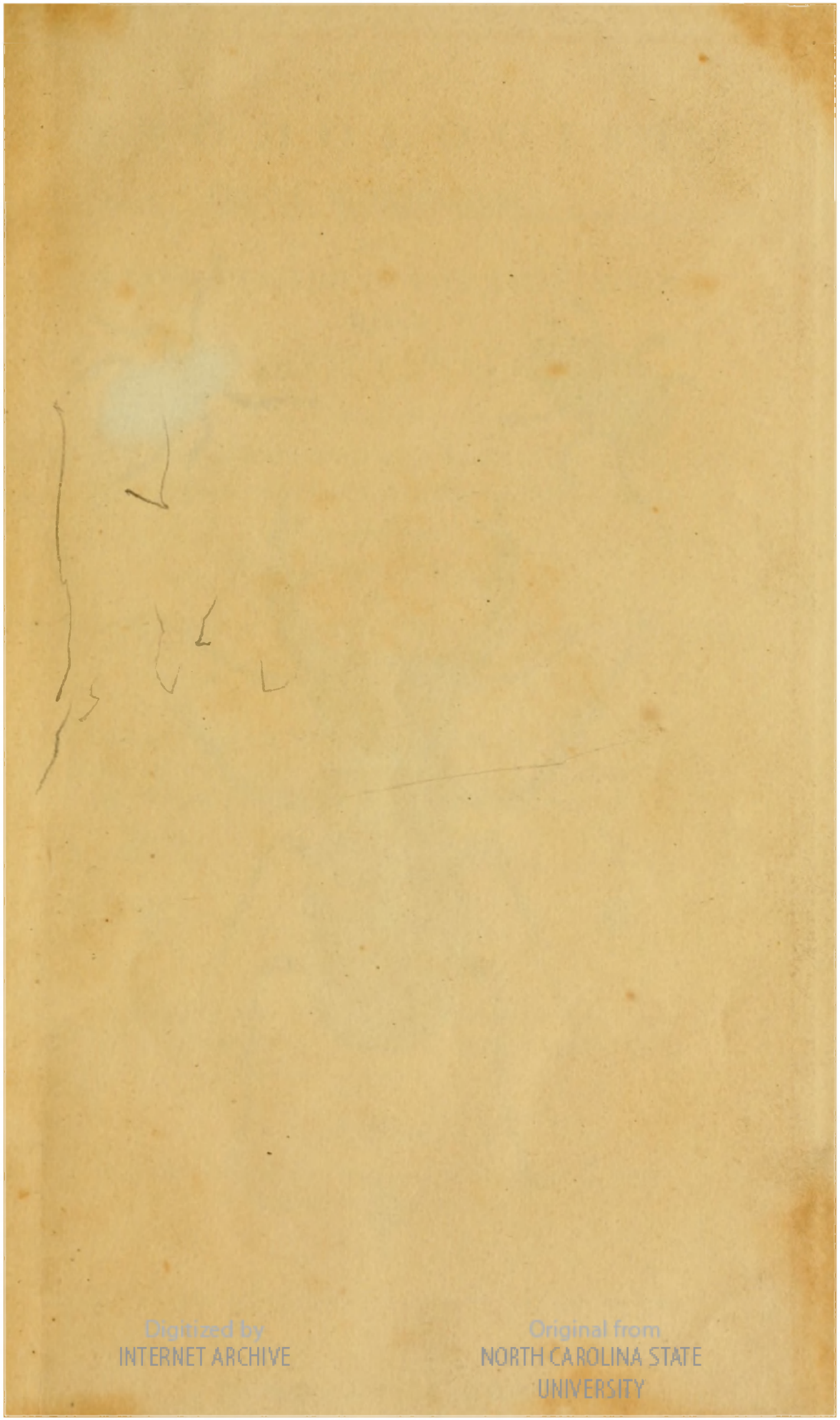

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TO

DR. W. E. LEACH, F.R.S. &c. &c.

SIR,

I may justly dedicate the following pages to you, being indebted for the most valuable part of their contents to your kindness and liberality. I am happy in thus having it in my power to acknowledge my sense of the many obligations which I lie under to you: and at the same time I trust the present work will be the means of aiding you in the very praiseworthy cause in which you are engaged. It is also to be hoped that in England, ere long, Entomology will stand on the same ground with Botany, Chemistry, or Mineralogy; and that your labours will eventually be as duly appreciated in this country as they are now on the Continent.

I remain, Sir, with the greatest respect,

Your most obliged and obedient servant,

GEORGE SAMOUELLE.

Blackfriars Road,
March 1819.

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PREFACE.

It must be acknowledged that the very rapid progress which every science for some years past has made in this country, is greatly to be attributed to Elementary works, and at the same time it is to be regretted that as yet none has appeared on the practical part of Entomology, by which I mean the method of collecting and preserving insects, the elements of the science, &c. It is true such a work is announced, and it is hoped will shortly appear; I allude to the completion of Messrs. Kirby and Spence's Introduction to Entomology.—From the profound knowledge of the subject which these excellent authors possess, we certainly may expect a most complete work; yet its extent, and the necessary expense of at least four octavo volumes, must exclude many from purchasing it, and especially young persons to whom the study of Entomology is particularly adapted.

From this consideration I was induced more than twelve months ago to begin a work, the mere outline of the present, and which was intended to comprise little more than the Linnean Genera, with a slight notice of the more natural Genera which had been separated from them, with references to the best essays or papers that had been published on the subject, and directions for collecting, &c. This was to have been published in duodecimo, and would have made but a thin

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volume. On the return of Dr. Leach from the continent in May I consulted him on the subject, when he most liberally promised me every assistance, with the free use of his books and manuscripts, if I would extend the work. This was a kindness which I certainly did not expect, although I knew his zeal and ardour in the promotion of science: it was also an offer I could not withstand, and which no lover of science will regret. It has been my wish in no instance to omit acknowledging what has been derived from his valuable assistance: should this however have been in any case neglected, I trust that Dr. L. will pardon the oversight.

To experienced scientific Entomologists this work cannot be expected to afford much additional information: their good sense will however admit its necessity and utility, since a publication on such a plan has long been a great desideratum; yet even to these it is presumed it will not be altogether useless, since it contains the characters of many genera lately established by the most celebrated Entomologists on the continent, and never before printed in this country.

The Genera of Linné I have been obliged to give according to my former plan, as the plates were engraved previous to the alteration. The Modern System is nearly the same as that given in the Supplement to Encyclopædia Britannica, article Crustaceology, and Dr. Brewster's Edinburgh Encyclopædia, article Entomology, with the exception of the foreign Genera and the alteration of Tribes to Families terminating in *idæ*.

The introduction of *Objects for the Microscope* may by some be considered as rather foreign to the subject of Entomology; but this I cannot altogether accede to, since the assistance of this instrument is so often required, and many who possess a microscope might be induced to extend their views

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to Entomology if they were acquainted with the method of collecting insects, and were furnished with some work to give them an insight into their distribution and arrangement.

The utility of the *Calendar* must be obvious to every one, as containing extensive and substantial information such as the Tyro will require. Those who reside at a distance from the metropolis have a great advantage, as by carefully examining such places as are referred to in the Calendar they may not only meet with the species enumerated, but are likely to capture new insects, at least undescribed, for as yet very little is known of the Entomology of Britain.

I cannot omit returning my thanks to that acute and excellent Entomologist J. F. Stephens, Esq. F.L.S. whose extensive knowledge of the subject and the readiness with which he has always assisted me deserve my warmest acknowledgement. To Mr. Sowerby also I am indebted for many personal favours.

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THE

ENTOMOLOGIST'S

Useful Compendium.

INTRODUCTION.

ENTOMOLOGY is a study which may be considered as in its infancy. So prone is man to look with contempt on those parts of the creation which are diminutive, that insects have been almost overlooked in his researches after knowledge. His ignorance, the consequence of this contemptuous neglect, has led him to consider the whole class as of small importance, and to arraign the Creator for forming an useless, and in many cases offensive and injurious tribe of beings. Such can be the language only of "haughty ignorance:" the modest observer of Nature, although he may have learned little of the habits, œconomy, and uses of insects, will acknowledge that they have been created with design, and will not doubt but the design was benevolent.

The insect race constitute by far the most considerable portion of animated beings;—in this view the science of Entomology becomes one of the most important and interesting that can engage the mind of the natural philosopher. He who neglects the study of insects, or thinks it beneath his notice, cannot deserve respect as a general observer of nature, nor be considered a scientific naturalist. The views of such a man will be partial, and his inquiries circumscribed: he regards only an inconsiderable portion of animated nature; and he confines his remarks to such as from their size and distinctness of character present the least obstacle to investigation. In the study of Entomology, the man of science will find abundant scope for the exercise of his zeal. The amazing number of species; their curious forms, so infinitely varied, and yet so nearly and gradually approximating through an endless series of transitions from one species to another; the diversity of structure observable in those parts which afford generic characters, added to the wonderful changes in form which they undergo, with their surprising œconomy,—are circumstances which contribute to render them objects of most curious speculation to the philosopher. The study of

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every class of animals is most indisputably attended with peculiar advantages: yet I will venture to affirm, that it is from a knowledge of the characters and metamorphoses of these little animals, and the various modes of life which they are destined to pursue, that he will obtain a more intimate acquaintance with the great laws of nature, and veneration for the Great Creator of all, than can be derived from the contemplation of any other class in nature. The beauty of insects in general, renders them engaging to many who have neither time nor inclination for studying their more complicated structure; and the gaiety of their colours, often combined with the most graceful forms, displays a beauty, splendour and vivacity, greater than that bestowed by the hand of Nature on any of her other works. One *defect* in appearance must indeed be conceded; and this may be regarded, in point of beauty, a material deficiency indeed,—they are not always so considerable in magnitude as to become, even with these embellishments, strikingly attractive. Were they equal in size to the smallest birds, their elegance would render them more inviting to the eyes of mankind in general; but, even amongst the minor species, when examined with a microscope, we find their beauty and elegance far superior to that of any other class of animals in the creation. "After a minute and attentive examination," says Swammerdam, "of the nature and structure of the smaller as well as the larger animals, I cannot but allow an equal, if not superior, degree of dignity to the former. If, whilst we dissect with care the larger animals, we are filled with wonder at the elegant disposition of parts, to what a height is our astonishment raised when we discover their parts arranged in the least in the same regular manner!"

Insects may be divided into two kinds; those which are immediately or remotely beneficial or injurious to mankind. Many insects indeed seem not to affect us in any manner; others, and by far the greater number, most assuredly fall under one or the other denomination, and on this account demand our most serious attention. But, lest the alleged utility of some insects should seem hypothetical to the superficial observer, whilst the noxious effects of others are too obvious to admit of doubt, I shall be more explicit upon this subject. The depredations of insects upon vegetable bodies are often detrimental; but it must be remembered, that in these ravages they often repay the injury they commit. Locusts, the most destructive of all insects, whose numbers spread desolation through the vegetable world, are not (except on some occasions when their multiplication exceeds all bounds) unproductive of advantage. Although they deprive mankind of a certain portion of vegetable food, yet, in return, their bodies afford nutriment of a wholesome and palatable kind, and in much greater abundance. The various species of locusts are the common food on which the inhabitants of several parts of the world sub-

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sist at particular seasons. The honey of bees, in many warm climates, constitutes another primary article of food. The caterpillars of several moths furnish materials for the silken raiment so universally worn by all ranks in the eastern parts of the world; and hence in these countries the silky produce of these industrious little animals is of as much use as the fleecy coat of the sheep is to us. As an object of traffic, silk is one of the utmost importance in China and Tartary; and in those parts paper is manufactured from the refuse of the same material. The extensive use of wax in all ages is well known. Some insects are used with success in medicine; and many others (the cochineal for instance) are rendered useful in the arts: and greater numbers might perhaps be employed for the same purpose. These few, out of a vast many instances, are sufficient to prove the absurdity of an opinion very prevalent, "that insects are too insignificant to deserve the attention of the philosopher." But allowing these benefits to be unknown, and that the study of Entomology is not productive of any substantial advantages, how absurd would it still be to treat such an extensive portion of the creation with neglect! The objection, that they are in nowise conducive to our interests (even if founded in truth), would be no evidence of the frivolity of the science; unless we are to conclude, that the only inquiries which merit our rational attention are those which tend to the gratification of selfishness. If this be admitted as an objection, how many objects of philosophical investigation must be rejected as frivolous! From the earliest period in which the light of natural knowledge dawned, this class of animals has obtained a certain portion of attention: and although the study has not at all times been cultivated with equal ardour, yet it has not been utterly neglected, but has engaged the study of men endowed with talents as splendid, and judgement as refined, as the most exalted of those who affect to treat it with contempt.

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ELEMENTS

OF

ENTOMOLOGY.

So great is the number of natural bodies on the face of our earth, that on a general view the mind recoils at the attempt to investigate them as impossible. But the invention of systems has facilitated the task; and every natural object can be traced by certain characters to its place in the system, whether natural or artificial.

Those who with a philosophical eye have contemplated the productions of Nature, have all by common consent divided them into three great groups; namely, the Animal, the Vegetable, and the Mineral kingdoms.

Animals are distinguished by being organized bodies, which have life, sensation, and are capable of voluntary motion.

Vegetables are organized bodies, which are endowed with a living principle but want sensation.

Minerals are unorganized, without life or sensation.

Zoology, or the study of Animals, is not only the amplest and most difficult, but the most pleasant and profitable part of Natural History. The following is the system of the celebrated Linné.

Division 1. *A heart with two auricles and two ventricles; warm and red blood.*

Class I. Mammalia. Viviparous animals, or such as suckle their young.
Class II. Aves. Oviparous animals. Birds.

Division 2. *Heart with one auricle and one ventricle; cold and red blood.*

Class III. Amphibia. Animals breathing arbitrarily through lungs.
Class IV. Pisces. Animals with gills. Fishes.

Division 3. *Heart with one ventricle, no auricle; white and cold blood.*

Class V. Insecta. With antennæ, and undergoing transformations. Insects.
Class VI. Vermes. With tentacula, and undergoing no change. Worms.

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DEFINITION OF INSECTS.

Insects are so called because they are divided into numerous segments; and not from their being almost separated into two parts, which are merely attached to each other by a slender thread, as is generally supposed.

All genuine insects have six legs; a head distinct from their body, and furnished with two antennæ or horns; and have pores conducting to tracheæ arranged along their sides for respiration: they are all produced from eggs. Some undergo no metamorphosis, others but a partial change, whilst the remainder pass through three stages of existence, after being hatched from the egg.

PARTS OF INSECTS.

An insect may be divided into four parts.

1. Caput. 2. Truncus. 3. Abdomen. 4. Artus.

CAPUT, the *Head*, which is distinguished in most insects, is furnished with *Eyes*, *Antennæ*, and a *Mouth*.

Eyes. Many insects have two crescents or immoveable caps, composing the greatest part of their head, and containing a prodigious number of little hexagonal protuberances, placed with the utmost regularity and exactness in lines crossing each other and resembling lattice-work: these are termed compound eyes.

Leeuwenhoek reckons in each eye of the *Libellula*, or Dragon-fly, 12,544 lenses, or in both 25,088; the pictures of objects painted thereon must be millions of times less than the images of them pictured on the human eye. There is no doubt that insects still smaller have eyes adapted to discern objects some thousands of times less than themselves; for so the minute particles they feed on must certainly be. Besides these larger eyes, many insects have three small spherical bodies placed triangularly on the crown of the head, called *ocelli* or *stemmata* (*Pl.* 10. *fig.* 11. *b*). They are simple, and made for viewing large and distinct objects; the other eyes for small and near ones.

Antennæ. The antennæ are two articulated moveable processes placed on the head: they are subject to great variety, and were the parts from whence Linné formed his genera: they are called

Setaceous, when they gradually taper towards their extremity;

Clavated, when they grow gradually thicker from their base;

Filiform, of an equal thickness throughout the whole of their length;

Moniliform, formed of a series of knots, resembling a string of beads;

Capitate, when they terminate in a knob;

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Fissile, with the knob divided longitudinally into laminæ or plates;
Perfoliate, having the knob divided horizontally;
Pectinate, having a longitudinal series of hairs or processes projecting from them in form of a comb;
Furcate, or forked, having the last joint divided into parts.

Nothing has been the source of greater speculation than the *use of the antennæ:* nor is this surprising, considering the variety constantly exhibited in their structure, occupation, and appearance. Some insects seem to keep them in continual employment; in others they are preserved in a quiescent state. Those of the ichneumon show an incessant tremulous vibratory motion, anxiously searching into every crevice; while those of the carrion-fly scarcely appear endowed with flexibility. They have successively been considered as the organs of hearing, feeling, smell, and taste, or of an unknown and indefinite sense.

Bonnet seems to think the antennæ the organ of smell. "Different insects," he observes, "have an exquisite sense of smelling, the organ of which is yet undiscovered. May it not reside in the antennæ?" Lehmann, from the result of experiments on this subject, denies that the antennæ are the olfactory organ. He made an opening an inch wide in the side of a glass vessel, and surrounded the edge with wax, so that a close covering could be applied. An aperture was made in this covering, through which either the whole head, or the antennæ only of an insect could be introduced. By means of a tube the glass was filled with penetrating odours, vapours, or heated air; but neither the fumes of sulphur nor burnt feathers produced the smallest effect on butterflies, bees, or beetles, whose antennæ were exposed to them. He judges that the olfactory organ must be sought in the spiracula; "for what else," says he, "is the sense of the particles inspired than smelling?"

Bonsdorf, in discussing whether the antennæ may be the seat of hearing, mentions an experiment where a species of beetle, whose peculiar property it is to fold in the antennæ when alarmed, did so on a loud noise being suddenly made, and fell to the ground, according to the nature of the species. But, notwithstanding that the animal previously reposed in a tranquil state, his experiment cannot be considered altogether conclusive. Butterflies are seen to erect their antennæ on any sudden noise, and many *Coleoptera* to depress them; which may equally arise from the sudden shock or vibration of the air. Spiders also, which want antennæ, are extremely sensible of sound. Lehmann relates that, on observing one descend from the roof by its thread in quest of a female, while he was reading, he began to read aloud: the animal, alarmed at the noise, retreated upwards; he was silent, and it returned; on again reading aloud, it testified alarm and ascended its thread; nor was its apprehension of danger dispelled, until familiarized with the sound or conquered by the object of its

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pursuit. The same author deprived crickets, which are animals noted for acuteness of hearing, of the antennæ; yet they were equally sensible of sound as before. Lehmann concludes on the whole, that as the antennæ are not the organs of either smell or hearing, their principal though not sole office is feeling. But they are also endowed with an unknown sense, which he denominates *aeroscepsin*, and conjectures that in certain species they may contribute to the defence of the head.

Huber, well known for his ingenious and acute observations on bees, has made several most interesting experiments on the subject. Amputating one of the antennæ of a queen he found was not attended with any perceptible effect. Privation of both antennæ, however, produced very singular consequences. M. Huber cut them from a queen whose fecundation had been retarded, so that she laid none but the eggs of males. From that moment a marked alteration in her conduct was seen; she traversed the combs with extraordinary rapidity, scarcely had the workers time to recede before her; and, instead of the care which a perfect queen displays in depositing her eggs in those places alone suitable for their exclusion, she dropped them at random without selecting proper cells: she retired to the most solitary parts of the hive, seeming to avoid the bees, and long remained motionless. Several workers, however, followed her there, and treated her with the most evident respect. She seldom required honey from them; but when that was the case, she directed her trunk with a kind of uncertain feeling, sometimes on the head and sometimes on the limbs of the workers; and if she did reach their mouths it was by chance. Queens leave their hive but once in their whole lives, which is for the purpose of obtaining impregnation; they remain voluntary prisoners ever afterwards, unless in leading out a swarm. This queen, however, seemed eager to escape; she rushed towards the opening of the hive, but finding it too small for her exit she returned after fruitless exertion. Notwithstanding the symptoms of delirium by which she was agitated, the workers never ceased to pay her the same attention as they invariably do their queens, though she received it with indifference.

Apprehensive that the queen's instinct might be impaired, from her organization suffering by retarded fecundation, M. Huber deprived another female of the antennæ, and introduced her into the hive. She was quite in the natural state, and had already proved of great fertility: but now she exhibited exactly the same symptoms of agitation and delirium that the other had done. Perfect queens, possessing all their organs, testify the most violent animosity against each other; they fight repeatedly; the workers seem to incite them to combat, until one at length falls, while the other survives to preserve and perpetuate the colony. Mutilated of the antennæ, however, they testify no reci-

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procal aversion; in traversing the hive they meet without showing the smallest indications of resentment. If a perfect stranger queen is introduced, either when one already exists in a hive or within a few hours after she is lost, that stranger is immediately surrounded, and so closely hemmed in by the bees that she sometimes dies. But here the mutilated stranger was quite well received; her arrival created no discontents in the hive, and the workers paid the same homage to her as to their own. "Was it," asks M. Huber, "because after losing the antennæ these queens no longer retained any characteristic which distinguished the one from the other? I am the more inclined to adopt this conjecture, from the bad reception experienced by a third perfect queen introduced into the same hive: it is probably because they observe the same sensations from those two females, and want the means of distinguishing them from each other." Bees never abandon their queen; her presence seems almost indispensable to their existence; and, as before observed, the queen never forsakes her hive. If she does so to found a new colony, the bees accompany her in her flight. Here, as both the mutilated queens constantly endeavoured to escape, the first and third were removed, and the entrance of the hive enlarged; the fertile mutilated one therefore left it, but none of the workers followed her; she was allowed to depart alone. The wise provisions of nature are amply illustrated by these facts. It is fortunate that a queen deprived of the antennæ is thus impelled to leave the hive: while she remains, the bees incessantly attend her, and never think of procuring another. The secret which the workers possess, of converting a common worm into one, which will become a queen, must be exercised within the first three days of its existence; therefore if the queen remained, this limited term would elapse. Neither can her presence contribute to preserve the hive; for mutilation of the antennæ deprives her of the power of discriminating the different kind of cells adapted to receive the various species of eggs which she lays. M. Huber considers the antennæ as the organs of touch or smell, though he declines affirming which of these senses resides in them; and thinks it possible that they may be so organized as to fulfil both functions at once.

Mr. Kirby, in speaking of the *Eucera* (or long-horned bee), says: "A singular circumstance distinguishes their antennæ, which, to the best of my knowledge, has never before been noticed, and which may possibly lead to the discovery of the use of these organs. Placed under a powerful magnifier, the last ten joints appear to be composed of innumerable hexagons, similar to those of which the eyes of these insects consist. If we reason from analogy, this remarkable circumstance will lead us to conjecture, that the sense of which this part so essential to insects is the organ, may bear some relation to that conveyed by the eyes. As they are furnished with no instrument for

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receiving and communicating the impressions of sound, similar to the ear, that deficiency may be supplied by extraordinary means of vision. That the *stemmata* are of this description seems very probable; and the antennæ may, in some degree, answer a similar purpose: the circumstance just mentioned, furnishes a strong presumption that they do this, at least in the case of these males; else why do they exhibit that peculiar structure which distinguishes the real eyes?"

Mr. Marsham observed the *Ichneumon Manifestator*, in June 1787, on the top of a post in Kensington Gardens. It moved rapidly along, having its antennæ bent in the form of an arch; and, with a strong vibratory motion in them, felt about until it came to a hole made by some insect, into which it thrust them quite to the head. It remained about a minute in this situation apparently very busy, and then, drawing its antennæ out, came round to the opposite side of the hole, and again thrust them in, and remained nearly the same time. It next proceeded to one side of the hole, and repeated the same operation there. Having now again withdrawn its antennæ it turned about, and, dexterously measuring a proper distance, threw back its abdomen over its head and thorax, and projected the long and delicate tube at its tail into the hole. After remaining near two minutes in this position, it drew out the tube, turned round, and again applied its antennæ to the hole for nearly the same time as before, and then again inserted its tube. This operation was repeated three times; but Mr. Marsham approaching too near, in order if possible to observe with a glass what was passing in the tube, he frightened the insect entirely away.

About a week afterwards Mr. Marsham was in Kensington Gardens, and saw several of these ichneumons at work. They appeared to pierce the solid wood with their tubes, which they forced in even to half their length, constantly passing them between the hinder thighs, which they closed in order to keep the tubes straight, when over resistance would otherwise have forced them to bend. It appeared truly surprising to see an instrument, apparently weak and slender, able, with the strength of so small an animal, to pierce solid wood half or three-quarters of an inch deep; but, on particular attention, it was discovered, that all those that appeared to pierce the solid wood, did it through the centre of a small white spot resembling mold or mildew, which on minute examination was found to be fine white sand, delicately closing up a hole made by the *Apis maxillosa*, and where, no doubt, there were young bees deposited.

In deep holes that were not closed, the insect not only thrust in the whole tube, but in some cases the whole of the abdomen and posterior legs, leaving out only the two fore feet and wings, which it placed in contrary directions, like arms. The two cases of the tube were also projected up the back, with the ends appearing above the head out of the hole.

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From Mr. Marsham's account it appears that these insects do not adopt any hole indiscriminately as a situation for their eggs; for in many instances he saw them thrust their antennæ into holes and crevices from which they almost immediately withdrew them, and proceeded in search of others. As the whole of the ichneumons deposit their eggs in the body of some other creature as a nidus, it appears probable that in these instances they found the holes empty, and that they went on in search of those in which the young of the *Apis maxillosa* were deposited.

From these remarks may we not infer that the antennæ may be the organs of smelling? for the antennæ of the *Ichneumon Manifestator* (*Pl.* 8. *fig.* 4.) are not so long as the tube from which the eggs are excluded, and consequently could not have touched the animal in which it afterwards deposited its eggs. In many species of *Lepidoptera* the females are destitute of wings: the males in general have pectinated antennæ, and are so extremely eager after the female, that they have been known to enter the pocket of an entomologist who had one secured in a box.

These experiments are in some measure corroborated by the observations of Latreille, who supposes the antennæ to be the olfactory organs. In the twelfth number of the Edinburgh Review is a critique (on the *Nouveau Dictionnaire d'Histoire Naturelle*, 24 tom. 8vo. Paris, 1803-4.): the following extract I here insert, hoping it will produce a further inquiry.

"That insects possess the faculty of smelling is clearly demonstrated. It is the most perfect of all their senses. *Beetles*, of various sorts, *Nitidulæ*, the different species of *Dermestes*, *Sylphæ*, *Flies*, &c., perceive, at a very considerable distance, the smell of ordure and dead bodies, and resort in swarms to the situations in which they occur, either for the purpose of procuring food or depositing their eggs. The blue flesh-fly, deceived by the cadaverous odour of a species of *Arum*, alights on its flower. But though we can thus easily prove the presence of the sense of smell among insects, it is much more difficult to discover the seat of that particular sense. Several naturalists have supposed that it resides in the antennæ. Duméril, in a dissertation published in 1799, attempts to prove that it must be situated about the entrance of the stigmata or respiratory organs, as Baster had previously supposed. His arguments, however, did not induce Latreille to relinquish the former opinion, which places it in the antennæ. The following are the reasons which he assigns for his belief.

"1. The exercise of smell consists only in the action of air, impregnated with odoriferous particles, on the nervous or olfactory membrane, which transmits the sensation.

"If insects be endowed with an organ furnished with similar nerves, and with which air, charged with odoriferous particles, comes in con-

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tact, such an organ may be regarded as that of smell. Should the antenna present a tissue of many nerves, what inconvenience can result from supposing that this tissue is capable of transmitting odour? Would not this hypothesis, on the contrary, be more simple and more consonant to anatomical principles, than that which fixes the seat of smell at the entrance of the stigmata? Besides, this last mode of explanation will not, I presume, suit the crustaceous animals, which so nearly approach to insects.

"2. Many male insects have their antennæ more developed than the females; a fact easily explained, if we admit that these organs are the seat of smell.

"3. It is certain that most of those insects which live or deposit their eggs on putrid animal or vegetable matters, stagnant waters, or any substance, in short, which, for a time, affects peculiar localities, are almost uniformly distinguished by a greater development of the antennæ. Such, for example, are the *Scarabæus*, *Dermestes*, *Silpha*, *Clerus*, *Tenebrio*, *Tipula*, *Bibio*, *&c.* These require a more perfect sense of smell, and are organized accordingly.

"4. A great many insects which are entirely predaceous have simple antennæ; and those which are characterized by similar manners, and which are sedentary, have none at all; as, for instance, the *Acari*, and a considerable portion of Lamarck's *Arachnidæ*.

"5. Insects discover their habitation and food by the sense of smell. I have deprived several insects of their antennæ, when they instantly fell into a state of stupor or derangement, and seemed to be incapable of recognising their haunts or their food, though just beside them. Such experiments deserve to be prosecuted. I would recommend, for example, the varnishing or covering the antennæ of dung beetles, and placing them near animal excrements, of which they are particularly fond, to observe if they would repair to them as usual.

"6. The nerves terminate at the antennæ; and their articulations, though externally covered with a pretty thick membrane, are hollow, lined within by a soft substance, which is often of a watery consistency, and whose extremity, when opposed to the air, may receive its impressions."

Os, the *Mouth*. In order to afford some idea of the amazing difference that prevails in the structure of the several parts or organs which constitute the mouth, it will be only requisite to observe, that the classification of all insects in the Fabrician system is founded on this character. There are ten principal parts of which the mouth consists; and it is from the relative proportion of each, from the dissimilarity in the form, position, variation in number, or occasional peculiarities, that the most permanent characters are deduced. These parts have one disadvantage; they are generally small, and from this circumstance have not been so universally adopted in the arrangement

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of insects as they would otherwise have been. Without, however, bestowing some little attention on these organs, it is impossible to distribute insects into their natural order with any great degree of certainty. In the works of Latreille, Leach, and most other modern writers on Entomology, the essential characters are established chiefly on the peculiarities of these organs.

The ten principal parts of which the Mouth consists are the following.

Labrum, or Labium, superius, the *Upper Lip:* a transverse, soft, moveable piece, of a coriaceous or membranaceous nature, known from its situation at the anterior or upper part of the mouth. This part is very distinct in many of the *Coleoptera*, and in *Gryllus*, *Apis*, and some other genera. Linné sometimes confounds the upper lip with the *clypeus* or shield of the head; and similar instances occur in the works of Fabricius. These two parts may be distinguished by one invariable character; the *clypeus* is fixed, and forms a portion of the head; the upper lip is moveable, and is placed more forward.

Labrum, or Labium, inferius, the piece which terminates the mouth beneath, and which is sometimes lengthened so as to form the instrument called *ligula*. It is often bifid, and has the posterior pair of feelers placed at the base.

Mandibulæ, *Mandibles:* (*Pl.* 10. *fig.* 1. *d.*) two hard pieces, in substance resembling horn, which are placed one at each side of the mouth, below the upper lip. These have a lateral motion, while the upper and lower lip move up and down, as in other animals. These differ from the *maxillæ*, with which they are sometimes confounded, by not having any of the *palpi* or feelers attached to them. In rapacious insects these are longer than in those which perforate wood; and the latter again have stronger mandibles than insects which feed only on herbage or leaves.

Maxillæ (*Pl.* 10. *fig.* 1. *e.—fig.* 2. *a. the same magnified*): two small pieces generally of a somewhat membranaceous consistency, and in figure different from the mandibles. These are commonly indented at the extremity, and nearly all ciliated at the inner edge. They are placed under the mandibles, and above the lower lip; their motion is lateral. In those insects which have more than two pair of feelers, the posterior ones take their origin from the sides of the maxillæ. (*fig.* 2. *b. c.*)

Galeæ, *Shields of the Mouth:* two membranaceous appendages, usually of a large size and cylindrical form, placed one on each side, at the exterior part of the jaw, and which cover and protect the organs of the mouth conjointly with the lips. The *galeæ* are inserted at the back of the jaws, as is well exemplified in the *Gryllus* tribe.

Ligula. This is the part considered by many authors as the lower lip: its situation is immediately under the jaws; and it consists of a single piece, which is generally of a soft texture, often bifid, and, if at-

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tentively examined at the base, will be frequently found of a horny substance.

In the *Coleoptera*, and in some of the *Hemiptera* (as in *Blatta*, *Gryllus*, *&c.*), this appendage terminates at the point in a membranaceous substance:—its form is extremely various in the different genera. The *Hymenoptera* and some *Neuroptera* have the *ligula* situated in the same manner; but it is in these concave, and is frequently prolonged into a sort of *proboscis*, which sometimes exceeds the length of the whole body. It is membranaceous, but of a soft and spongy texture, and well suited for receiving the impressions of taste. This kind of process is extremely well exemplified in the bee.

Lingua, the *Tongue*: an involuted tubular organ, which constitutes the whole mouth in lepidopterous insects. This is of a setaceous form, and either very long, as in the *Papilio* and *Sphinx* genera; or short, as in most of the *Bombyces* and other moths. It consists of two filamentous pieces, which are externally convex, concave within, and connected longitudinally by a suture along the middle above and beneath. These, in uniting, form a cylinder, through which the nectareous juices of the flowers on which these insects subsist are drawn up with facility. These two pieces are not very closely united, and may be separated by means of a needle point. When the insect takes its food, this tube is exserted; at other times it is rolled up spirally between the *palpi*.

Rostrum, or *Beak*: the part which forms the mouth in many of the hemipterous order of insects. This instrument is moveable, articulated, and bent under the breast. Within, this beak is hollow, and contains, as in a sheath, three or more very fine and delicate bristles, the points of which these insects introduce into the body of the animal, or substance of the plants, from which they draw nourishment. The rostrum is conspicuous in the genera *Cicada*, *Nepa*, and *Cimex*.

Proboscis, the *Trunk*: inserted in the place of the mouth in most dipterous insects. It is rather fleshy, retractile, of a single piece, and often cylindrical; the end forming two lips, which are of a soft substance, and from the delicacy of their teguments must possess the faculty of taste in a very high degree. Example in the House-fly.

Lingua, *rostrum*, and *proboscis*, are Linnean terms; and are adopted according to the definition of that author. *Ligula* is a Fabrician expression, indicating a process of the lower lip.

Haustellum: formed of two or more very small and delicate filaments, inclosed in a sheath of two valves.

Palpi, *Feelers*. These are the small, moveable, filiform organs or appendages, placed at each side of the mouth in the generality of insects. In some respects they resemble the antennæ, but are more distinctly articulated. They vary in number in different insects, being either two, four, or six, (*Pl.* 10. *fig.* 1. *f. f. and g.*) and are commonly inserted at each side the exterior part of the jaw. In those which have

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only one pair, they are usually situated on the upper lip; when two or more, the posterior ones are generally on the lower lip; and in some insects furnished with a sucking trunk, they are oftentimes found inserted at each side of that organ. These feelers are composed of several joints, the number of which vary. Like the antennæ, to which they bear analogy, they are endowed with powers of motion, but still more extensively. They also serve, like the antennæ, as an essential character in the construction of genera; and from their situation, the number of joints, termination, and relative proportion and size, are exceedingly useful for that purpose.

FRONS, the *Front*: the anterior or fore part of the head, the space between the eyes and the mouth.

CLYPEUS, *Shield of the head* in coleopterous insects: the part corresponding with the front of the head in the other orders. In the beetle kind it is advanced more or less upon or over the mouth, and in some forms a sort of cap, the rim of which extends so far over the head as to conceal the mouth beneath. The anterior edge of the *clypeus* is sometimes mistaken for the upper lip.

VERTEX, the *Crown or summit of the Head.*

GULA, that part which is opposed to the front of the head, usually called the *Throat.*

TRUNCUS, the *Trunk*: the second principal division of which an insect consists, comprehending that portion which is situated between the head and the abdomen. The trunk includes the *Thorax*, *Collar*, *Sternum*, and *Scutel.*

THORAX: a term indefinitely applied sometimes to the whole trunk, the scutel excepted: in a stricter sense it implies only the dorsal part of the trunk, and may be considered as expressive of that portion of the superior surface which lies between the head and the base of the wings. The appropriation of suitable terms, by which a thorax consisting of one or of several pieces may be discriminated from each other, is desirable. In some the thorax is of a single piece, as in the orders *Coleoptera* and *Hemiptera;* in that of *Lepidoptera* it comprehends several segments, and a similar structure is still more conspicuous to view in the order *Hymenoptera.* The first or *anterior segment* of the thorax, in those consisting of several pieces, has been sometimes called the collar; but in admitting this, the coleopterous and hemipterous orders of insects can have no thorax. This will be rendered plain, when we consider that in the latter kinds of insects the first pair of legs arises from what is usually understood by the lower surface of the thorax; the interior segment, in hymenopterous insects, corresponds with the whole thorax in the former, for the first pair of legs arises from it in exactly the same manner. In the former, the thorax of a single piece is immediately succeeded behind by a *scutel*, while in

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the *Hymenoptera* and *Lepidoptera* a large plane of one or more joints intervenes between the true thorax and the scutel; and it is to this last-mentioned dorsal space that the term *thorax* is assigned. Hence it is evident that the language of Entomology in this point is not altogether consistent; because what we denominate the collar in *Hymenoptera*, is the thorax in *Coleoptera;* and in *Coleoptera* we find nothing analogous to the *thorax* of the other order, except the collar.

The thorax in those insects which have that part consisting of a single piece, or the first segment in such as are of a compound nature, has the first pair of legs arising from the lower surface, and it is in this part that the muscles which move the head as well as this pair of legs are said to be contained. The thorax in different kinds of insects varies considerably in form, and affords very excellent generic and specific distinctions. Some are armed with spines, others denticulated, marginated, &c.

Pectus, the *Breast*, is the third segment of the body, or that to which the four posterior feet are attached, and which is longitudinally divided at the anterior part of the *sternum*. The wings in lepidopterous and most other insects have their origin or base in the superior part of the breast. The wings and elytra in the *Coleoptera* and *Hemiptera* deviate a little from this, as they are placed more immediately on the back than in a lateral position; the breast contains the muscles that move the wings and give action to the four posterior legs. This part is capable of being compressed and dilated, the alternate motion of which is very evident in some insects of the butterfly or moth kind when held between the fingers. The power of compression and dilatation is supposed to arise from the action of some very strong muscles, being reddish yellow, and extremely loose. It has been conjectured that these muscles may assist the motions of the organs of flight.

Sternum, or *Breast-bone*. By this term entomologists define that portion of the middle part of the breast which is situated between the base of the four posterior legs. This piece terminates in some insects anteriorly in a somewhat acute point; in others it appears rather bilobate; and in the far greater number ends obtusely or in an obtuse lobe. There are few insects in which the *sternum* is remarkable, either from its magnitude or figure. In some of the coleopterous tribes, as in the *Hydrophili* and *Dytici*, this part is most conspicuous.

Scutellum (Linné), the *Scutel* or *Escutcheon*: the lobe-like process situated immediately at the posterior part of the thorax in the scutellate insects. The *scutel* is not of the same form in all insects, yet its general tendency is towards a sub-triangular figure. In the coleopterous tribes it approaches nearest to this form; its deviations incline more or less to heart-shaped, with the tip pointing backwards. The same figure prevails in some of the *Hemiptera*. In the *Neuroptera*, *Hymenoptera*, and

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Diptera, the triangular contour is still more observable under various modifications, and most commonly with the posterior tip rounded off. Sometimes, as in several of the hymenopterous insects, the posterior end is armed with spines or denticulations; this is, however, not usual. The *scutel* in the far greater number of insects, whether terminating in a point or rounded, is commonly unarmed. In point of size the *scutel* is more variable than in figure: in some it is so small as almost to escape notice, merely forming a point at the extremity of the thorax, as we observe in certain kinds of the beetle tribe; in others it is very conspicuous, being sometimes so large as to cover the middle of the back; and in others, as the scutellate kinds of *Cimices* and a few of the genus *Acridium*, it expands over the back, entirely concealing the wings and wing-cases, and covering the margin of the abdomen.

ABDOMEN. The third principal division, or posterior part of the body, is connected with the breast, either closely or at a distance, by means of a fillet. The abdomen is composed of annular joints or segments, the number of which vary in different insects. The upper part of the abdomen is called by entomologists, *tergum;* the inferior or belly, *venter*. The opening at the posterior part of the abdomen is the vent; and the extremity in most insects contains the organs of generation: there are exceptions to the latter.

The total movement of the abdomen is not very obvious, except in insects which have that portion of the body pediculated, as in many of the hymenopterous genera. It has then a real joint, in which the first annulation is indented above, and receives a projecting process from the breast, on which it moves. This joint is rendered secure by elastic ligaments, which have a considerable degree of force. Some muscles which arise within the breast are inserted into the first ring, and determine the extent of its motions. The partial motion of the ring is produced by very simple muscles, consisting of fibres which extend from the anterior edge of one ring to the posterior edge of that which immediately precedes it. When the dorsal fibres contract, the superior part of the abdomen being shortened, it turns up towards the back; but when the contraction takes place in the ventral or lateral fibres, the abdomen is inflected towards the belly, or directed towards one of the sides. The extent of the motion, however, depends on the number of the rings and their mode of junction. In the *Coleoptera*, for example, the rings only touch each other by their edges, and the motion is very limited; but in the *Hymenoptera* they are so many small hoops, which are incased one into another like the tubes of a telescope, so that scarcely half, and sometimes not above one-third, of their extent appears visible externally.

The form, connexion, proportion, and appearance, of the surface of the annulations of the abdomen, afford numberless specific distinc-

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tions; and so likewise do the appendices at the extremity of the abdomen.

The abdomen contains the intestines, the ovary, and part of the organs of respiration: it is affixed to the thorax, and in most insects distinct from it, forming the posterior part of the body.

Cauda, the *Tail.* An appendage of any kind terminating the abdomen is usually denominated the tail. These appendages vary in figure considerably in different insects, and many tribes are totally destitute of them. They are supposed to be destined to direct the motion of the insect in flight, to serve for its defence, and for the deposition of its eggs. In some insects this tail is simple, and yet capable of being extended and withdrawn at pleasure; in others elongated. Some are setaceous or bristle-shaped, as in the *Raphidia.* Those termed *triseta* have three bristle-shaped appendices, as in the *Ephemera.* In some it is forked, as in *Podura.* When it terminates in a pair of forceps it is called *forcipata.* In the *Blatta* and others it is *foliosa,* or resembling a leaf. In the *Panorpa* it is furnished with a sting, and is called *telifera:* this last may be more properly referred to the next.

Aculeus, the *Sting:* an instrument with which insects wound and instil a poison. The sting generally proceeds from the under part of the last ring of the belly: in some it is sharp and pointed, in others serrated or barbed. It is used by many insects both as an offensive and defensive weapon: by others it is used only to pierce wood, or the bodies of animals, in order to deposit their eggs. In wasps and bees the sting is known to be retractile. In some insects it exists in the male only, and in others nature has provided the female alone with this instrument: it is not frequently met with in both sexes of the same species, and the far greater number of insects have no such organ.

ARTUS, the *Members.*

Pedes, the *Legs.* In all insects the legs amount to six, and never exceed that number; and the same is observable of the true feet in the larvæ of those insects; the latter have spurious feet to a greater amount, but the true feet do not exceed six.

The leg of an insect may be divided into four, or more correctly into five, parts: *Coxa,* the first joint or haunch, at the base; *Femur,* the thigh; *Tibia,* the shank; *Tarsus,* the foot; and *Unguis,* the claw. Each of these parts is enveloped in a hard case of a horny substance, and varies in shape in different insects, the form of the feet in all the kinds being admirably adapted to their mode of life and convenience of their motion. From the different conformations of these limbs it is easy to recognise, even in the dead insect, the mode of life which the species is destined by nature to pursue. Those which have the legs adapted for running or walking have them long and cylindrical: the thighs of the

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leapers are remarkably large and thick, with the shank long and commonly arched, by which means they possess great strength and power for leaping: the legs are broad, serrated, and sharp at the edges, in those accustomed to dig in the earth; and such as are of the aquatic kind have the legs, especially the posterior pair, long, flat, and ciliated, or fringed at the edge with hair. The leapers are well exemplified in the saltatorial kinds of *Curculio* and *Chrysomela;* and the swimmers, in the genera *Hydrophilus* and *Dyticus*.

The Coxa, a small joint at the base, connects the thigh to the body, and moves in a corresponding cavity of the collar or thorax in the first pair, or breast in the two posterior ones. This part varies in form: in the *Cerambices*, *Coccinellæ*, and other insects in which the feet serve for walking only, its shape is globular: such as require that the feet should have a lateral motion, and which is necessary to those that dig into the earth, have the coxa broad and flat; this is also observable in some of the aquatic beetles: in the *Dytici* the coxa of the posterior legs is imbedded in the trunk, and in the *Blatta*, *Lepisma*, and others which walk very rapidly, it is compressed into a lamellate form.

Femur, the *Thigh*. There is more diversity in the form of the thigh than the coxa to which it is united. The articulation of these two parts is internal, and is produced in such a manner that when the animal is in a state of repose it is parallel to the inferior surface of the body. It is limited to a forward and backward motion with respect to the first piece. The nature and extent of the motions of the thigh appear to determine its form. In those insects which walk much and fly little, as in the *Carabus*, &c. the thigh has two little prominences at the base called *trochanters*, which appear to be intended for removing the muscles from the axis of the articulation. Those which require strong muscles adapted for leaping, have the thigh not only thick but generally elongated; as in the *Gryllus* and *Locusta* tribes, the *Pulices* or fleas, &c. And in the *Aphodius*, *Geotrupes*, &c. (*Scarabæi* Linn.), and also the mole cricket, (all which burrow in the earth,) the thigh is moved with much force, and has an articulated surface corresponding to the flat part of the coxa on which it rests. This part is sometimes spinous.

Tibia, or *Shank*, is the third joint of the legs, and moves in an angle according to the direction of the thighs. The figure of this part depends essentially on the uses to which the habits of the insect require it to be applied: in the natatorial kinds it is usually flat and ciliated—at least the *tibia* of the posterior pair; and in many others, as in a variety of the burrowing kinds of beetles, it is serrated. The shank is more frequently serrated or spinous than the thighs.

The Tarsus, or *Foot*, is the fourth joint or last portion of the leg except the claw. This part consists in general of five joints: this is usually the number in the *Coleoptera*, *Hymenoptera*, and *Diptera*. In some of these, however, and also in the *Hemiptera*, there are only four

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articulations in this part of the leg, as we observe in *Cerambyx*, *Gryllus*, and others: in *Libellula*, *Forficula*, &c. three: in the anterior feet of *Nepa* only one. The figure of the tarsus is more variable than any other portion of the leg, and is in a most singular manner adapted to the insect's mode of life. The articulations in such as walk on the surface of the earth are slender; those which burrow have them more robust. Many of those which inhabit waters have them flat and ciliated at the edges, as in the *Hydrous*. Others are furnished with bristly tufts or vascular fleshy tubercles, which enable them to move with security on smooth and slippery bodies in any direction: an admirable example presents itself in the common house-fly, which "treads the ceiling, an inverted floor," with the same facility that other insects walk on the surface of the ground. An occasional difference in the number and form of the joints of the tarsus is sometimes observed in the two sexes of the same species. The motion of each joint of the tarsus is performed in a single plane, and is directed by two muscles in each joint, one of which is small and placed on the dorsal surface, the other larger and situated beneath.

Unguis, or *Claw*, the termination of the tarsus. In the greater number of insects there are two claws attached to each tarsus: some have only one; and in others furnished with two there is an intermediate process, forming by this means three. An appearance similar to this is seen in the legs of the *Lucanus;* but this on minute examination is found to be a distinct joint also, armed with a pair of claws precisely resembling those which more obviously, from their size, appear to terminate the tarsi. It is considerably smaller, but is perfectly well defined.

Alæ, or *Wings:* the organs appropriated to flight. These are either two or four, and are attached to the lateral part of the breast close to the lower margin of the thorax. They are placed to an equal amount and in a corresponding situation on both sides of the insect, whether the number be two or four. Those insects which are furnished with only one pair of wings have in these organs both an uniform appearance and size. Such as have two pair most frequently differ, the first being larger than those behind: there is also a difference in shape, and very commonly a considerable variation in the spots, markings, and other particulars, notwithstanding the prevailing hues in all the wings may be the same. In general the posterior pair is paler, and the marks obscure.

A skeleton of nervures, (which are considered in the light of bones by Dr. Leach, who has named them *Pterigostia* or *Wing-bones*, and are parts more or less numerous and differing exceedingly in disposition,) placed between two thin and closely united membranes, constitutes the true wing in insects. This conformation is very

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clearly exemplified in that description of wings which is usually termed transparent, as in the common house-fly and the bee. The true wing, by means of which the insect is enabled to fly, is always constructed in this manner, whatever may be its appearance externally, arising from a superficial covering of down, feathers, hair, or any other cause. The variety in the form and structure of the wings, in the number, figure, and disposition of the nervures, or the colours with which they are adorned, is infinite. The diversity in the disposition of the nervure is evident from a comparison of the simply constructed wing of the common house-fly with the complex wing of the *Panorpa* or the *Ephemera*, or the wings of an earwig, which consists of a series of single nervure, with the elaborately wrought lattice-work of the wing of the *Libellula*. The whole of the lepidopterous order exhibit the superficial coating of feathers, down, or hairs; and upon the removal of these the wings are found constructed in the same manner as the transparent wings of the other orders. A variation in the form of the wing as well as its texture is manifest throughout all insects of the winged kind. Those of the *Coleoptera* have two membranaceous wings, which fold upon each other, forming a plait or double at their external margin, which fold is accommodated by a peculiar joint in the main rib of the wing, and the disposition of the nervures in the middle of the wing contiguous. In the *Hemiptera* the wings generally fold longitudinally, without any transverse double; so that in expansion these parts open somewhat like a fan. The anterior wings of the *Lepidoptera* are neither doubled across nor folded longitudinally; they are entirely flat, and are but little capable of contraction and dilatation. In the genus *Papilio* they are endowed with the power of erection, which is rarely the case in the *Phalænæ*, though occasionally observed among the *Sphinges;* the *Phalænæ* have the lower wings concealed under the anterior pair, the latter being laid in a flat position over them. The wings of the *Lepidoptera* are downy, and often decorated with very beautiful colours disposed in the most pleasing and varied manner. The *Neuroptera* in general have the wings flat; this is not invariable; they are constantly membranaceous, and reticulated with nervures. In the *Hymenoptera* the wings are membranaceous, generally flat, but sometimes folded when the insect settles, as in the wasp genus. The *Dipterous* order cannot be confounded with the preceding, as they have only two wings: they are membranaceous as in the former.

In all insects of the winged kind these organs present the greatest diversity, and afford characters both for genera and species less liable to fluctuation than common observers would conceive. The number, figure, construction, proportion, consistence, and texture of the wings have enabled naturalists to distribute insects into principal groups with considerable precision. Linné derived much assistance from an

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attention to these parts; later writers have in many instances regarded them more closely; and in the further progress of the science these parts will be consulted with still greater advantage.

Elytra, or *Wing-cases*, appertain to the coleopterous order. These are two in number, of a substance resembling leather; for the most part moveable, and opening by a longitudinal suture along the middle of the back. These wing-cases or sheaths are often confounded with the wings; but they are really not wings from their structure or substance, nor do they answer the purpose of flight; they merely open to afford the true wing, concealed beneath, the power of expansion and motion, and close down upon the wing when the insect is at rest, to preserve it from injury. Some *Coleoptera* have the elytra united.

The superior surface of the elytra is more or less convex, and the lower surface correspondently concave: the texture in some, as in many of the *Curculiones* and *Cerambyces*, is so hard that it is pierced with difficulty by means of a strong pin; in others so flexible that they spring into their proper form immediately after being bent double. The proportions of the elytra compared with the body are various; their form dissimilar; and the diversity of their surface—arising from dots raised or depressed, protuberances, flutings, colours, and other circumstances—endless. These differences in the elytra furnish some excellent generic distinctions, and are still more extensively useful in constituting the characters of species.

Halteres, *Poisers*, or balancers: appendages peculiar to insects of the dipterous order, and which, with sufficient reason, are deemed an essential character of that group. These poisers are two short, moveable, clavated filaments, placed one contiguous to the origin of each wing. They seldom exceed one-tenth the length of the wing, though in certain genera they are rather longer. The capital, or head, in which the filament terminates, is either roundish, oval, truncated at the end, or compressed at the sides: in some insects its situation is directly under a small, arched, filmy scale, which also varies in size and form; and in several families is apparently wanting.

The exact purpose to which nature has destined these organs has not been hitherto ascertained in a very satisfactory manner. The most prevalent, and perhaps in some measure the most consistent, opinion seems to be, that they balance or counterpoise with the action of the wings, when the insect is in flight, in the same manner as rope-dancers exercise a pole to preserve their equilibrium. The diminutiveness of their size is a plausible objection to this idea. Others consider these as the organs of that vibratory sound which dipterous insects emit in flight: they compare the filmy scale to a kind of tambour, and liken the balancer to a drum-stick, which striking repeatedly upon it, they conceive, must occasion this noise. It is apprehended the sound they emit in flight cannot be traced to this cause; for the best of all possible

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reasons, that this buzzing sound is observable in a vast number of insects which have no poisers or balancers, such as wasps and bees. The two genera *Asilus* and *Bombylius* have no scale, and yet the noise perceptible in their flight is louder than in most of those which have both scale and poisers, as in the *Muscæ*. Nor does this noise issue from the poiser, either by striking on the scale or by any other means, since it is known that if the poisers, or both poisers and scales, be cut off, the same sound continues to be heard from the mutilated insects as before.

There are many terms at present in use, to discriminate with greater precision the parts I have here described, and which should be understood by the student in entomology. I have thought it therefore best to insert them in alphabetical order at the end of the work.

THE ŒCONOMY OF INSECTS.

Most animals retain during life the form which they receive at their birth. Insects are distinguished from these by the wonderful changes they undergo. The existence of an insect partakes of two, three, or four distinct states; and in each of these differs most essentially in appearance, organization, and manners of living.

The changes through which the greater number of insects pass are from the Egg to the Larva, from the Larva to the Pupa, and from the Pupa to the Imago or perfect state. Exceptions occur to this: for some insects are viviparous; but the number of these is not considerable.

Of the EGG state. The egg, containing the insect in its smallest size, is expelled from the ovary as in other oviparous animals. They are contained and arranged in the body of the insect, in vessels which vary in number and figure in different species. The same variety is found in the eggs: some are round, others oval, and some cylindrical. The shells of some are hard and smooth, while others are soft and flexible.

The eggs of insects are of various colours: some are found of almost every shade of yellow, green, and brown, a few are red, and others black. Green and greenish are not unusual, and they are sometimes speckled with darker colours, like those of birds. Some are smooth, and others beset in a pleasing manner with raised dots.

Insects are instructed by nature to deposit their eggs in situations where their young ones will find the nourishment most convenient for them. Some deposit their eggs in the oak-leaf, producing there the red gall; others choose the leaf of the poplar, which swells into a red bladder: and to a similar cause may be assigned the knob which is often seen on the leaf of the willow. The *Lasiocampa neustria* glues its eggs

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with great symmetry in rings round the smaller twigs of trees; others affix them to the surface of leaves; and again, others lodge them in the crevices of trees.

The *Ephemera*, *Phryganea*, *Libellula*, and Gnat, hover over the water all the day to drop their eggs: these hatch in the water, and continue there while in the larva and pupa form, quitting the water only when they attain the winged state. The mass formed by the eggs of the gnat resembles a little vessel, and floats on the surface. This insect is said to deposit only one egg at a time; the first is retained by means of the legs, when dropped, till a second is deposited next to it, then a third, fourth, and further number, till the mass becomes capable, from its symmetry, to support itself upright. Many moths cover their eggs with a thick bed of hair or down, collected from their own body; others cover them with a glutinous substance, which when hard protects them from the ill effects of moisture, rain, and cold. The solitary bees and wasps prepare nests in the earth, hollow trees, or cavities in old walls, wherein they place a quantity of food for the support of the young brood when they break from the egg. The ants are known to construct nests in the earth, in which their eggs are placed with the utmost care. Some deposit their eggs in the larva of other insects, chiefly those of the moth and butterfly kind; and having passed through all their changes in their bodies, become what is termed the ichneumon-fly. The *Gasterophilus Equi* (bot-fly) deposits its eggs on the bodies of horses in the following remarkable manner. When the female has been impregnated, and the eggs sufficiently matured, she seeks among the horses a subject for her purpose; and approaching him on the wing, she carries her body nearly upright in the air, and her tail, which is lengthened for the purpose, curved inwards and upwards: in this way she approaches the part where she designs to deposit the egg; and suspending herself for a few seconds before it, suddenly darts upon it, and leaves the egg adhering to the hair: she hardly appears to settle, but merely touches the hair with the egg held out on the projected point of the abdomen. The egg is made to adhere by means of a glutinous liquor secreted with it. She then leaves the horse at a small distance and prepares a second egg, and, poising herself before the part, deposits it in the same way. The liquor dries, and the egg becomes firmly glued to the hair: this is repeated by these flies till four or five hundred eggs are sometimes placed on one horse.

The inside of the knee is the part on which these flies are most fond of depositing their eggs, and next to this on the side and back part of the shoulder, and less frequently on the extreme ends of the mane. But it is a fact worthy of attention, that the fly does not place them promiscuously about the body, but constantly on those parts which are most likely to be licked with the tongue; and the ova, therefore, are always scrupulously placed within its reach.

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Of the LARVA, or *Caterpillar* state. All caterpillars are hatched from the egg, and when they first proceed from it are generally small and feeble, but grow in strength as they increase in size. The body of the caterpillar consists of twelve rings; the head is connected with the first, and is hard and crustaceous. No caterpillar of the moth or butterfly has less than eight, or more than sixteen, feet; those which have more than sixteen belong to some other order of insects. The six anterior feet, or those next the head, are hard and scaly, pointed and fixed to the first three rings of the body, and are in number and texture the same in all Lepidopterous larvæ. The posterior feet are soft, flexible, or membranaceous; they vary both in figure and number, and are observable only in the caterpillar state, the perfect insect having only six feet, the rudiments of which are the six anterior scaly feet before mentioned. These spurious feet are either smooth or hairy, soft to the touch, or hard like shagreen. On each side of the body are nine small oval apertures, which are the spiracles or organs of respiration.

The caterpillar, whose life is one continued succession of changes, often moults its skin before it attains its full growth. These changes are the more singular, because when it moults it is not simply the skin that is changed; for we find in the exuviæ the jaws, and all the exterior parts, both scaly and membranaceous.

The change in the caterpillar is effected by the creature's withdrawing itself from the outer skin as from a sheath, when it finds itself incommoded from being confined within a narrow compass. But to accomplish this change is the work of some labour and time. Those caterpillars which live in society, and have a nest or habitation, retire there to change their skin, fixing the hooks of the feet, during the operation, firmly in the web of their nest. Some of the solitary species spin at this time a slender web, to which they affix themselves. A day or two before the critical moment approaches, the insect ceases to eat, and loses its usual activity; in proportion as the time of its change approaches, the colour of the caterpillar delines in vigour, the skin hardens and becomes withered, and is soon incapable of receiving those circulating juices by which it was heretofore nourished and supported. The insect is now seen at intervals with its back elevated, or with the body stretched to the utmost extent: sometimes raising its head, moving it from one side to another, and then letting it fall again. Near the change the second and third rings are seen considerably swollen. By these internal efforts the old parts are stretched and distended as much as possible, an operation attended with difficulty, as the new parts are all weak and tender. However, by repeated exertions, all the vessels which conveyed nourishment to the exterior skin are disengaged, and cease to act, and a slit is made on the back, generally beginning at the second or third ring. The new skin may now be just perceived, being distinguished by its freshness and brightness of colour. The caterpillar then

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presses the body like a wedge into this opening, by which means it is soon torn down from the first to the fourth ring: this renders it large enough for the caterpillar to pass through.

The caterpillar generally fasts a whole day after each moulting; for it is necessary that the parts should acquire a certain degree of consistency before its organs can perform their ordinary functions. Many perish under this operation. The caterpillar always appears much larger after it has quitted the exuviæ than before; for the body had grown under the old skin till it had become too large for it, and the parts being soft they were much compressed; but as soon as this skin is cast off, the parts distend, and with them the new skin, which is yet of a flexible and tender texture, so that their increase in size at each moulting is considerable. Some caterpillars in changing their skin alter very much in colour and appearance; sometimes the skin from being smooth becomes covered with hair, spines, or tubercles; and others that are in one stage hairy, have the skin smooth in the next. No sex is developed in the caterpillar state.

Of the PUPA state. By this term, as understood in the very extensive sense Linné proposes, is signified that state of an insect which succeeds the larva, without any regard to the particular appearance it assumes in this stage of transformation. From this latitude of meaning it includes therefore, with equal precision and no less propriety, states of the most discordant character. It alike implies the uncouth grub incased in its shelly repository and immured in the earth, sluggish, almost destitute of motion or the appearance of any animal function, with the lively half-winged locust, or the *Cicada*, animals sporting in the full enjoyment of life. The bot imprisoned in its oval covering, without the least external sign of animation, is termed a *pupa*. The moth, quiescent and absent for months, concealed in its shelly covering in the earth, or suspended aloft in its silky envelope to the branch of a tree, is a *pupa*; and we denominate those *pupæ* also which have the wings only half expanded; though, like the nimble-footed *Cimex*, they are perpetually roving, and deriving sustenance from the blood of other animals; and so also the restless *Libellula*, which is continually traversing the watery element with the facility of fishes in search of prey. Modern writers have therefore considered this state as essential in the formation of Orders, and have even laid down certain rules, which taken in conjunction with the characters of the perfect insect, are often of great use in ascertaining the order to which any genus belongs. In my account of the Larva I have given that of the lepidopterous order, and shall therefore describe the Pupa of the same.

The length of time an insect remains in this form varies much in different species. As soon as the inclosed animal acquires sufficient strength to break the bonds of its confinement, it makes a powerful effort to escape.

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The opening through which they pass is always at the same part of the skin, a little above the trunk, between the wings and a small piece which covers the head: different fissures are generally made in the same direction. When the operation begins, there seems to be a violent agitation in the humours contained in the little animal; the fluids being driven with rapidity through all the vessels, the limbs and various parts of the body are put in motion, and by repeated efforts it breaks through the brittle skin that envelopes it. Those inclosed in cones or cases, after bursting through the pupa covering, have another difficulty to overcome, that of piercing through the inclosure, which in many instances is of a stronger texture than the case of the pupa. For the accomplishment of this, most insects are provided with a liquor, which they discharge from the mouth upon that part of the cone through which they intend to escape; and this so moistens and weakens it, that after a short time they force their passage through with some facility. Some insects not provided with this fluid leave one end of their cone weaker than the rest, and close it only with a few threads, so that a slight effort of the head enables the insect to burst from its prison.

The butterfly or moth on emerging from the pupa is moist, the abdomen swollen, the antennæ bent down, and the wings crumpled, small, and shapeless. These parts are gradually unfolded, and assume their destined form. The wings, which at one instant are small and like four little buds at the sides of the thorax, in a few minutes after acquire their full size; and the fibres, which were at first flexible, become hard and rigid like bone. In proportion as the fibres lose their flexibility, the fluids which circulate within them extend, and the wings cease to act; so that, if any extraneous circumstance arrests the progress of this fluid through the fibres at the first instant of the moth's escape, the wings immediately become crippled, and never afterwards assume any other form. Most insects, soon after they have attained their perfect state, void an excrementitious substance, which in some places, where the insects were abundant, has produced reports of showers of blood.

Of the IMAGO or *Perfect State.* As the present work is not intended to enter into all the particulars relative to the *habitations, food, modes of life, &c.* I must refer the student to *Messrs. Kirby and Spence's* popular *Introduction,* in which much information on these points will be found collected together.

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OBSERVATIONS

ON THE DIFFERENT SYSTEMS OF

ENTOMOLOGY.

THE simplicity of the arrangement adopted by Linné, the celebrity of his name, and the princely patronage under which he wrote, conspired with other favourable circumstances to render this science more universally cultivated, admired, and respected about his time, than it had probably been at any former period. The credit due to this naturalist for his labours in entomology is great. This must be allowed. But let us also remember, that he is not alone entitled to our commendation for the arrangement proposed in his work. We must in candour acknowledge the merits of many among his predecessors, who wrote under circumstances of less encouragement, and have nevertheless excelled in this science; men to whom the writings of Linné stand in a very high degree indebted, and without the aid of which it is impossible to imagine the system, which now commands our admiration, could have been produced, at least in its present state of purity.

In the works of Aristotle and Pliny, in those of Agricola, Aldrovandus, Franzius, Mouffet, Swammerdam, Ray, Willughby, Lister, Vallisnieri, and various others, we distinctly perceive, with some occasional variation, the outline of the superstructure raised in the "SYSTEMA NATURÆ."

These valuable sources of information furnished him with abundant materials, which he selected with profound judgement, and interwove with ability, industry, and success. Linné was in this respect commendable: he did not suffer his mind to swerve on this occasion, from any ambitious or innovating motives; and so far as he deemed it consistent with his plan, he appears to have adhered to the examples of his predecessors. The characters of his *Ordines* are to be found in several publications earlier than his own, and so likewise are most of his *Genera*, and the far greater number of his *Species*. But these he remoulded throughout with so much skill, that this "Systema" constitutes the central point in which the scattered rays of natural science are concentrated with more precision than they really appear in the original authors to whose industry he stands indebted. It was in the concise and very expressive style which Linné

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adopts in all his works, and which was almost peculiar to himself, that he excelled.

The following are the definitions of the several Orders established by this eminent naturalist.

Order I. COLEOPTERA (derived from the Greek words for a *sheath* and a *wing*) comprise those insects which have crustaceous elytra or shells, which shut together and form a longitudinal suture down the back, as in *beetles*.

Order II. HEMIPTERA (from *half* and a *wing*). Insects having their upper wings half crustaceous and half membranaceous, not divided by a longitudinal suture, but incumbent on each other, as in *grasshoppers*, *&c.*

Order III. LEPIDOPTERA (from a *scale* and a *wing*). Insects with four wings covered with fine scales in the form of powder or meal, as in the *butterfly* and *moth*.

Order IV. NEUROPTERA (from a *nerve* and a *wing*). In this order the wings are four; membranaceous, transparent, and naked, reticulated with veins or nerves; the tail is without a sting, as in the *Libellula* or Dragon-fly.

Order V. HYMENOPTERA (from a *membrane* and a *wing*). The insects of this order have also four wings, and the tail furnished with a sting for various purposes, as in *wasps*, *bees*, *&c.*

Order VI. DIPTERA (from *two* and a *wing*). Those insects with two wings only, and poisers or balancers, as in the common *House-fly*.

Order VI. APTERA (from *without* and a *wing*). In this order Linné placed the spider, crab, scorpions, &c. As these are now universally rejected from insects, and referred to a class named *Crustacea*, I shall hereafter speak of them when mentioning the system proposed by Dr. Leach.

Fabricius distributes all insects into thirteen Classes, the characters of which are as follow:

Class I. ELEUTHERATA. *Jaws* bare, free, and bearing feelers.

Class II. ULONATA. *Jaws* covered by an obtuse mouth-piece.

Class III. SYNISTATA. *Jaws* elbowed near the base, and connected to the lower lip.

Class IV. PIEZATA. *Jaws* horny, compressed, and usually elongated.

Class V. ODONATA. *Jaws* horny, dentated; *palpi* two.

Class VI. MITOSATA. *Jaws* horny, vaulted; no *palpi*.

Class VII. UNOGATA. *Jaws* horny, unguiculated.

Class VIII. POLYGNATA. *Jaws* several (usually two), within the lip.

Class IX. KLEISTAGNATHA. *Jaws* several outside the lip.

Class X. EXOCHNATA. *Jaws* several, outside the lip, and covered by the palpi.

Class XI. GLOSSATA. *Mouth* composed of a spiral tongue, situated between two palpi.

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Class XII. Rhyngota. *Mouth* composed of a beak or articulated sheath.
Class XIII. Antliata. *Mouth* composed of a sucker, not articulated.

In the Edinburgh Encyclopædia, edited by Dr. Brewster, several valuable papers have appeared from the pen of that excellent and distinguished naturalist, Dr. W. E. Leach, the present Zoologist to the British Museum. The well-known abilities of this gentleman, his sound judgement, his great caution, and extensive correspondence with the most distinguished naturalists of Europe, will, I trust, fully justify me in adopting his system in the present work, as there is no doubt that when it is duly studied it will be universally followed: yet I must confess much still remains incomplete, and many errors no doubt will require future correction. An observation of Mr. Kirby I shall here quote, as it is valuable, and should be strongly impressed upon the mind of every naturalist, and must fully convince every liberal-minded entomologist how far the system proposed by Dr. Leach is consonant to the views of one of the first of entomologists.

"An account of any genus, perfect and elaborate in all its parts, must be the work of him who is versed in the history and œconomy of every individual that belongs to it; he, and he only can go upon sure grounds, for no other person can in all cases with certainty distinguish the species from the variety, and unite each sex to its legitimate partner. But so much knowledge, even with respect to a single genus where the species are numerous, is not to be expected from one man: nor should the naturalist attempt, like the spider, to weave his web from materials derived solely from within himself; but rather let him copy the industrious bee, and draw genuine treasures from those flowers of science which have been reared by other hands, and combining these with his own discoveries let him endeavour to concentrate all in one harmonious system, with parts curiously formed, arranged, and adapted to each other, and to the whole; and calculated to preserve the sweets of true wisdom pure and unsophisticated."

It would appear that the system of Dr. Leach, or at least the numerous genera into which it is divided, has not met with the approbation of every entomologist; since the Doctor in his *Zoological Miscellany*, vol. 3, in an account of two species of the Fabrician genus *Geotrupes*, has made the following observation: "I am a warm advocate for generic divisions (founded on the consideration of every character), being fully satisfied that such exist in nature, and, when distinguished with judgement, tend materially to the advancement of science. Those entomologists of the Linnæan school, who, by dilating the characters either of their genera or species so as to admit of almost any thing, bend nature to the artificial system of their master, would do well to consider whether they do not show greater veneration for it than for nature, and not upbraid those who hold a different opinion from themselves."

In the present work, the genera of Linné are given, not with a wish

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that the student should confine himself to that system, but merely to introduce him to a knowledge of the Families, for in this term the genera of Linné may certainly be applied in most cases, and which every entomologist will readily admit. Mr. Spence has observed, in his excellent Monograph of the Genus CHOLEVA in the XIth vol. of the *Transactions of the Linnæan Society*: "It is contrary both to analogy and experience to suppose the Creator has formed fewer of those groupes into which we divide the vast tribes of nature by the name of genera in one department than in another. Now in Botany, in which not more than about 20,000 species have been described, we have upwards of 2000 genera. In Entomology at least as many species are already described; and when we combine the circumstances, that in Britain not fewer than 8000 species of insects are to be found, while we have about 3000 plants; and these are probably not one half of the European insects, while we know that every other quarter of the globe is still more prolific in species wholly different; and lastly, that every kind of plant probably affords nutriment on the average to three or four species of insects, there can be little doubt that the insect is vastly more populous than the vegetable world. Is it likely then that the number of genera should be much fewer than in botany; or at any rate that it should not very greatly exceed its present amount? We need not fear that the science will be rendered more difficult by an augmentation of its genera. This cannot happen, if a proper system be adopted. If two or three insects, or even a single one, be strikingly characterized by peculiarity of habit, they certainly ought in any system to be distinguished at least as sections of the genera under which they are placed. And will it increase the difficulty of investigation if they be established as genera upon the same characters, and distinguished by a name? Clearly not. On the contrary, the science can be effectually promoted in no other way; for names have an important influence upon the clearness of our ideas, and it will be impossible for us ever to gain correct views of the philosophy of our science while genera essentially distinct are jumbled together under one title.

"Entomology, therefore, is under the greatest obligations to Illiger in Germany, Latreille in France," (Kirby, Leach, and Spence in England); "who having had the good sense to reject the useless while they retain the valuable parts of the Fabrician system, are labouring, by the institution of new genera built upon firm and intelligible characters, to extricate the science from the chaos into which that author has unwittingly reduced it. Fabricius's system has now had a fair trial of upwards of thirty years, and it was at one time universally followed on the continent; yet so far is experience from having confirmed the assertion of its author, that the Linnæan system is only calculated to introduce confusion into the science, that the very system professing to dissipate that confusion is even now fast sinking into oblivion, while

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the Linnæan orders and generic characters, with such improvements as reason and analogy suggest, and as Linné himself would have approved, are reverted to by the most acute and learned entomologists of the age."

ORDERS AND GENERA OF LINNÉ.

Order I. COLEOPTERA.

The insects of this Order form a very natural division. They have hard cases to their wings, with a longitudinal suture; these in some are united, and therefore such insects can have no wings; but the wings in most are two. The mouth in general is furnished with *two*, *four*, and sometimes *six palpi*, *two mandibles*, and *two maxillæ*; the *mouth* is covered above with the clypeus, and closed below with the lips: they have all six feet in their perfect state; in the antennæ there is the greatest diversity of shape and form, in this system the principal character of the genera: they have a hard horny skin; on each side they have nine spiracula, one on the thorax, and eight on the abdomen. The females lay their eggs in the earth, dung, plants, wood, &c. and from these proceed the larvæ.

The larvæ have six feet near the head, which differs in form and size in the different genera; jaws at the mouth; two eyes; often short antennæ; and on each side nine spiracula. Those that feed on plants and their roots move but slowly; those which live on dead animals are more active; others, as the *Carabidæ*, *Dyticidæ*, and *Staphylinidæ*, which feed on living animals, are very rapid in their motions. The larva state, during which insects change their skins, endures in most species for a year; in the larger species longer, sometimes three or four years. When the larva arrives at its appointed time, it draws itself together, and changes for the most part into a *pupa incompleta*, which, sometimes below the earth or in rotten wood, reposes for several weeks or months. Afterwards the skin of the pupa bursts, and the perfect insect appears. It is now fit for the propagation of its species.

Genus 1. Scarabæus.

Antennæ clavated; the *club* lamellated (*Pl.* 1. *fig.* 1. a.): *palpi* four: *mandibles* horny, in general without teeth: the *tibiæ* or second joint of the foremost pair of feet generally dentated.

Species 1. *Sc. Typhœus.* Three horns on the thorax, the middle one the smallest; the other two extending forwards and of the same length with the head, which has no horns. (*Pl.* 1. *fig.* 1.)

Inhabits Europe.

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This species burrows in cow-dung and under the earth, digging deep holes; and is found plentiful on heaths and commons during April and May. Mr. Marsham in his *Entomologia Britannica* has described 80 species of *Scarabæi* found in this country.

Genus 2. Lucanus.

Antennæ clavated; *club* perfoliate: *maxillæ* prominent and dentated: *body* oblong: *anterior tibiæ* dentated.

Sp. 1. *L. Cervus*, the Stag-beetle. With a scutellum; the maxillæ projecting, bifurcated at the apex, with many teeth on the internal edge. (*Pl.* 1. *fig.* 3.)

This is the largest of the British *Coleoptera*; the larva is white, and lives on putrid wood, particularly oak; its head and feet are of a rust colour. The perfect insect varies in size and colour; in general it is dark brown or blackish; the jaws are very large, about one third of the length of the whole insect, and have a distant resemblance to the horns of a stag; Mr. Marsham's *inermis* is only the female of this species.

Sp. 2. *L. parallelipipedus* is considerably smaller, and may be obtained in June and July in the neighbourhood of willows.

Obs. *L. caraboides* has not yet occurred in Britain, at least no British specimen is known.

Genus 3. Dermestes.

Antennæ clavated; the *club* perfoliated (*Pl.* 1. *fig.* 4. a.); the three terminating articulations larger than the rest: *thorax* convex, with scarcely any margin: *head* inflected, and partly hid under the thorax.

The larvæ of the insects of this genus feed on decayed animal substances, and are exceedingly injurious to the meat in larders, skins, furs, and books.

Sp. 1. *D. murinus.* Oblong; downy clouded with black and white; abdomen covered with fine white down or hair.

Inhabits Europe; and may frequently be found in the dead moles hung up on the hedges by countrymen. (*Pl.* 1. *fig.* 4.)

Sp. 2. *D. Scolytus.* Elytra truncate, blackish and striate: abdomen retuse: front downy and of an ash colour. (*Pl.* 1. *fig.* 5.)

The insects of this genus are very prolific; both the larvæ and perfect insect eat the roots and wood of trees, and are sometimes very destructive to woods. The following account, from Mr. Kirby's Introduction to Entomology, of *Bostrichus Typographus* Fabr., will further illustrate the habits and manners of this genus: "This insect in its preparatory state feeds upon the soft inner bark only: but it attacks this important part in such vast numbers, 80,000 being sometimes found in a single

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tree, that it is infinitely more noxious than any of those that bore into the wood: and such is its vitality, that though the bark be battered and the trees plunged into water or laid upon the ice or snow, it remains alive and unhurt. The leaves of the trees infested by these insects first become yellow; the trees themselves then die at the top, and soon entirely perish. Their ravages have long been known in Germany under the name of *Wurm trökniss* (decay caused by worms); and in the old liturgies of that country the animal itself is formally mentioned under its vulgar appellation of 'The Turk.' This pest was particularly prevalent and caused incalculable mischief about the year 1665. In the beginning of the last century it again showed itself in the Hartz forests;—it reappeared in 1757, redoubled its injuries in 1769, and arrived at its height in 1783, when the number of trees destroyed by it in the above forests alone was calculated at a million and a half, and the inhabitants were threatened with a total suspension of the working of their mines, and consequent ruin. At this period these *Bostrichi* were arrived at their perfect state, and migrated in swarms like bees in Suabia and Franconia. At length, between the years 1784 and 1789, in consequence of a succession of cold and moist seasons, the numbers of this scourge were sensibly diminished. It appeared again however in 1790, and so late as 1796 there was great reason to fear for the few fir-trees that were left."

Genus 4. Ptinus.

Antennæ filiform (*Pl.* 1. *fig.* 6. a.); the last articulations the largest: *thorax* nearly round, not margined, receiving the head under it.

Sp. 1. *Pt. imperialis.* Brown: thorax subcarinate: elytra elegantly varied with white hair. (*Pl.* 1. *fig.* 6.)

Inhabits Europe, in decayed trees.

Genus 5. Hister.

Antennæ clavated (*Pl.* 2. *fig.* 1. a.); the *club* solid; the lowest *articulation* compressed and bent: *head* retractile within the body: *elytra* shorter than the body: the *fore-tibiæ* dentated.

The insects of this genus are generally found in dung, in spring, summer, and a great part of the year. Like the *Dermestides* and *Byrrhi*, they contract their antennæ and legs when touched, and counterfeit death.

Sp. 1. *Hist. semipunctatus.* Brassy-black, polished: shells obliquely striate at the base. (*Pl.* 2. *fig.* 1.)

Inhabits dung, and is very common in this country.

Genus 6. Gyrinus.

Antennæ cylindrical, and very short (*Pl.* 2. *fig.* 2. a.): *maxilla* horny and very acute: *eyes* divide, so as to appear as four: the *four hinder feet* compressed, and formed for swimming. (*Pl.* 2. *fig.* 2. b.)

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Sp. 1. *Gyr. Natator.* Oval: elytra with punctured striæ: the inflected margin testaceous. (*Pl. 2. fig. 2.*)

Inhabits stagnant waters, running swiftly in circles on the surface, and when it dives carrying along with it a bubble of air which appears like quicksilver. These insects live in society, and often in their brisk motions strike against one another. In the evenings they betake themselves to still places under bridges, or under the roots of trees which grow at the water's edge.

Genus 7. Byrrhus.

Antennæ a little shorter than the thorax, with the four or five terminal joints gradually thicker, compressed (*Pl. 2. fig. 3. a.*): *palpi* short, the last joint longest; thick, somewhat ovate: *body* somewhat ovate, very convex above: *scutellum* minute.

When touched, they apply their antennæ and feet so close to the body, remaining at the same time motionless, that they resemble a seed more than an animated being. They are found in sand-pits and roadways in the spring months, and are very common.

Sp. 1. *Byr. Pilula.* Brown; the elytra with black interrupted striæ. (*Pl. 2. fig. 3.*)

Genus 8. Anthrenus, *Fabricius.*

Antennæ shorter than the thorax, with the *club* solid (*Pl. 2. fig. 4. a.*): *palpi* filiform, short: *body* orbiculate, ovate: *scutellum* very minute: *maxillæ* and *lip* bifid.

These insects are found on flowers; they are small, but in general prettily coloured. They contract on the appearance of danger, and appear as if dead. Their larvæ are found in carcases, skins, and dried animal substances. They pass nearly a year in that state before changing into a pupa; the perfect insects are found chiefly in spring.

Sp. 1. *Anth. Scrophulariæ.* Black; sides of the thorax and three transverse bands on the elytra, grey; suture and external margin of the elytra and hinder margin of the thorax, red-lutescent. (*Pl. 2. fig. 4.*)

Genus 9. Silpha.

Antennæ gradually thickening towards their extremities (*Pl. 2. fig. 7. a.*), or terminated by a solid or perfoliated club (*fig. 6. a.*): *elytra* covering the greater portion of the abdomen and marginated: *head* projecting: *thorax* flattish and margined: *body* oval or parallelopiped.

The *Silphæ* feed on dead carcases and the excrements of animals; they have generally a fetid smell, and when taken they discharge by the mouth or the anus a drop of black liquor of a very disgusting odour; this liquor serves to accelerate the putrefaction of the matters on which they feed. The larvæ live in the earth in dung-hills and dead carcases; they have six short feet; the head is small, armed with strong jaws; they undergo their transformations underground.

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Sp. 1. *Silpha Vespillo.* (*Pl. 2. fig. 6.*) Oblong and black: the clypeus orbicular and unequal: the elytra marked with two ferruginous fasciæ.

This species is subject to great variety in size. It is infested with *Acari*; it flies very swiftly with its elytra erect. The elytra are shorter than the abdomen. It feeds on carrion, and a small dead animal is soon visited by a number of this species, which join in burying it after they have deposited their eggs in its body. Thus a mole or a mouse is often buried by the industry of four or five of them in the space of four-and-twenty hours. They scoop out the earth all round and below the animal, which gradually sinks down; and while the agents are invisible, we see the effect by the disappearance of the carcase.

Sp. 2. *Silpha quadripunctàta.* (*Pl. 2. fig. 7.*) Black: elytra and thorax yellow, with two black spots on each elytron: head, antennæ and legs black.

Found at the roots of oak trees in the winter, and in the foliage in the months of May, June, and July.

Genus 10. Nitidula, *Fabr.*

Antennæ clavated: the *club* solid: *elytra* marginated: *head* prominent: *thorax* flattish and marginated.

In the former editions of the *Systema Naturæ* the insects of this genus were included in the genus *Silpha*, the habits of which they greatly resemble, being found in decayed animal substances, under the bark of trees, bones, &c.

Sp. 1. *Nit. discoidea.* Black: the thorax marginated: the disk of the elytra ferruginous: length $1\frac{1}{2}$ lin. (*Pl. 2. fig. 5.*).

The species of this genus are numerous, subject to great variety, and require a minute examination.

Genus 11. Opatrum, *Fabr.*

Antennæ moniliform, growing thicker at the end: *elytra* marginated: *head* prominent: *thorax* flattish and marginated.

The insects of this genus are found in sandy situations in May, June, and July.—They were arranged with the *Silphæ* by Linné.

Sp. 1. *Opat. sabulosum.* Brown: thorax emarginate: elytra dentated, with three elevated lines. (*Pl. 2. fig. 8. a. antennæ magnified.*)

Genus 12. Tritoma, *Fabr.*

Antennæ clavated: *club* perfoliated (*Pl. 2. fig. 9. a.*): *lip* emarginate: *anterior palpi* securiform: *body* much elevated: *thorax* flat.

Of this genus we have but one species at present known in this country, which inhabits fungi: I once took them in profusion at Coombe Wood in the month of March.

Sp. 1. *Trit. bipustulatum.* Black: the elytra with a scarlet spot on the shoulder, in which is a small black dot. (*Pl. 2. fig. 9.*)

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Genus 13. Cassida.

Antennæ moniliform: *thorax* and *elytra* marginated: *head* concealed under the thorax: *body* above gibbous, beneath flat and margined.

Of this genus we have several species, some of which are very brilliant in colours, which disappear when the insect dies, but are said to revive when put in warm water.

The larvæ of these insects are found under the leaves of the plants on which they feed: by means of the lateral spines and bristle at the end of the tail they form a kind of parasol with their own excrements to shelter themselves from the sun and rain, and probably to screen themselves from their enemies.

Sp. 1. *Cass. maculata.* The elytra vary in colour, the young state of the insect being green, and as it advances in age gradually approaching to red spotted with black: black on the under side. *C. murræa* of Marsham is only a variety of this. (*Pl.* 2. *fig.* 10.)

Genus 14. Coccinella.

Antennæ clavated: the *club* solid: *maxillary palpi* terminated by a large securiform joint: *body* hemispherical: *thorax* and *elytra* margined: *abdomen* flat.

The insects of this genus are commonly called in England Lady-cows, or Lady-birds. The larvæ feed chiefly on the *Aphides* or plant-lice, and are very serviceable in clearing vegetables of the myriads with which they are often infested. Mr. Marsham in his *Entomologia Britannica* has described 50 species, two-thirds of which only are genuine. So great is the variety in the species of this genus, that by a close examination scarcely two specimens will be found alike: this shows the necessity of collecting varieties, for by this means species may be decided upon; I should therefore strongly recommend the young entomologist never to disregard them, as they tend greatly to the advancement of the science, and certainly enrich a collection. Mr. Stephens (the author of the continuation to the ornithological part of Shaw's *Zoology*, and a most excellent entomologist,) for some years past has paid great attention to this genus of insects; and it his intention to lay his observations before the Linnean Society.

Sp. 1. *Cocc.* 14-*guttata.* Elytra red: with fourteen white dots: antennæ and eyes black: the spots on the elytra form four lines; the first line contains two spots, the second six, the third four, and the last two. Inhabits willows. (*Pl.* 2. *fig.* 11.)

Genus 15. Chrysomela.

Antennæ moniliform: *palpi* six, thickest at their extremity: *thorax* margined, but not the elytra: *body* for the most part ovate.

The insects of this genus are in general adorned with shining and splendid colours. They live on leaves, but do not eat the nervures.

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Their larvæ are in general of an oval shape, somewhat elongated and soft, with six feet near the head. The last joint of their feet or tarsi consists of four articulations, which in most cases serve for sexual distinctions, the tarsi of the fore feet being considerably broader in the males than in the females. This numerous and beautiful tribe is found in almost every situation: their motion is slow; and some of them when caught emit an oily liquor of a disagreeable smell.

In this genus of Linné we find many insects that differ widely from the generic character given above, which form many natural families consisting of numerous genera, the characters of which will be given in the system proposed by Dr. Leach.

Sp. 1. *Chrys. coriaria.* Apterous, oval; varies in colour from a dark blue to a black. It is a very common species, and may be found on heaths from April to June in abundance. (*Pl. 2. fig.* 12.)

Sp. 2. *Chrys. Tanaceti.* Black and punctured: the antennæ and feet black. (*Pl. 2. fig.* 13.) Galeruca Tanaceti, *Geoffroy*, *Latreille*, *Fabricius*, *Olivier*, and *Leach.*

Sp. 3. *Chrys. merdigera.* (*Pl. 2. fig.* 14.) Auchenia merdigera, *Marsham.* Inhabits the white lily.

Genus 16. Cryptocephalus, *Fabr.*

Antennæ filiform: *palpi* four: *thorax* margined, but not the elytra: *body* nearly cylindrical.

The insects of this genus in some of the sections into which it has been divided by Gmelin resemble the preceding in form and manners, and were accordingly in the former editions of the *Systema Naturæ* arranged with *Chrysomelæ*. Mr. Marsham's *Auchenia*, *Crioceris*, and *Tillus*, are separated from this genus.

Sp. 1. *Crypt. Lineola.* Body black: elytra red, with a black line on each. (*Pl. 2. fig.* 15.)

Genus 17. Hispa.

Antennæ cylindrical, approximate at the base and seated between the eyes: *palpi* fusiform: *thorax* and *elytra* often spinous or toothed.

Sp. 1. *Hispa mutica.* (*Pl. 2. fig.* 16.) Orthocerus muticus, *Latr.* Inhabits sandy situations.

Genus 18. Bruchus.

Antennæ filiform: *palpi* equal and filiform: *lip* acuminated.

Sp. 1. *Bruchus Pisi.* Elytra black, with white spots; the extremity white, with two black dots. (*Pl. 2. fig.* 17.)

Inhabits Europe, and is very destructive to fields of peas.

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Genus 19. Curculio.

Antennæ clavated, situated on the rostrum: *palpi* four, filiform.

The insects of this genus are very numerous, and subject to great diversity in form and colours. Mr. Marsham has described 234 species in his *Entomologia Britannica*, some of which are but varieties. Many species have been discovered since his work was written, and the number is probably doubled.

Sp. 1. *Curc. nitens.* Oblong, dark-violet: thorax and elytra of a blueish green. (*Pl. 2. fig.* 18.)

Inhabits Europe; is found in England on the white-thorn in woods in the month of May.

Sp. 2. *Curc. Pyri.* Bronzed with a changeable colour of yellow, red, and green: legs rufous. (*Pl. 2. fig.* 19.)

Inhabits the nut-tree, but is very local.

Sp. 3. *Curc. Nucum.* Grey-brown; rostrum as long as the body.

Inhabits the nut-tree; the larva is frequently found in the hazel nut. (*Pl. 2. fig.* 20.)

Sp. 4. *Curc. Scrophulariæ.* The coleoptra with two black spots on the back. (*Pl. 2. fig.* 21.)

Inhabits the *Scrophularia* in marshes.

Genus 20. Attelabus.

Antennæ moniliform; thickest towards the apex: *head* inclined, and acuminated behind.

Sp. 1. *Att. Coryli.* Black; elytra red and reticulated. (*Pl. 2. fig.* 22.)

Inhabits Europe: is found on the hazel; the leaves of which the larva rolls up into a cylinder, close at both ends. The form of the head in this insect is remarkable: it is shaped like a long triangle; the acute angle attached to the thorax, the eyes in the other two angles, and from the base the rostrum arises.

Genus 21. Notoxus, *Fabr.* Meloe, *Linn.* Lytta, *Marsh.*

Antennæ filiform; *palpi* four, securiform: *maxilla* with one dent or tooth.

Sp. 1. *Not. monoceros.* The thorax projecting like a horn over the head. (*Pl. 2. fig.* 23. a. head, thorax, and antennæ magnified.)

Inhabits sand-pits, is rare near London. This species has been taken in profusion on the sandy sea shores of South Wales.

Genus 22. Cerambyx.

Antennæ setaceous: *palpi* four: *thorax* spinous or gibbous: *elytra* linear.

This is a numerous genus: it has therefore been divided into several

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genera by later writers. Few of them are natives of Britain. Their larvæ live in wood, which they perforate and consume. They are the favourite food of the woodpecker. They have shorter feet than the larvæ of most other *Coleoptera*. The antennæ are often longer than the whole body, being in some species four times its length.

Sp. 1. *Cer. moschatus.*

Inhabits Europe. In England it frequently occurs on willow-trees in June.

Sp. 2. *Cer. Textor.*

Inhabits Europe. This is esteemed a very rare British insect; it occurs on willows at the Efford Mills, near Lymington in Hampshire, and near Bristol. (*Pl. 2. fig. 24.*)

Sp. 3. *Cer. arcuatus.* The elytra with four yellow fasciæ; the first interrupted, the others arched backwards. (*Pl. 2. fig. 25.*)

Inhabits Europe. Is found on the trunks of trees, but is rare in Britain.

Genus 23. Leptura.

Antennæ setaceous: *palpi* four, filiform: *elytra* attenuated towards the apex: *thorax* somewhat cylindrical.

Sp. 1. *Lept. quadrifasciata.* Black; elytra testaceous with four black fasciæ. (*Pl. 2. fig. 26.*)

Inhabits Europe. In Britain it is found in the woods of Kent on umbelliferous plants.

Sp. 2. *Lept. Nymphææ.* Hind thighs toothed: thorax and elytra coppery: body cinereous, downy.

Inhabits Europe. May frequently be found in ditches on the leaves of *Nymphæa alba* in the month of May. (*Pl. 2. fig. 27.*)

Genus 24. Necydalis.

Antennæ setaceous or filiform: *palpi* four, filiform: *elytra* smaller than the wings.

Sp. 1. *Necyd. cærulea.* Elytra subulate: abdomen blue: hind thighs of the male clavate, arcuate; those of the female simple. (*Pl. 2. fig. 28.*)

Inhabits flowers in woods and chalk-pits.

Genus 25. Lampyris.

Antennæ filiform: (*Pl. 3. fig. 1. a.*) *palpi* four: *elytra* flexible: *thorax* flat, semiorbicular, concealing and surrounding the head: the sides of the abdomen with papillary folds: the females for the most part are destitute of wings and elytra, and resemble herbivorous larvæ.

Sp. 1. *Lamp. noctiluca*, Glow-worm. Oblong and brown; the thorax ash-coloured. (*Pl. 3. fig. 1.* male, *fig. 2.* female.)

Inhabits woods, heaths, and grassy banks in the months of June and July; the female alone is luminous. The light, which is phos-

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phoric, proceeds from the last segment but one of the abdomen, and seems intended to attract the male. *Lampyris splendidula* is said to inhabit this country, but I have not yet seen any British specimen: I should therefore advise those entomologists residing at a distance from London to collect all the specimens they can obtain, and carefully examine them: the males may be taken in profusion in the evenings of the above months, if a few females be put in the entomologist's folding-net as he walks in the above places of an evening.

Genus 26. Pyrochroa, *Fabr. Gmel.*

Antennæ pectinate: *thorax* orbicular: *body* elongate, depressed. The prevailing colour in this genus is red and black.

Sp. 1. *Pyroch. coccinea.* Black: thorax and elytra of a bright scarlet red: the antennæ strongly pectinate.

Inhabits the woods of Kent in the months of June and July. (*Pl.* 3. *fig.* 3.)

Sp. 2. *Pyroch. rubens.* Black: thorax and elytra of a duller red than the preceding species.

A very common insect in the months of May and June, and may be found in most hedges where white-thorn grows.

Genus 27. Cantharis.

Antennæ filiform; *thorax* (in most species) marginated; *elytra* flexible: the sides of the abdomen with papillary folds.

This is an extremely rapacious genus, preying upon other insects, and even its own tribe.

Sp. 1. *Canth. fusca.* Thorax red, with a black spot; elytra brown. (*Pl.* 3. *fig.* 4.)

This is a numerous tribe, and forms several natural genera of modern authors.

Sp. 2. *Canth. biguttata.* Thorax black in the middle: elytra greenish-bronze; red at the apex. (*Pl.* 3. *fig.* 5.)

This insect is furnished with two red obtuse vesicles at the base of the abdomen, and two at the apex of the thorax, which are raised and depressed alternately. Common on various plants in woods in the months of May and June.

Genus 28. Elater.

Antennæ filiform: *palpi* four, securiform: *mandibles* notched, or bifid at their extremities.

Many of the coleopterous insects have a great difficulty in restoring themselves when laid on their back; the apparatus with which the insects of this genus are provided for that purpose is singular and curious. An elastic spring or spine projects from the hinder extremity of the breast, and there is a groove or cavity in the anterior part of the ab-

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domen. When laid on its back, the insect raises and sustains itself on the anterior part of the head and the extremity of the body, by which means the spine is removed from the groove where it is lodged when in its natural position; then suddenly bending its body, the spine is struck with force across a small ridge or elevation, into the cavity from whence it was withdrawn, by which shock, the parts of the body before sustained in the air are so forcibly beat against whatever the insect is laid on, as to cause it to spring or rebound to a considerable distance. The antennæ are lodged in a cavity scooped out of the under side of the head and thorax, probably to preserve them from injury when the insect falls, after its singular leap. The larvæ reside in decayed wood.

Sp. 1. *Elat. sanguineus.* Black; thorax smooth and shining: elytra of a blood red colour. (*Pl.* 3. *fig.* 6.)

Inhabits decayed oaks, and has been found in abundance under the bark of trees in June, in the New Forest of Hampshire, which is a most excellent and fertile county for insects.

Sp. 2. *Elat. cyaneus.* Blue, varying from a purple to a greenish hue: elytra striated and finely punctured. (*Pl.* 3. *fig.* 7.)

Inhabits gravel-pits in the months of May and June, under stones, clods of earth and conglomerated masses, by turning up of which the entomologist will frequently find other insects equally rare.

Genus 29. Cicindela.

Antennæ setaceous: *palpi* six, filiform; the posterior ones hairy: *mandibles* projecting with many dents: *eyes* prominent: *thorax* rounded and marginated.

This is in general a very beautiful tribe of insects; they are found in dry sandy places, and prey with the most ravenous ferocity upon all weaker insects which come in their way. The larva is soft and white, with six feet, and two tubercles on its back which assist it in retreating with its prey; the head is brown and scaly, and armed with a pair of large jaws. It lurks in a round perpendicular hole in the ground, with its head at the entrance, to draw in and devour whatever insects may come near or fall into it.

Sp. 1. *Cicind. campestris.* Green; the elytra with five white dots.

Inhabits sand-pits and other hot and dry places from April to July.

Sp. 2. *Cicind. sylvatica.* (*Pl.* 3. *fig.* 8.)

Genus 30. Buprestis.

Antennæ filiform, serrated; the length of the thorax: *palpi* four, filiform; the last articulation obtuse and truncated: *head* partly retracted within the thorax. (*Pl.* 3. *fig.* 9.)

Few of this numerous genus are natives of Britain. Many of the exotic species are remarkable for their rich metallic colours, having fre-

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quently the appearance of the most highly polished gold or copper: the larvæ live in wood.

Sp. 1. *Bupr. biguttata.* Green above, blue-green beneath; scutellum transversely impressed; apex of the elytra serrated; a white villose spot on each side of the suture, and three on the sides of the abdomen.

In England it is rather rare, but was once observed in very great abundance, by Dr. Latham, in Darent-wood, Kent.

Genus 31. Hydrophilus, *Fabr.* Dytiscus, *Linn.*

Antennæ clavated, *club* perfoliate: *palpi* four, filiform: *hinder feet* ciliated and formed for swimming, with minute claws.

The insects of this genus live in water and moist places. They may be seen in ponds during the summer and calm mild days in winter, frequently rising to the surface for fresh air; they swim well, and when laid on their backs restore themselves by whirling round; they rest in the shade, keep in the water during the day, come abroad in the evening, and are sometimes found sitting on the plants by the edge; they fly by night; after having been long out of the water they cannot dive but with difficulty: the foremost feet of the males have a hemispherical appendage. The larvæ always live in the water, and are the crocodiles of their class, killing not only aquatic insects but even fishes.

Sp. 1. *Hydroph. piceus.* Black; the sternum channelled and spiny behind.

Hydrous piceus. *Leach, from the Linnean MSS.*

This is the largest British species of the genus. The larva lives in still waters and ponds; is about an inch and a half in length; black; its head smooth and chesnut-coloured; with six short slender feet, which are actually placed on the back, and a tapering tail through which it respires.—In the month of July it is said to attain its utmost size, and leaving the water, creeps upon the dry ground to a heap of dung, (cow-dung if it be near,) and makes a hole under it pretty deep, and so wide that it can lie in it rolled up in a circle, and there it changes into its pupa state. About the middle of August the perfect insect appears. Like most of the aquatic insects it lives through the winter, diving deep into the mud in the most inclement weather.

Sp. 2. *Hydroph. caraboides.* (*Pl. 3. fig.* 16.)

Genus 32. Dytiscus.

Antennæ setaceous; *palpi* six, filiform: *hind feet* villous, formed for swimming, with the claws very minute. (*Pl. 3. fig.* 13, 14 *&* 15.)

The insects of this genus are very numerous, and are well deserving the attention of the entomologist. In Dr. Leach's system they are divided into several very natural genera: they are found in almost every

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pond, ditch, and rivulet, but many of the species are very local: they may be obtained in the above-mentioned situations at all seasons of the year.

Genus 33. Carabus.

Antennæ filiform; *palpi* six, the last articulation obtuse and truncated: *thorax* obcordate, truncated at the apex, and marginated: *elytra* margined.

Mr. Marsham has described 109 British species of this genus: the generality of them are found on the ground, under stones, in sand-pits &c. a few are found in trees, feeding on the larvæ of *Lepidoptera*. The whole of this tribe are very voracious, preying on all insects which they can overcome; they discharge, when taken, a brown caustic and fetid liquor: many of them want wings; though their elytra in general are separate and moveable: their larvæ live in putrid wood, among mosses, in the earth, &c.

Pl. 3. *fig.* 17, 18, 19, & 20, belong to this genus of Linné. They are types of so many genera, the characters of which are given in the system of Dr. Leach.

Genus 34. Tenebrio.

Antennæ moniliform; the last articulation nearly round: *thorax* with a small degree of convexity, and marginated: *head* standing out: *elytra* somewhat rigid.

Sp. 1. *Tenеb. Molitor.* Brownish-black; the anterior thighs the thickest. (*Pl.* 4. *fig.* 1.)

The larvæ of this insect are called *Meal-worms*, and are found in meal, bakers' ovens, dry bread, &c. They are of a pale colour, smooth, with thirteen segments, soft; and are the favourite food of nightingales, and other *Motacillæ*.

Genus 35. Blaps, *Fabr.*, *Marsh.* Tenebrio, *Linn.*

Antennæ filiform; *palpi* four: *thorax* with a small degree of convexity, and marginated: *head* standing out: *elytra* somewhat rigid: *wings* (in most species) wanting.

Sp. 1. *Bl. mortisaga.* Black; coleoptra ending in a point, and smooth; the antennæ moniliform at the apex.

This species wants the wings: it walks slowly, and is therefore called the slow-legged beetle: when taken it emits a certain colourless but very fetid liquor.

Genus 36. Lytta, *Fabr.* Meloe, *Linn.*

Antennæ filiform: *palpi* four, unequal, the hind ones clavated: *thorax* somewhat round: *head* inflected and gibbous: *elytra* soft and flexible.

Sp. 1. *Lytta vesicatoria.* Green; the antennæ black. (*Pl.* 4. *fig.* 5.)

Inhabits the south of Europe, and is occasionally found in Britain.

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This is the common Spanish fly: it is found on the privet, the ash, the elder, the poplar, &c. It is so light when dried that fifty of them scarcely weigh a dram.

Genus 37. Meloe.

Antennæ moniliform: *thorax* nearly round: *elytra* soft, flexible, and shorter than the abdomen: *head* inflected, gibbous. (*Pl.* 4. *fig.* 7.)

Sp. 1. *Mel. Proscarabæus.* Of a violet colour.

Found in spring, particularly in open sandy fields, feeding on the different species of *Ranunculus*, &c.; its ova have an agreeable smell; when touched, there issues from it a very limpid yellowish oil, which is exceedingly diuretic, and when mixed with honey or oil has been recommended in cases of hydrophobia.

Genus 38. Mordella.

Antennæ moniliform or pectinated: *palpi* four, the anterior ones clavated, the hinder filiform: when frightened, it hides its head beneath the thorax: *elytra* narrower towards the apex, and slightly curved: before the thighs a broad plate at the base of the abdomen. The insects of this genus inhabit flowers.

Sp. 1. *Mord. fasciata.* (*Pl.* 4. *fig.* 8.)

Genus 39. Staphylinus.

I shall omit the generic character of Linné, and refer the student to those genera given in Dr. Leach's system. Mr. Marsham has described only 87 species of this very extensive family: 500 species at least are found to be natives of this country, many of which are exceedingly minute, but very interesting. (*Pl.* 4. *fig.* 10, 11, 12, 13 & 14.)

Genus 40. Forficula.

Antennæ setaceous: *palpi* unequal and filiform: *elytra* truncated and shorter than the abdomen, the extremity of which is armed with forceps.

Sp. 1. *Forf. auricularia*, Earwig.

Order II. HEMIPTERA.

Many of the insects of this Order are furnished with a rostrum which is inflected and bent inwards towards the breast. Their wing-cases are *hemelytratæ*, or of a substance less hard than those of the preceding order; they do not meet together and form a longitudinal suture, but have some part of their anterior margins crossed or laid one over the other.

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Genus 41. Blatta.

Head inflected: *antennæ* setaceous: *palpi* unequal, filiform: *elytra* and *wings* flat, and nearly coriaceous: *thorax* nearly flat, orbicular, and marginated: *feet* formed for running: *two horns* above the tail in most species. (*Pl.* 4. *fig.* 17.)

Sp. 1. *Bl. orientalis*, Black-beetle or Cock-roach.

This insect was originally a native of South America, but is now very generally spread throughout Europe. It cannot be considered a British insect, though it frequents kitchens, ovens, and warm places, and devours meal, bread, and other provisions, shoes, &c. It conceals itself during the day, and comes abroad in the night; it runs quickly, and is very tenacious of life. They are killed by red wafers.

Genus 42. Gryllus.

Head inflected, furnished with maxillæ and filiform palpi: *antennæ* setaceous or filiform: *wings* four, deflected and convoluted; the under ones folded: *hind legs* formed for leaping: *two claws* on all the feet.

Sp. 1. *Gr. flavipes.* (*Pl.* 4. *fig.* 19.)

Inhabits marshes, but is very local in Britain.

Genus 43. Cicada.

Rostrum inflected: *antennæ* setaceous: *wings* four, membranaceous and deflected: *feet* formed for leaping. (*Pl.* 5. *fig.* 1 & 2.)

Sp. 1. *Cic. viridis.* Elytra green: head yellow, with black dots.

Inhabits aquatic plants in ditches.

Genus 44. Notonecta.

Rostrum inflected: *antennæ* shorter than the thorax: *wings* four, folded together crosswise; coriaceous at the base: *hinder feet* ciliated, formed for swimming.

The insects of this and the following genus live in water, feeding on aquatic animalcula; the larva and pupa have each six feet; they are active, and swim like the perfect insect; the former wants wings, the latter has the rudiments of them. (*Pl.* 5. *fig.* 3.)

Sp. 1. *Not. minutissima.* Grey; the head brown: the elytra truncated.

Inhabits ponds.

Genus 45. Nepa.

Rostrum inflected: *antennæ* short: *wings* four, folded crosswise, the anterior part of them coriaceous: the *two fore feet* cheliform; the others formed for walking.

Sp. 1. *Nepa cinerea.* Of an ash colour: the thorax unequal: the body oblong, ovate. (*Pl.* 5. *fig.* 4.)

Inhabits ponds and ditches; is very common in Britain throughout the year.

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Genus 46. Cimex.

Rostrum inflected: *antennæ* longer than the thorax: *wings* four, folded crosswise; the upper ones coriaceous in the anterior part: *back* flat: *thorax* marginated: *feet* formed for running. (*Pl.* 5. *fig.* 6, 7, 8.)

The insects of this genus, whether as larvæ or in the perfect state, feed for the most part on the juices of plants; some on the larvæ of other animals: they have in general a very disagreeable smell. The larvæ and pupæ have six feet; they are active, and walk about like the perfect insect: the former has no wings, the latter has the rudiments of them. A great number of species are found in Britain.

Sp. 1. *Cimex lectularius.* Without wings.
Inhabits Europe.

This insect (the bed-bug) is unhappily but too well known, and was an inhabitant of Europe prior to the Christian æra; at least it is mentioned by Aristophanes and other Greek writers. Southall says it was hardly known in London before 1670; but there is good authority for asserting that it was common enough there before the great fire in 1666. It is a nocturnal animal, very fetid; seldom, though sometimes, found with wings; easily killed when taken alive. Bugs are said to be expelled in a variety of ways, viz. by charcoal and oil of turpentine, soft soap, or hard pomatum.

Genus 47. Aphis.

Rostrum inflected: the *vagina* with five articulations and a single seta: *antennæ* setaceous, longer than the thorax: *wings* four, erect, or none: *feet* formed for walking: the *abdomen* generally armed with two horns. (*Pl.* 5. *fig.* 9.)

The insects of this genus are small and defenceless; but very noxious animals, and most remarkable for the singularities in their history and manners. They seldom appear before autumn, when the males impregnate their females, which soon thereafter lay eggs or rather a sort of capsule in which the young *Aphides* lie already perfectly formed, but do not break their shell till the following spring. When they appear, it is very remarkable that they are almost wholly females, with hardly a male to be seen during the whole spring and summer. Notwithstanding this, all these female *Aphides* without any communication with a male are able to propagate their species, and seem to have received the genial influence not merely for themselves alone but for their posterity to the ninth generation. During the whole summer they are viviparous; and if a young *Aphis* be taken immediately upon exclusion from the mother, and kept apart, it will produce young; which young, if also kept apart, will likewise produce, and so on, without the presence of a male. Towards autumn, however, this singular fructification begins to lose its wonderful effects; the *Aphides* cease to bring

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forth females only; males likewise are produced, which immediately celebrate their nuptial rite, that is to communicate fertility to the whole female posterity of the following summer.

Genus 48. Chermes.

The *rostrum* rising from the breast with a vagina and three inflected setæ: *antennæ* cylindrical, longer than the thorax: *wings* four, deflexed; *thorax* gibbous: *feet* formed for leaping. (*Pl.* 5. *fig.* 10.)

The larvæ of the insects of this genus are furnished with feet and generally covered with down. In the perfect state they greatly resemble the *Aphides*.

Genus 49. Coccus.

Antennæ filiform: *abdomen* furnished with two setæ: *rostrum* rising from the breast with a vagina and setæ: *two erect wings* in the males; none in the females. (*Pl.* 5. *fig.* 11.)

Sp. 1. *Coccus Cacti.*

This insect, so useful when properly prepared to painters and dyers, is a native of South America, where it is found on several species of *Cactus*, particularly the *Cactus Opuntia* or Prickly-pear. The insects are collected in a wooden bowl, thickly spread from thence upon a flat dish of earthenware, and placed alive over a charcoal fire, where they are slowly roasted until the downy covering disappears and the aqueous juices of the animal are totally evaporated. During this operation the insects are continually stirred about with a tin ladle, and sometimes water is sprinkled upon them to prevent absolute torrefaction, which would destroy the colour and reduce the insect to a coal; but a little habit teaches when to remove them from the fire. They then appear like so many dark, round, reddish grains, and take the name of Cochineal, preserving so little the original form of the insect that this precious dye was long known and sought in Europe before naturalists had determined whether it was animal, vegetable, or a mineral substance.

Genus 50. Thrips.

Rostrum indistinct: *antennæ* filiform, of the length of the thorax: *body* linear: *abdomen* curved upwards: *wings* four, straight, lying upon the back; longitudinal, narrow, and somewhat crossed. (*Pl.* 5. *fig.* 12.)

The insects of this genus are small, and are found on the flowers of various plants.

Order III. LEPIDOPTERA. (Glossata, *Fabr.*)

The insects of this order contain the butterflies, moths, and hawk-moths; have all four wings covered with scales or a sort of farina: they have a mouth (the jaws of which have lately been discovered, de-

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scribed and figured by Savigny in his *Mémoires sur les Animaux sans Vertèbres*, Paris, 1816.), with palpi, a spiral tongue; the body covered with hair. The scales resemble feathers: they lie over one another in an imbricated manner, the shaft towards the body of the insect and the expansion towards the end of the wing, reflecting the most brilliant colours.

Genus 51. Papilio.

Antennæ clavate, gradually thickening towards their extremity: *wings* when at rest erect and meeting upwards. All the insects of this genus fly in the day-time.

Linné in a peculiar and instructive manner divided this beautiful and numerous tribe into sections, instituted from the habit or general appearance, and in some degree from the distribution of the colour of the wings.

Sp. 1. *Pap. Machaon.*

This is an insect of great beauty, and may be considered as the only British species of *Papilio*. It is well known to collectors by the title of the Swallow-tailed butterfly, and is of a beautiful yellow, with black spots or patches along the upper edge of the superior wings; all the wings are bordered with a deep edging of black, decorated by a double row of crescent-shaped spots, of which the upper row is blue and the lower yellow. The under wings are tailed, and are marked at the inner angle or tip with a round red spot bordered with blue and black. The larva of this species feeds on fennel and other umbelliferous plants. It is of a green colour encircled with numerous black bands spotted with red, and is furnished on the top of the head with a pair of short tentacula of a red colour. In the month of July it changes into the chrysalis or pupa state, fixed to some part of the plant on which it feeds, and in the month of August the perfect insect appears. It frequently happens that two broods of this butterfly are produced in the same summer; one in May, having been in the pupa state all the winter, the other in August from the pupa of July. (*Pl.* 6. *fig.* 1.)

Genus 52. Sphinx.

Antennæ attenuated at each end: *tongue* in most species stretched out: *palpi* two: *wings* deflected.

Some of the species of this genus are the largest of lepidopterous insects. They fly very swift, for the most part early in the morning and late in the evening, some of the smaller species during the day.

Sp. 1. *Sphinx Elpenor*, Elephant Hawk. (*Pl.* 6. *fig.* 2.)

Genus 53. Phalæna.

Antennæ setaceous, and gradually tapering from the base to the tip: *tongue* spiral: the *wings* when at rest are generally deflected.

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Moths fly abroad only in the evening and during the night, and obtain their food from the nectar of flowers. The larva is active and quick in motion, and preys voraciously on the leaves of plants.

Sp. 1. *P. Quercus.* Bombyx Quercus, *Fabr.* (*Pl.* 6. *fig.* 3.)

Order IV. NEUROPTERA.

The insects of this Order have four membranaceous wings, generally transparent with strong nervures. At the tail they have often an appendage like pincers, but no sting.

Genus 54. Libellula, *Dragon-fly.*

Mouth armed with jaws, more than two: *lip* trifid: *antennæ* shorter than the thorax; very slender and filiform: *wings* extended: the *tail* of the male is furnished with a hooked forceps.

The insects of this genus are well known; they are remarkable for a long slender body and wings standing out at right angles. The larvæ have six feet, and move with great activity in the water: at the mouth they are furnished with an articulated forceps: they are very voracious, and are the crocodiles of aquatic insects. The larvæ and pupæ are not very different; the latter have the rudiments of wings: in a fine day in June, a person standing by a pond may observe them approach the bank for the purpose of changing their element. Having crawled up a blade of grass or bit of dry wood, the skin of the pupa grows parched and splits at the upper part of the thorax. The insect issues forth gradually, throws off its slough, in a few minutes expands its wings, flutters, and then flies off. The sexual parts in the male are placed under the thorax; in the female at the extremity of the body.

Sp. 1. *L. quadrimaculata.* (*Pl.* 7. *fig.* 1.)
Inhabits the banks of ponds, but is not common.

Genus 55. Ephemera.

Mouth without mandibles: *palpi* four, very short, and filiform: *maxilla* short, membranaceous, cylindrical, connected with the lip: *antennæ* short, and subulated: *two large stemmata* above the eyes: *wings* erect, the hind ones very small: *setæ* at the tail.

Sp. 1. *E. vulgata.* (*Pl.* 7. *fig.* 2.)

This is the largest of the British species. In the evenings in the month of June it assembles in vast numbers under trees near waters, and seems to divert itself for hours together, ascending and descending in the air as if dancing. In the neighbourhood of Luz, in Carniola, these insects are produced in such quantities, that when they die they are gathered to manure the land by the country-people, who think they have been unsuccessful if each does not procure twenty cart-loads of them for that purpose. Their larvæ are the favourite food of fresh-

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water fishes, as are also the flies: they are more numerous in running than in standing waters.

Genus 56. Phryganea.

Mouth with a horny, short, arched, acute mandible, without teeth; and a membranaceous maxilla: *palpi* four: *stemmata* three: *antennæ* setaceous, longer than the thorax: *wings* incumbent; the hinder ones folded. (*Pl. 7. fig. 3.*)

Genus 57. Hemerobius.

Mouth with a straight horny mandible: a cylindrical, straight, cleft *maxilla*: *lip* stretched forward and entire: four projecting, unequal, filiform *palpi:* no *stemmata: wings* deflected, not folded: *antennæ* setaceous, projecting, and longer than the thorax, which is convex.

The species of this genus in all their stages feed upon small insects, especially the *Aphides;* their larvæ have six feet; in most species they are oval and hairy; the pupæ are inactive, and inclosed in a case. The eggs are deposited on leaves in the midst of *Aphides;* they are supported on small pedicles and set in the form of bunches. The larvæ attain their growth in fifteen or sixteen days, and the *pupa incompleta* remains for three weeks before the fly comes forth.

Sp. 1. *H. Chrysops.* (*Pl. 7. fig. 4.*) Chrysops maculata, *Leach.*

Genus 58. Panorpa.

Mouth stretched out into a cylindrical horny rostrum: the *mandible* is without teeth: *maxillæ* bifid at the apex: *lip* elongated, and covering the whole mouth: *palpi* four, nearly equal: *stemmata* three: *antennæ* filiform: the *tail* of the male armed with a chela, that of the female unarmed.

Sp. 1. *P. communis.* (*Pl. 7. fig. 5. a. chela magnified.*)

Genus 59. Raphidia.

Mouth with an arched, dentated, horny *mandible:* a cylindrical, obtuse horny *maxilla:* a rounded, entire, and horny *lip: palpi* four, very short, nearly equal, and filiform: *stemmata* three: *wings* deflected: *antennæ* filiform, of the length of the thorax; elongated before, and cylindrical: *tail* of the female with a lax recurved seta. (*Pl. 7. fig. 6.*)

Order V. HYMENOPTERA.

Wings four, membranaceous: *mouth* with maxillæ, and some of them likewise a tongue. Between the large eyes they have generally three stemmata. At the extremity of the abdomen the females of several of the genera have an aculeus or sting, that lies concealed within the abdomen, which is used as a weapon, and instils into the wound an acid poison: those which want the sting, are furnished with an oviduct, that

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is often exserted, and with which the eggs are deposited either in the bodies of the caterpillars of other insects, or in wood. From these eggs the larvæ are produced, which in some have no feet; in others more than sixteen. They change to *pupæ incompletæ*, which are inclosed in cases. Some of the insects of this Order live in societies, others are solitary.

Genus 60. Cynips.

Mouth with a short membranaceous maxilla with one dent: an arched horny *mandible* cleft at the apex: a short, cylindrical, entire, horny *lip*: four short unequal *palpi*: *antennæ* moniliform, aculeus spiral, and in general hidden within the body.

The *Cynipes* pierce the leaves, &c. of plants with their sting, and deposit their eggs in the wound; the extravasated juices rise round it and form a gall, which becomes hard, and in this the larva lives and feeds, and changes to a pupa.

Sp. 1. *C. Quercus folii.* (*Pl.* 8. *fig.* 1.)

The larva is found in galls, adhering to the under side of oak leaves, of the size of hazel-nuts.

Genus 61. Tenthredo.

Mouth with a horny arched mandible, dentated within: *maxillæ* obtuse at the apex: *lip* cylindrical and trifid: *palpi* four, unequal, and filiform.

The larvæ of the insects of this genus have from sixteen to twenty-eight feet; a round head: when touched they roll themselves together. They feed on the leaves of plants. When full-grown, they make, sometimes in the earth and sometimes between the leaves of the plant on which they feed, a net-work case, and within it change to a *pupa incompleta*, which for the most part remains during the winter in the earth. The species are very numerous, and consist of many natural genera.

Sp. 1. *T. Scrophulariæ.* (*Pl.* 8. *fig.* 2.)

Inhabits the Water Betony.

Genus 62. Sirex.

Mouth with a thick, horny mandible, truncated at the apex, and denticulated: an incurved, acuminated, cylindrical, ciliated *maxilla*, and a *lip*, both of them membranaceous and entire; the whole short: *palpi* four, the hind ones the longest, increasing towards their apex: *antennæ* filiform, with more than twenty-four equal articulations: *oviduct* exserted, stiff, and serrated: *abdomen* sessile, terminating in a point or spine: *wings* lanceolated, and not folded.

Sp. 1. *S. Gigas.* (*Pl.* 8. *fig* 3.)

Genus 63. Ichneumon.

Mouth with a straight membranaceous, bifid maxilla, rounded at the apex, dilated, ciliated, and horny: an arched, acute, horny *mandible*,

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without teeth: *lip* cylindrical, emarginated, horny, and membranaceous at the apex: *palpi* four, unequal, filiform: *antennæ* setaceous.

The insects of this genus lay their eggs in the bodies of caterpillars or pupæ, which are there hatched: the larvæ have no feet; they are soft and cylindrical, and feed on the substance of the caterpillar; this last continues to feed, and even to undergo its change into a chrysalis, but never turns to a perfect insect: when the larvæ of the ichneumon are full grown they issue forth, spin themselves a silky web, and change into a *pupa incompleta*, and in a few days the fly appears. The genus is very numerous, upwards of 800 species are found in this country.

Sp. 1. *I. Manifestator.* (*Pl.* 8. *fig.* 4.)

Genus 64. Sphex.

Mouth with an entire maxilla: a horny, incurved, dentated mandible: a horny *lip*, membranaceous at the apex: *palpi* four: *antennæ* filiform: the *aculeus* or *sting* concealed within the abdomen.

The insects of this genus form their cells in sand-banks, and they are occasionally found on umbelliferous plants; the larva is soft, without feet, and lives in the bodies of dead insects in which the mother had previously deposited her eggs.

Sp. 1. *S. sabulosa.* (*Pl.* 8. *fig.* 5.)

Inhabits sand-banks: is common in Norfolk, Suffolk, and the Hampshire coast, in June and July.

Genus 65. Chrysis.

Mouth horny and porrected: the *maxillæ* linear, much longer than the *lip* which is emarginated: *palpi* four, unequal and filiform: *antennæ* filiform, the first articulation the longest, the remainder short: *body* shining and finely punctured, the abdomen arched underneath; the extremity, in most species, dentated: the *sting* somewhat exserted: *wings* not folded.

The species of this genus inhabit sand-banks, old walls, or decayed wood. They rarely appear but in the middle of the day, and then only when the sun shines.

Sp. 1. *C. bidentata.* (*Pl.* 8. *fig.* 7.)

Genus 66. Vespa, *Wasp.*

Mouth horny; *maxillæ* compressed; *palpi* four, unequal and filiform; *antennæ* filiform, the first articulation the longest, and cylindrical; *eyes* shaped like a crescent; *body* smooth; the *sting* hid within the abdomen; the upper *wings* folded in both sexes.

The insects of this genus live in society; they prey on insects that have naked wings, particularly bees and flies; the larva is soft and without feet; the pupa is motionless. Wasps make a hive of a substance like paper formed of wood reduced to a paste; the combs are horizontal,

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and have only one row of hexagonal cells, flat at bottom, the mouth turned downwards, which serve only for holding the young. Every hive is begun by a mother, who at first deposits a few eggs, from which neuters are produced, or working wasps, who assist her in increasing her work and in feeding the young afterwards produced. Neither males nor females are produced till towards the month of September. Before that time there are none in the nest but the female and the neuters she has engendered. The females remain in the nest. The males do no work. Wasps feed their larvæ with insects, meat, and the fragments of fruits. Towards autumn they are said to kill such of the larvæ and pupæ as cannot come to perfection before the month of November. The males and neuters perish themselves during winter, and none remain but a few impregnated females to perpetuate the species.

Sp. 1. *V. Crabro*, the Hornet Wasp. (*Pl.* 8. *fig.* 8.)

Inhabits Europe, generally forming its nest in the trunks of trees.

Some little caution is necessary in taking the insects of this species, as without care the entomologist is subject to be stung by them. I have found that the bag net (*Pl.* 11. *fig.* 4.) is the best means of taking them. The insects when secured in the net should be gently trodden upon, not sufficiently to injure, but merely to numb them; a pin should then be passed through the thorax, and the insect placed in the pocket box.

Genus 67. Apis, *Bee.*

Mouth horny: *maxillæ* and *labium* membranaceous at the apex: *tongue* inflected: *palpi* four, unequal and filiform: *antennæ* filiform: *wings* not folded: *aculeus* in the females and neuters concealed in the abdomen.

Sp. 1. *A. retusa*, Linn. (female) *pennipes*, (male) (*Pl.* 8. *fig.* 9. male.)

Mr. Kirby has described upwards of 200 indigenous species of this genus in his admirable work entitled *Monographia Apum Angliæ*, 2 vols. 8vo. This work is indispensable in the library of every entomologist.

Genus 68. Formica, *Ant.*

Palpi four, unequal, with cylindrical articulations, seated on a submembranaceous cylindrical lip: *antennæ* filiform; between the thorax and the abdomen a small erect scale: the *sting* concealed in the abdomen, and possessed only by the females and neuters. The males and females only have wings.

All the species of this genus are of three sorts, males, females, and neuters. The neuters alone labour; they form the ant-hill, bring in the provisions, feed the young, bring them to the air during the day, carry them back at night, defend them against attacks, &c. The females are said to be retained merely for laying eggs, and as soon as that is accomplished they are unmercifully discarded. The males and females perish with the first cold; the neuters lie torpid in their nest.

Sp. 1. *F. herculanea.* (*Pl.* 8. *fig.* 10.)

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Genus 69. Mutilla.

Mouth horny, without a tongue: *maxilla* membranaceous at the apex, the lip projecting, obconical, bearing on its apex four unequal *palpi* with obconical articulations: *antennæ* filiform. In general the males are winged, and the females are apterous: *body* pubescent: *sting* concealed.

Sp. 1. *Mutilla europæa.* (*Pl.* 3. *fig.* 11. male.)

Order VI. DIPTERA.

This Order includes all those insects that have but two wings, and behind, or below them, two globular bodies, supported on slender pedicles called *Halteres* or poisers. At the mouth they have a proboscis, sometimes contained in a vagina, and sometimes furnished at its sides with two palpi but no maxilla. Their eyes are reticulated and large. The females, in general, lay eggs, but some are viviparous; the larvæ of the insects of this order are as various in their appearance as the places in which they are bred. In general they do not cast their skins, but change into a pupa state.

Genus 70. Oestrus, *Gad-fly.*

Haustellum retracted within the lips, which are tumid and grown together with a small pore and no palpi; the *vagina* is membranaceous, cylindrical, obtuse, including three membranaceous *setæ*, which are flexible, short, and reflected; *antennæ* short and setaceous.

The insects of this genus lay their eggs in the nostrils or in the skins of horses, oxen, rein-deer, goats, and sheep; their larva is bred, and feeds on the fat of these animals, or on the matter which is generated in the wound. It is soft and without feet: in some species it has at the extremity two hooks, which it uses to assist it in walking. These hooks are wanting in the larvæ which reside in the skins of oxen and rein-deer. When full grown the larvæ let themselves fall on the ground, they enter the earth and change into an oval hard pupa. The perfect insect takes no food. [Mr. Bracy Clark has written an excellent paper on the insects of this genus, published in the third volume of the *Transactions of the Linnean Society;* which has been re-published with additional remarks, and entitled an Essay on the Bots of Horses, &c. 4to, 1815.]

Sp. 1. *O. Bovis.* (*Pl.* 9. *fig.* 1.)

Genus 71. Tipula.

Mouth furnished with a very short proboscis, membranaceous, grooved on the back, and receiving a bristle; a short *haustellum* without a *vagina;* two incurved *palpi*, equal, filiform, and longer than the head; *antennæ* in most species filiform.

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The insects of this genus live on garbage; the larvæ have no feet, they are cylindrical and soft; they feed on the roots of plants under which they live; the pupæ are motionless and cylindrical, with two horns before, dentated behind. Some species live in the water, and either swim or roll themselves up in a case.

Sp. 1. *T. oleracea.* (*Pl.* 9. *fig.* 2.)

Genus 72. Musca.

Mouth with a fleshy exserted proboscis; two equal *lips* and a *haustellum* furnished with setæ, and two short *palpi*; *antennæ* in most species short.

Sp. 1. *M. inanis.* (*Pl.* 9. *fig.* 3.)

Genus 73. Tabanus.

Mouth with a straight exserted membranaceous proboscis, ending in an ovate capitulum or knob; with two equal *lips*; *haustellum* projecting, exserted, and received into a groove in the back of the proboscis; *vagina* univalve, with five *setæ* and two equal *palpi*, the last articulation of which is thicker than the rest; *antennæ* short, approximate, cylindrical, with seven articulations; the third generally largest, and armed with a lateral dent.

The insects of this genus suck the blood of animals. They are of a dull plain appearance, but their large eyes are in general beautifully coloured—these colours fade after they are dead.

Sp. 1. *T. tropicus.* (*Pl.* 9. *fig.* 4.)

Genus 74. Culex, *the Gnat.*

With an exserted, univalve, flexible *vagina*; five *setæ*; *palpi* two, consisting of three articulations; *antennæ* filiform.

Sp. 1. *C. pipiens.* (*Pl.* 9. *fig.* 5.)

Inhabits Europe and the northern parts of Asia and America.

This insect is frequent in the neighbourhood of waters and marshy places. In southern regions there is a larger species which is known by the name of *Musquetoe.* Its bite is painful, raising a considerable degree of inflammation, and its continual piping note is exceedingly irksome where it abounds, especially during the night. When it settles to inflict the wound and draw the blood, it raises its hind pair of feet. In Lapland, the injuries the inhabitants sustain from it are amply repaid by the vast numbers of water-fowl and wild-fowl which it attracts, as it forms the favourite food of their young.

Genus 75. Empis.

Haustellum inflected; *vagina* univalve, with three setæ and a proboscis; *palpi* short and filiform; *antennæ* setaceous.

The changes of these insects are unknown; they are common on

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flowers and in gardens; their head is small and round, the thorax gibbous, the feet long, the proboscis small and inflected.

Sp. 1. *E. pennipes.* (*Pl.* 9. *fig.* 6.)

Genus 76. Conops.

Mouth with a porrected, geniculated rostrum; *antennæ* clavated; the *clava* acuminated.

Sp. 1. *C. macrocephala.* (*Pl.* 9. *fig.* 8.)

Genus 77. Asilus.

Mouth with a straight, horny, bivalve *haustellum*, which is gibbous at the base; *antennæ* filiform.

The insects of this genus live by preying on those of the Dipterous and Lepidopterous orders. When they are at rest, their wings in general are incumbent on the abdomen, which is long and small, often hairy, particularly the feet, and these end in small claws. Their larvæ feed in the earth, on the roots of plants: they change into a *pupa coarctata*, beset with setæ.

Sp. 1. *A. crabroniformis.* (*Pl.* 9. *fig.* 9.)

Genus 78. Bombylius.

Mouth with a very long setaceous, straight, bivalve haustellum; the valves unequal, with three setæ; *two short hairy palpi; antennæ* subulated, united at the base.

The insects of this genus, while they fly, suck the nectareous juices of flowers.

Sp. 1. *B. major.* (*Pl.* 9. *fig.* 10.)

Genus 79. Hippobosca.

Mouth with a short, cylindrical, bivalve haustellum; the valves equal; *antennæ* filiform; *feet* with several claws.

The insects of this genus live by sucking the blood of animals; and stick so fast to their skins, that they must be torn before they can be taken off.

Sp. 1. *H. equina.* (*Pl.* 9. *fig.* 11.)

Order VII. APTERA.

In this Order Linné arranged (if we except the Flea, Louse, and Lepisma,) animals widely different from genuine insects: I shall only enumerate the names of Linné, and the Classes they constitute. The characters of the numerous tribes and genera into which they are distributed, are fully detailed in the article "*Annulosa*" in the Supplement to *Encyc. Brit.* vol. 1. part 2.

The following genera belong to the Class *Insecta*, the characters of

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which will be found in Dr. Leach's System, viz. LEPISMA, PODURA, PEDICULUS, PULEX, and TERMES. Genera ACARUS, PHALANGIUM, ARANEA, and SCORPIO, belong to the Class *Arachnöidea*. Genera CANCER, MONOCULUS, and ONISCUS, to the Class *Crustacea*: SCOLOPENDRA and JULUS, to the *Myriapoda*. The characters of the above enumerated Classes will be given hereafter.

☞ It should be observed that those of the above genera, to which are affixed the names of other authors, are not to be found in the writings of Linné, but have been adopted in the various translations and editions since the twelfth of the *Systema Naturæ*; and are generally received by those who adhere to that system. The following synoptical view from the 12th edition of the *Systema Naturæ*, will show the extent of Entomology as left by Linné himself.

Order I. COLEOPTERA.

* *Antennæ clavated or gradually increasing.*

SCARABÆUS, LUCANUS, DERMESTES, HISTER, BYRRHUS, GYRINUS, ATTELABUS, CURCULIO, SILPHA, COCCINELLA.

** *Antennæ filiform.*

BRUCHUS, CASSIDA, PTINUS, CHRYSOMELA, HISPA, MELOE, TENEBRIO, LAMPYRIS, MORDELLA, STAPHYLINUS.

*** *Antennæ setaceous.*

CERAMBYX, LEPTURA, CANTHARIS, ELATER, CICINDELA, BUPRESTES, DYTISCUS, CARABUS, NECYDALIS, FORFICULA.

Order II. HEMIPTERA.

BLATTA, GRYLLUS, CICADA, NOTONECTA, NEPA, CIMEX, APHIS, CHERMES, COCCUS, THRIPS.

Order III. LEPIDOPTERA.

PAPILIO, SPHINX, PHALÆNA.

Order IV. NEUROPTERA.

LIBELLULA, EPHEMERA, PHRYGANEA, HEMEROBIUS, PANORPA, RAPHIDIA.

Order V. HYMENOPTERA.

CYNIPS, TENTHREDO, SIREX, ICHNEUMON, SPHEX, CHRYSIS, VESPA, APIS, FORMICA, MUTILLA.

Order VI. DIPTERA.

ŒSTRUS, TIPULA, MUSCA, TABANUS, CULEX, EMPIS, CONOPS, ASILUS, BOMBYLIUS, HIPPOBOSCA.

Order VII. APTERA.

The genera of the animals of this Order are already enumerated; any further observation will therefore be unnecessary.

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ON THE

DIVISION OF ANIMALS FROM THEIR ORGANIZATION.

It is the object of comparative anatomy to point out the difference which each organ presents when considered in every animal: but this exposition would prove very tedious and intricate, were we obliged at every step to enumerate all the animals in which particular organs have a uniform structure. It is certainly much more convenient to indicate them all at once under the name of a class or genus which may comprehend the whole: but to enable us to form this arrangement, it is necessary that all the animals which compose a genus or a class, should possess some resemblance not only in one, but in all their organs.

Nature never oversteps the bounds which the necessary conditions of existence prescribe to her: but whenever she is unconfined by these conditions, she displays all her fertility and variety. Never departing from the small number of combinations that are possible between the essential modifications of important organs, she seems to sport with infinite caprice in all the accessary parts. In these there appears no necessity for a particular form or disposition. It even frequently happens that particular forms and dispositions are created without any apparent view to utility. It seems sufficient that they should be possible; that is to say, that they do not destroy the harmony of the whole.

Among these numerous combinations there are necessarily many which have common parts, and there are always a certain number which exhibit very few differences. By the comparison therefore of those which resemble each other, we may establish a kind of series which will appear to descend gradually from a primitive type. These considerations are the foundations of the ideas from which certain naturalists have formed *a scale of beings*, the object of which is to exhibit the most perfect, and terminating with the most simple kind of organization—with that which possesses the least numerous and most common properties; so that the mind passes from one link of the chain to the other, almost without perceiving any interval, and, as it were, by insensible shades.

The object of system is to reduce a science to its simplest terms; by reducing the propositions it comprehends to the greatest degree of generality of which they are susceptible. A good method in comparative anatomy must, therefore, be such as will enable us to assign to each class and to each of its subdivisions, some qualities common to the greater part of the organs. This object is to be attained by two different means, which may serve to prove or verify one another. The first, and that to which all men will naturally have recourse, is to proceed from the observations of species to uniting them in genera, and

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to collecting them into a superior order, according as we find ourselves conducted to that classification by a view of the whole of their attributes. The second, and that which the greater part of modern naturalists have employed, is to fix beforehand upon certain bases of divisions, agreeably to which, beings, when observed, are arranged in their proper places.

The first mode cannot mislead us; but it is applicable only to those beings of which we have a perfect knowledge: the second is more generally practised, but it is subject to error. When the bases that have been adopted remain consistent with the combinations which observation discovers, and when the same foundations are again pointed out by the results deduced from observation, the two means are then in unison, and we may be certain that the method is good. On the anatomy of animals, science is most deeply indebted to the learned, acute, and indefatigable Cuvier, who has contributed more than all others, (save Hunter,) to our accurate knowledge of the characters on which the classes are founded. The whole animal kingdom is by Cuvier divided into four great types:—

1st. That of the animals which have their brain and the principal part of their nervous system inclosed within vertebræ, and their muscles attached to a bony skeleton. - - - - VERTEBROSA.

2dly. Those that have no skeleton; whose muscles are attached to their skin, and whose nervous system is irregular in its form and distribution. - - - - - - - - - MOLLUSCA.

3dly. Those that have no skeleton; whose muscles are attached to their skin, which is hard, or to processes proceeding from it; and whose nervous system consists of a series of knots or ganglia, brought into communication by two longitudinal nervous cords. - ANNULATA.

4thly. Those whose bodies are radiated, and in whom no nervous system has been discovered, and who have but one opening for the reception and rejection of their food. - - RADIATA or ZOOPHYTES.

The animals which come under my observations in this work, belong to the type *Annulata*, and the classes to which they belong may readily be distinguished by the following characters.

	Classes.
* *Gills for respiration.*	
Legs sixteen: antennæ two or four. - -	1. CRUSTACEA.
** *Sacs for respiration.*	
Legs twelve: antennæ none: - - -	3. ARACHNÖIDEA.
*** *Tracheæ for respiration.*	
a. *No antennæ.*	
- - - - - - -	4. ACARI.
b. *Two antennæ.*	
Six thoracic legs: abdomen also bearing legs: -	2. MYRIAPODA.
Six thoracic and no abdominal legs - -	5. INSECTA.

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Class I. *CRUSTACEA.*

History.—"All the *Crustacea*, as their name imports, are covered by integuments composed of crustaceous materials, more earthy than those which envelope the *Myriapoda*, the *Arachnöidea*, and *Insecta*. The greater portion of these animals live on putrid or decomposing animal substances, and in all the sexes are distinct."

To the kindness and liberality of my much respected friend Dr. Leach, I am indebted for the above passage and following review (which he has since published in the *eleventh volume of the Dictionnaire des Sciences Naturelles*) of the rise and progress of *Crustacea*; which is selected from his valuable manuscripts.

"The ancients were well acquainted with the *Malacostraca* (Μαλακοστρακοι), which they placed between the Mollusca and Fishes. Aristotle has dedicated a chapter to the species known to him; Athenæus has enumerated those used as food; and Hippocrates has made mention of such species as were considered to be useful in medicine. To the observations of Aristotle very little was added by Pliny; and from his time until that of Rondeletius, Belon, Gesner, Aldrovandus and Johnson, (who likewise placed them between the Mollusca and Fishes,) little or nothing was done that tends in any way to illustrate their natural history or structure. Linné, in the first (1735) and subsequent editions of his *Systema Naturæ*, placed all the *Crustacea* amongst the apterous insects, in the genera *Monoculus*, *Cancer*, and *Oniscus*.

"The *Crustacea* were arranged by Brisson (*Regnum Animale*) along with the *Myriapoda* and *Arachnöidea*, being placed between the Fishes and Insects, under the Class *Crustacea*.

"Fabricius in his *Systema Entomologiæ* (1775) distributed these animals into two Classes: 1. Syngnatha, comprehending *Monoculus* and *Oniscus*, which he associated with *Ephemera*, *Phryganea*, *Podura*, *Tenthredo*, and other genuine Insects: 2. Agonata, containing *Cancer*, *Pagurus*, *Scyllarus*, *Astacus*, and *Gammarus*, to which he also added *Scorpio*. The same author in his *Species* (1781) and *Mantissa Insectorum* (1787) maintained the same general distribution; adding in the former of those works the genus *Squilla*, and in the latter *Hippa*, removing in each work the genus *Scorpio* from the *Agonata*. In the second volume of his *Entomologia Systematica* (1793) his class *Syngnatha* contained only genuine Insects, the *Onisci* being removed to a new division named *Mitosata*, where they were associated with the *Myriapoda*; the rest he still placed with the *Agonata*, to which he added the genus *Limulus*, *Cymothoa* and *Galathea*.

"Latreille in his *Précis des Caractères des Insectes* (1796) (a work which commences a new æra in the science of Entomology, and in which, for the first time, the distribution of Insects into families is indicated), considered the *Crustacea* as forming three Classes or Orders

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of Insects: 1. Les *Entomostracés* (of Müller): 2. Les *Crustacés*: 3. Les *Myriapodes*.

"In that excellent little work *Le Tableau Elementaire de l'Histoire Naturelle des Animaux, par G. Cuvier* (1797), the *Crustacea* are arranged with the *Insecta*, *Arachnöidea*, and *Myriapoda*, under a division entitled '*Insectes pourvus de Máchoires, et sans Ailes*,' where they are placed at the head of the Insects, in a limited and well defined section (A.), which he afterwards, in his *Leçons d'Anatomie Comparée*, established on anatomical principles, as a distinct class, named *Crustacés*.

"In 1798 Fabricius published a Supplement to his last work, in which, by the aid of the Baron de Daldorff, he established several new genera, and amended the arrangement of the whole.

"Lamarck in his *Système des Animaux sans Vertèbres* (1801) adopted the *Crustacea* as a peculiar class. This system was adopted by

"Bosc, who in the same year published his *Histoire Naturelle des Crustacés faisant Suite à l'edition de Buffon par Castel*, in which for the first time we are made acquainted with his interesting genus *Zoëa*.

"Latreille in his *Histoire Naturelle des Crustacés et des Insectes*, tom. 3. (1802,) adopted the class *Crustacea*, and distributed the genera composing it into two subclasses: 1. *Entomostracés*: 2. *Malacostracés*: excluding however the *Tetracéres*, (*Asellidæ*, and *Oniscidæ*,) which he referred to a sub-class of Insects.

"Duméril (*Zoologie Analytique*, 1806) arranged these animals into 1. *Entomostracés*, and 2. *Astacoides*, excluding *Oniscus*, *Armadillo*, &c. which he placed with the apterous insects.

"Latreille in the same year produced his celebrated *Genera Crustaceorum et Insectorum*, where they are divided into *Entomostraca* and *Malacostraca*, the *Tetracera* being referred to the Insects.

"The same author in his *Considerations Générales*, &c. (1810) followed the same divisions, referring however the *Tetracera* to the *Arachnöidea*.

"In the seventh volume of the *Edinburgh Encyclopædia*, article '*Crustaceology*,' Dr. Leach distributed the *Crustacea* into three Orders: 1. *Entomostraca*: 2. *Malacostraca*: 3. *Myriapoda*: in which the *Tetracera* were included. In the Appendix, however, he divided the *Tetracera* from the *Myriapoda* (which he established as a distinct Class), and placed them with the *Malacostraca* in an Order named *Gasteruri*, where they were associated with the *Gammeridæ*, and considered the *Malacostraca* and *Entomostraca* as sub-classes. This opinion he has since maintained in a paper published in the eleventh volume of the *Transactions of the Linnean Society of London*, in the first volume of the Supplement to the *Encyclopædia Britannica*, and in the *Bulletin des Sciences* for 1816.

"Blainville in his *Prodrome d'une Nouvelle Distribution Systematique* (*Bull. des Sciences, &c.* 1816) has arranged the *Crustacea* into three Classes: 1. *Décapodes*: 2. *Heteropodes*: 3. *Tetradecapodes*."

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Class I. *CRUSTACEA.*

Classification.—The *Crustacea* form two large groups or subclasses. The first of these, the *Malacostraca*, have a pair of mandibles and two pair of maxillæ bearing palpi, and eight pair of legs furnished with branchiæ at their bases: all the genera that do not present the above characters are referred to the artificial assemblage denominated *Entomostraca.*

Subclass 1. Entomostraca—*Legs* branchial, or furnished with appendages: *mandibles* wanting or generally simple: *eyes* sessile or pedunculated.

Subclass 2. Malacostraca.—*Legs* simple, without appendages: *mandibles* palpigerous: *eyes* pedunculated or sessile.

Subclass 1. ENTOMOSTRACA.

The animals of this subclass are but little known, and consequently their arrangement is extremely imperfect. Some of the genera are parasitic, being found on the bodies of other animals, and some even undergo transformation during their growth.

The following arrangement is artificial, but is well calculated to enable the student to discover the Genera.

Division I.—*Body covered by a horizontal shield: eyes sessile.*

Subdivision 1.—*Shell composed of but one part.*

* *With jaws.*

Genus 1. APUS, *Cuvier, Latr., Leach.* Apos, *Scopoli.*

Shell crustaceous-membranaceous, orbiculate-ovate, behind deeply emarginate: the *back* (with the exception of the anterior part) carinated: *eyes* two, inserted at the anterior and middle part of the back; somewhat prominent, slightly lunate, approaching each other, especially anteriorly, where they touch each other: *antennæ* two, short, somewhat filiform, biarticulated, scarcely exserted, inserted behind the mandibles: *mandibulæ* two, corneous, somewhat cylindric, short, hollow within, points arcuated and compressed, the extreme apex straight and very much denticulated: *legs* branchial and very numerous.

The *Api* inhabit stagnant waters and ponds.

Sp. 1. *Ap. Montagui.* Carina of the shell produced into a point behind: anterior legs with articulated setæ: no lamella between the caudal setæ. *Encycl. Brit. Sup.* i. *Pl.* 20.

Inhabits England near Christchurch in Hampshire, where it was discovered by Montagu, and was named after him by Leach.

Apus productus of Latreille is synonymous with the Linnean *Monoculus Apus.*

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** *With a rostrum, but no jaws: antennæ two.*

Genus 2. CALIGUS, *Müll., Latr., Bosc, Leach.*

Shell coriaceous-membranaceous, bipartite; the anterior segment inversely cordiform, very deeply notched behind (the notch receiving the hinder segment, which is round), the anterior part subproduced, notched; the laciniæ at their base externally bearing antennæ: *antennæ* biarticulate, the first joint thickest, the second with a simple seta at its extremity: *abdomen* narrower than the thorax, with its base contracted and bearing the hinder legs, its extremity on each side with a rounded process of the length of the body: *rostrum* rounded, rather more slender towards its apex, which is obtuse: *legs* fourteen, anterior; second and fourth pairs with a strong claw; the second pair short; the third slender, elongate, the last joint double, with unequal laciniæ; the fifth, with the last joint on one side setose, the setæ ciliated on each side; the sixth with a double triarticulated tarsus, the last joints on each side setose, the setæ ciliated on each side; the seventh pair with its last joint trifid: the hinder segment of the *thorax* beneath, terminated by a large broad lamella, ciliated behind.

Sp. 1. *Cal. Mülleri.* Leach, Encycl. Brit. Supp., vol. 1. *Pl.* 20.

Inhabits the common cod-fish.

Genus 3. PANDARUS, *Leach.* CALIGUS, *Müll., Latr., Bosc.*

Shell coriaceous-membranaceous, composed of but one part, deeply notched behind; the angles acute; the middle of the notch toothed; anteriorly narrower, rounded, with a process on each side externally bearing the antennæ: *antennæ* composed of two joints, the second joint terminated by several setæ: *abdomen* somewhat narrower than the shell, the base above with two transverse lamellæ, the first of which is four-lobed, the second bilobate: the *apex* notched, with two filaments longer than the body, with a lamella at their base above: *rostrum* elongate, attenuated, inserted behind the anterior legs: *legs* fourteen; anterior pair short, terminated by a short claw, and arising from beneath an ovate process; second pair with a double, unequal tarsus; third pair without any determinate form, without any claw; fourth pair bifid; fifth and six pairs bifid, their coxæ connected by a lamella; seventh pair bifid, the exterior lacinia longest, with a notch externally towards its apex.

Sp. 1. *Pand. bicolor.* Shell and the middle of the abdominal lamellæ black; tail with filaments double the length of the body.

Pandarus bicolor. *Leach, Encycl. Brit. Supp.* vol. 1. *Pl.* 20.

Inhabits the *Squalus galeus* of Linné.

Genus 4. ANTHOSOMA, *Leach.*

Shell coriaceous-membranaceous, unipartite, rounded before and behind; the anterior part as if uni-lobate, the lobe higher than the shell, behind on each side, bearing the antennæ: *antennæ* six-jointed: *abdo-*

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men much narrower than the shell, on every side imbricated with membranaceous, foliaceous lamellæ, which surround or embrace it: two of the lamellæ are dorsal, the one being placed over the other; the other lamellæ are placed on the sides of the belly, three on each side; apex of the abdomen terminated by two very long filaments, and with two shorter filaments below them: *rostrum* elongato-cylindric, inserted behind the anterior legs, furnished at its extremity with two straight corneous mandibles: *legs* six; anterior pair three-jointed, the second joint near the apex above unidentate, the last terminated by a claw; second pair triarticulated, the last joint ovate, compressed; third pair biarticulate, the second joint very thick, internally dentated, armed at its extremity by a strong claw.

Sp. 1. *Anth. Smithii.* Leach, Encycl. Brit. Supp. vol. 1. *Pl.* 20.

This species was discovered sticking to a shark which was thrown ashore on the coast of Exmouth, in Devon, by T. Smith, esq.

Division II.—*Body covered by a bivalve shell: eyes sessile.*

Subdivision 1.—*Head porrected.*

Genus 5. DAPHNIA, *Müll., Latr., Bosc, Leach.*

Eye one only: *antennæ* two, branching.

Sp. 1. *Daph. Pulex.* Tail inflexed: shell mucronate behind.

Monoculus Pulex. *Linné, Fabr.*

Inhabits ponds and marshes.

Subdivision 2.—*Head concealed.*

Genus 6. CYPRIS, *Müll., Latr., Bosc, Leach.*

Antennæ terminated by a brush.

The animals of this genus inhabit pools and ditches containing pure water; they swim with very great rapidity, and whilst in motion conceal their whole body within their shell, which is truly bivalve.

Sp. 1. *Cyp. conchacea.* Shell ovate, tomentose.

Monoculus conchaceus. *Linn., Fabr.* Cypris pubera, *Müll.* Cypris conchacea, *Latr., Leach.*

Inhabits France, Germany, and England.

Genus 7. CYTHERE, *Müll., Latr., Bosc, Leach.*

Antennæ simply pilose.

This genus was first discovered and established by Müller, who first observed all the species described in his *Entomostraca.* It is distinguished from *Cypris* by the antennæ, which are not terminated by a pencil of hairs. The legs are eight in number, and are rarely drawn within the shell, which is really bivalve.

The *Cytheres* have no tail, and their antennæ, like those of the *Cyprides*, have their articulations pilose. They have but one eye. All the species inhabit the sea, and may be found among the *conferva*

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and corallines, which fill the pools left by the tide in most of the rocky coasts of Europe.

Sp. 1. *Cyth. viridis.* Shell reniform, velvety, and green.

Inhabits the European ocean. Is occasionally found on the shores of Scotland amongst *fuci* and *conferva*.

Division III.—*Body covered neither by a bivalve shell nor shield. Eye one, sessile.*

Genus 8. CYCLOPS. *Müll., Lam., Latr., Bosc, Leach.*

Body ovate-conic, elongate: *eye* one, situate on the thorax: *antennæ* four, simple: *legs* eight.

All the animals of this genus inhabit fresh waters. The females carry their eggs in a pouch resembling a bunch of grapes on each side of the tail. The organs of generation of the male are placed in the antennæ; those of the female, beneath the belly, at the base of the tail, which is abruptly narrower than the abdomen. The antennæ are hairy at the base of their joints.

Sp. 1. *Cyc. Geoffroyii.* Tail straight and bifid; colour brownish.

Monoculus quadricornis. *Linné, Fabr.* Cyclops quadricornis. *Müll., Latr., Bosc.* Cyclops Geoffroyii. *Leach.*

Genus 9. POLYPHEMUS. *Müll., Latr., Bosc, Leach.* CEPHALOCULUS. *Lamarck.*

Eye one, forming the head: *legs* ten; two bifid, elongate, and extended horizontally.

Sp. 1. *Pol. Oculus.* Body luteous, with a few blue spots.

The only species known of this genus. It inhabits lakes and marshes; and is subject to very considerable variation in size and colour.

Division IV.—*Body covered by neither a bivalve shell nor shield. Eyes pedunculated.*

Genus 10. BRANCHIOPODA. *Lam., Latr., Bosc, Leach.*

Body filiform and very soft: *head* divided from the thorax by a very narrow but distinct neck: *eyes* two, lateral: *antennæ* two, short, two-jointed, capillary, inserted behind and above the eyes: *front* with two moveable processes (which are broader towards the apex in the male sex), that are notched, those of the female furnished with a papilla at their point. The organs of generation are situate at the base of the tail.

Sp. 1. *Br. stagnalis.* Body transparent, of a light brown colour, slightly tinged with green or blue, particularly on the head and legs.

Cancer stagnalis. *Linné.*—An interesting account of this species is given by the late Dr. Shaw in the *Transactions of the Linnean Society of London*, vol. i.

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Subclass II. MALACOSTRACA.

A very valuable work is now publishing by Dr. Leach, in quarto, and illustrated with highly finished engravings, entitled, MALACOSTRACA PODOPHTHALMA BRITANNIÆ, in which the whole of the indigenous species hitherto discovered of this subclass are figured. It is necessary to state that this gentleman has spared neither pains nor expense to render the work complete, having with unexampled zeal and perseverance amassed together one of the finest collections ever formed, which is, with the remainder of his cabinet, consisting of insects, shells, &c. deposited in the British Museum, and, under certain restrictions, may always be consulted by students of Zoology.

Legion I. PODOPHTHALMA.

"The *Malacostraca Podophthalma* include those animals which, in common language, are denominated Crabs, Lobsters, Cray-fish, Prawns, Pandals, and Shrimps, all of which have the power of reproducing their claws when they are lost."

Order I. BRACHYURA.

A. *Abdomen of the male five-jointed, the middle joint longest; of the female seven-jointed. Anterior pair of legs didactyle. (Shell truncate behind. Two anterior legs of the male elongate, of the female moderate.)*

Fam. I. CORYSTIDÆ. *Leach.*

Antennæ long, ciliated on each side.

Genus 1. CORYSTES. *Latr., Leach.*

External antennæ longer than the body; the third segment composed of elongate, cylindric joints: *external double palpi* with the external footstalk narrow; the second joint largest, having its internal side deeply emarginate: *anterior pair of legs*, of the male twice the length of the body, subcylindric, the hand gradually somewhat thicker and somewhat compressed; of the female, of the length of the body, with a compressed hand: *other legs* with tibiæ and tarsi of equal length: *claws* elongate, straight, acute, and longitudinally sulcated: *abdomen*, of the male, with the first joint linear-transverse; the second longer, and produced on each side; third, nearly equally quadrate; the fourth transverse, and narrower than the third; the fifth narrower, nearly triangular, with the tip rounded; of the female, with six joints transverse, arcuated in front; seventh triangular, with the apex rounded: *shell* oblong-ovate, anteriorly slightly rostrated, behind margined:

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eyes not thicker than their bending-backward peduncles: *orbits* above with one fissure.

Sp. 1. *Cor. cassivelaunus.* Shell granulated, crenulated behind; front bifid; the sides tridentate.

Cancer cassivelaunus. *Penn. Brit. Zool.* iv. 6. *t.* 7. male and female. *Herbst*, i. 195. *t.* 12. *f.* 72. male. Cancer personatus. *Herbst*, 193. *t.* 12. *f.* 71. female. Alburnea dentata. *Fabr. Supp. Ent. Syst.* 398. *Bosc, Hist. Nat. des Crust.* ii. 4. Corystes dentatus. *Latr.* Corystes cassivelaunus. *Leach, Malac. Podoph. Brit. t.* 1.

Inhabits most of the sandy shores of the European ocean, and is often thrown up after heavy gales of wind.

Genus 2. ATELECYCLUS. *Leach, Latreille.*

External antennæ half the length of the body; the third segment composed of elongate and cylindric joints: *external double palpi* with the second joint of the internal footstalk shortest, with the internal apex produced, and the internal side notched towards the joint: *anterior legs* of the male longer than the body, with a compressed hand: *other legs* with tibiæ and tarsi of equal lengths, furnished with elongate, quadrate nails that are longitudinally sulcated, having their tips naked, rounded and sharp, the hinder ones obscurely subcompressed: *abdomen* of the male with the first joint transverse, linear, twice the length of the second; the third much elongated, narrower towards its extremity, the apex nearly straight; the fourth subquadrate, with the anterior angles produced; fifth flask-shaped, with a very sharp extremity; of the female, with the first five joints transverse quadrate, anteriorly notched; the last elongate, subtriangular behind, subproduced: *shell* subcircular, the sides gradually converging into an angle behind; hinder part truncate and granulate-margined: *eyes* narrower than their footstalks; orbits behind with two fissures, below, with one.

Sp. 1. *At. heterodon.* Shell granulated, the sides with seven serrulated teeth, and other smaller teeth between some of the other teeth: front with three serrulated teeth, the middle of which is the largest. *Leach, Malac. Podoph. Brit. tab.* 2.

This elegant crab was discovered by Montagu on the southern coast of Devon, where it is not an uncommon species in deep water. To the fishermen it is well known by the name of *Old Man's Face Crab.*

Fam. II. PORTUNIDÆ. *Leach.*

Antennæ moderate, simple: *hinder pair of legs* with compressed claws.

Genus 3. PORTUMNUS. *Leach.*

Eyes not thicker than their peduncles: *orbits* entire: *anterior pair of legs* equal: *other legs* with compressed claws, internally towards their base dilated: *fifth pair* with a compressed, foliaceous, lanceolate claw:

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abdomen of the male with the fourth joint elongate: *shell* with the transverse and longitudinal diameters the same.

Sp. 1. *Por. variegatus.* Shell obscurely granulated on each side, with five teeth, the second and third somewhat obsolete; front with three teeth; wrists internally with one tooth. *Leach, Malac. Podoph. Brit. t.* 4. male and female. Cancer latipes. *Penn. Brit. Zool.* iv. 3. *t.* 1. *f.* 4. female.

Planc first discovered this species on the shores of the Adriatic sea. It burrows beneath the sand, where it may be found by digging at low water, on most of our sandy shores.

When living it is most beautifully mottled, and the legs are of a luteous-orange colour.

Genus 4. CARCINUS. *Leach.*

Eyes narrower than their peduncles: *orbits* behind and beneath with one fissure: *anterior pair of legs* unequal, the hands externally smooth; *hinder pair* compressed, and slightly formed for swimming: *abdomen* of the male with the fourth joint transverse, and scarcely narrower than the third: *shell* with the transverse diameter greatest.

Sp. 1. *Car. Mænas.* Shell with five teeth on each side; front with three rounded teeth or lobes: hands with one tooth, wrist with a spine.

Cancer Mænas *of authors.* Car. Mænas. *Leach, Malac. Podoph. Brit. tab.* 5.

This most common species inhabits all the shores and estuaries of Britain. It burrows under the sand, or conceals itself beneath fuci and stones. It is sent to London in immense quantities, and is eaten by the poor.

Genus 5. PORTUNUS. *Fabr., Latr., Bosc, Lam., Leach.*

Eyes much thicker than their peduncles; *orbits* behind, with two fissures, below with one fissure: *abdomen* of the male with the fourth joint transverse: *anterior pair of legs* somewhat unequal, the hands externally with elevated lines, arms generally unarmed; *hinder pair* compressed, foliaceous, and formed for swimming: *shell* with the transverse diameter greatest; the sides with five, rarely with six, teeth.

* *Hinder claws with an elevated longitudinal line; external double palpi with the second joint of their internal footstalk truncate at their internal apex.*

a. *Orbits at the insertion of the antennæ imperfect. Wrists bidentate.*

Sp. 1. *Por. puber.* Antennæ half the length of the body: shell pubescent; front with many teeth.

Cancer puber. *Linné.* Cancer velutinus. *Penn. Brit. Zool.* iv. 8. *pl.* 4. *fig.* 8. Portunus puber. *Leach, Mal. Podoph. Brit. tab.* 6.

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Inhabits the southern coasts of Devon. In France it is used as an article of food.

b. *Orbit internally slightly imperfect. Wrists unidentate.*

Sp. 2. *Por. corrugatus.* Shell convex, with transverse serrate-granulate ciliated lines, the side with five teeth on each side, the three hinder of which are more acute; front trilobate, the lobes subgranulate-serrate, the middle one largest; hands above, unidentate; hinder claws with sharp points.

Cancer corrugatus. *Penn. Brit. Zool.* iv. *pl.* 5. *fig.* 9. Portunus corrugatus. *Leach, Trans. Linn. Soc.* xi. 315.—*Mal. Podoph. Brit. tab.* 7. *fig.* 1 *&* 2.

Inhabits the British seas.

** *Hinder claws without the elevated line. External double palpi with the internal apex of the second joint of the internal footstalk emarginate. Orbits internally beneath the insertion of the antennæ imperfect.*

Sp. 3. *Por. marmoreus.* Shell convex, obsoletely and slightly granulated, with five nearly equal teeth on each side; front with three equal teeth, with rounded points; hands smooth, with one tooth above; hinder tarsi with acute points.

Cancer (*pinnatus*) marmoreus. *Montagu's MSS.* Portunus marmoreus. *Leach, Malacost. Podoph. Brit. tab.* 8.

This elegant species, which derives its name from its colour, was discovered by G. Montagu, esq. It is very common on the sandy shores of southern Devon, from Torcross to the mouth of the river Ex, and is frequently found entangled in the shore-nets of the fishermen, or thrown on the shore after storms.

Fam. III. Cancridæ. *Leach's MSS.*

Antennæ simple, short: *four hinder pair of legs* simple.

Genus 6. CANCER *of authors.*

External antennæ short, inserted between the internal canthus of the eye and the front; *internal antennæ* placed in foveolæ in the middle of the clypeus, with their peduncle nearly lunate: *external double palpi* with the second joint of the internal footstalk notched at the internal apex: *shell* emarginate behind; *orbits* behind with one fissure, and externally with one fold: beneath with one fissure, and externally with one fold: *anterior pair of legs* unequal.

Sp. 1. *Can. Pagurus.* Shell granulated with nine folds on each side; front with three lobes.

This species is the common crab of Britain. It is considered to be in season between Christmas and Easter, and about harvest, being much esteemed as an article of food. Its natural history is but little known. During the summer months it is very abundant on all our rocky coasts, especially where the water is deep. At low tide they are often found in holes of rocks in pairs, male and female; and if

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the male be taken away, another will be found in the hole at the next recess of the tide. By knowing this fact, an experienced fisherman may twice aday take, with little trouble, a vast number of specimens, after having once discovered their haunts. In the winter they are supposed to burrow in the sand, or to retire to the deeper parts of the ocean. They are taken in wicker baskets, resembling mouse-traps, or in large nets with open meshes, which are placed at the bottom of the ocean and baited with garbage.

Genus 7. XANTHO. *Leach.*

External antennæ very short, inserted in the internal corner of the eye; *internal antennæ* received in a foveola under the prominent margin of the clypeus, the peduncle sublinear: *external double palpi*, with the second joint of the internal footstalk, notched at the internal apex: *shell* submargined behind: *orbits* entire above, below externally with one fissure: *anterior pair of legs* unequal.

Sp. 1. *Xan. florida.* Wrists above, with two tubercles: shell on each side with four obtuse teeth, the interstices cut out: fingers black.

Montagu, Trans. Linn. Soc. xi. 85. *t.* 2. *f.* 1. Cancer incisus. *Leach, Edin. Encycl.* vii. 391. Xantho incisa. *Leach, Edin. Encycl.* vii. 430. Xantho florida. *Leach, Trans. Linn. Soc.* xi. 320.—*Suppl. to Encycl. Brit.* —*Mal. Podoph. Brit. tab.* 11.

B. *Abdomen in both sexes seven-jointed. Two anterior legs didactyle.*

Division I. *Eight hinder legs simple, and alike in form.*

Fam. IV. PILUMNIDÆ. *Leach's MSS.*

Shell anteriorly arcuated, the sides converging to an angle: *two anterior legs* unequal.

Genus 8. PILUMNUS. *Leach.*

External double palpi with the second joint of the internal footstalk with the internal apex truncate emarginate: *claws* simple, with naked tips.

Sp. 1. *Pil. hirtellus.* Body and legs bristly: shell with five teeth on each side: claw somewhat muricated on the outside.

Cancer hirtellus. *Linn., Penn., Leach, Edin. Encycl.* Pilumnus hirtellus. *Leach, Suppl. to Encycl. Brit. Leach, Mal. Podoph. Brit. tab.* 12.

Inhabits the south coast of Devonshire.

Fam. V. OCYPODAIDÆ. *Leach's MSS.*

Shell quadrate or subquadrate: *eyes* inserted in the front.

* *Shell quadrate. Eyes with a long peduncle.*

Genus 9. PINNOTERES. *Latr., Bosc, Leach.* ALPHÆUS. *Daldorff.*

Antennæ very short (the first three joints largest), inserted in the interior corner of the eyes: *external double palpi*, with the internal foot-

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stalk, one-jointed: *anterior pair of legs* unequal: *eyes* thick: *shell* ovate-orbicular, orbiculate-quadrate, or transverse subquadrate.

All the species of this most interesting genus inhabit the bivalve shells of the acephalous *Mollusca*, and were supposed by the ancients to be consentaneous inmates with the animal, bound by mutual interest.

Aristotle supposed them to act as sentinels, and believed that they guarded the *Pinna* (the animal in whose shell they were first observed) from the attacks of its enemies. Rondeletius and some other naturalists held the same opinion.

Sp. 1. *Pin. Cranchii.* Shell orbiculate-subquadrate, soft, very smooth, with the sides dilated behind: front straight, obscurely subemarginate: hands oblong below, and the thighs above with a ciliated line: thumb subarcuate: abdomen very broad; the sides of the segment arcuate; the second and following ones distinctly notched; the fifth segment somewhat broader; the last narrower than the preceding segment. *Female.*

Pinnoteres Cranchii. *Leach, Malacost. Podoph. Brit. tab.* 14. *fig.* 4. 5.

The male of this species, which was discovered by Mr. J. Cranch, whose name it bears, is unknown. It is distinguished from *P. Pisum* (the common species) by the form of the front of the shell, which is straight, and slightly notched; by the dilated hinder part of the shell, and by the abdomen, all the joints of which, excepting the first, are distinctly notched behind.

*** Shell quadrate. Eyes with a long peduncle.*

Genus 10. GONOPLAX. *Leach.* Ocypoda. *Bosc.*

Eyes terminating their peduncle: *anterior pair of legs* equal; of the male very long; of the female twice the length of the body: *antennæ* half the length of the body, inserted at the internal canthus of the eyes.

The animals of this genus inhabit the ocean, preferring such parts as have a slimy bottom. They burrow laterally in the clay or slime, making two entrances to their hole; entering by one and going out by the other.

Sp. 1. *Gon. bispinosa.* Shell on each side with two spines: arms above, and wrists internally, with one spine.

Cancer angulatus. *Penn. Brit. Zool.* iv. *t.* 5. *f.* 10. *Fabr. Suppl. Entom. Syst.* 341. Ocypoda angulata. *Bosc, Hist. Nat. des Crust.* 1. 198. Gonoplax bispinosa. *Leach, Trans. Linn. Soc.* xi. 323.—*Edin. Encycl.* —*Supp. to Encycl. Brit.*—*Mal. Podoph. Brit. tab.* 13.

Inhabits the British sea. It is not uncommon at Salcombe and in Plymouth sound; and likewise occurs at Weymouth, and at Red Wharf in Anglesea.

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Division II.—*Shell rostrated in front. Eight hinder legs alike, and simple.*

Fam. VI.—Maïadæ. *Leach.*

Subdivision 1.—*Fingers deflexed.*

Genus 11. EURYNOME. *Leach.*

External antennæ rather long, with the first joint shorter than the second: *shell* verrucated, anteriorly terminated by a bifid rostrum with divaricating laciniæ: *eyes* distant, thicker than their peduncle which is of moderate length: *external double palpi* with the interior point of the second joint of their internal footstalks truncate-emarginate: *anterior legs* equal; of the male, three times the length of the body; of the female, longer than the body.

Sp. 1. *Eur. aspera.* Anterior legs and thighs tuberculated: shell with eight tubercles on the back that are more elevated than the others, which are irregular and margined with hairs; the sides with four lamellæ; rostrum with simple acuminate laciniæ.

Cancer aspera. *Penn. Brit. Zool.* iv. 8. Eurynome aspera. *Leach, Edin. Encycl.* vii. 431.—*Malac. Podoph. Brit. tab.* 17.—*Trans. Linn. Soc.* xi. 326.

Inhabits the British seas.

Subdivision 2.—*Fingers not deflexed. External antennæ with the first joint simple. Anterior pair of legs distinctly thicker than the rest.*

Genus 12. PISA. *Leach.* Blastus. *Leach, Edin. Encycl.*

External antennæ with clubbed hairs, the first joint longer than the second: *external double palpi* with the second joint of the internal footstalk with its internal apex truncate or emarginate: *claws* internally denticulated: *shell* villose; the laciniæ of the rostrum divaricating; *orbits* behind with two, below with one fissure.

* *Shell densely villose, the sides on each side behind terminated with a spine.*

Sp. 1. *Pisa Gibbsii.* Rostrum descending: shell with a spine behind the eyes on each side; arms and thighs simple.

Cancer biaculeatus. *Montagu, Trans. Linn. Soc.* xi. 2. *t.* 1. *f.* 1. Pisa biaculeata. *Leach, Edin. Encycl.* vii. 431. Pisa Gibbsii. *Leach, Linn. Trans.* xi. 327.—*Mal. Podoph. Brit. tab.* 19.

Inhabits deep waters on the coasts of Devon and Cornwall.

** *Shell villose, with spiny sides.*

Sp. 2. *Pisa tetraodon.* Shell on each side with six spines; two small, the rest larger.

Cancer tetraodon. *Penn. Brit. Zool.* iv. 7. *t.* 8. *f.* 15. Maja tetraodon. *Bosc, Hist. Nat. des Crust.* 1. 254. Blastus tetraodon. *Leach, Edin. Encycl.* vii. 431. Pisa tetraodon. *Leach, Trans. Linn. Soc.*—*Supp. to Encycl. Brit.* i. 415.—*Mal. Podoph. Brit. tab.* 20.

Inhabits the south-west coast of England.

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Subdivision 3.—*Fingers not deflexed. External antennæ with their first joint simple. Anterior pair of legs scarcely thicker than the others, which are moderately long.*

Genus 13. MAJA. *Lam., Latr., Bosc, Leach.*

External antennæ with the two first joints thickest, and of nearly equal length: *shell* convex ovate-subtriangular, very spiny: *eyes* not thicker than their elongate peduncle: *external double palpi* with the second joint of their internal footstalk deeply notched at its internal apex: *claws* with naked sharp points.

Sp. 1. *Maj. Squinado.* Shell fasciculate-pilose; orbit above, with one spine; the sides with five strong spines: clypeus beneath the front with a short spine excavated above.

Cancer Squinado. *Herbst*, iii. *t.* 56. (full grown.) *Id.* i. *t.* 14. *f.* 85. 84. junior. Cancer Maja. *Scopoli Entom. Carn.* 1126. *Sowerby's Brit. Miscell. t.* 39. Maja Squinado. *Latr. Gen. Crust. et Insect.* i. 37. *Bosc, Hist. Nat. des Crust.* i. 257. *Leach, Edin. Encycl.* vii. 394. 431. —*Trans. Linn. Soc.* xi. 326.—*Supp. to Encycl. Brit.* i. 415.—*Malac. Podoph. Brit. tab.* 18.

Inhabits the southern coasts of Devon and Cornwall. By the fishermen it is named Thornback or King-crab.

Subdivision 4.—*Fingers not deflexed. External antennæ with the first joint externally dilated.*

Genus 14. HYAS. *Leach, Supp. to Encycl. Brit.* i. 415.

Shell elongate-subtriangular, subtuberculated; the sides behind the eyes produced into a lanceolate projection: *rostrum* fissured, the laciniæ approximating: *external antennæ* with the first joint dilated, larger than the second: *external double palpi* with the second joint emarginate at the internal apex.

Sp. 1. *Hyas araneus.* The lastiform process behind the eyes tuberculated behind.

Cancer araneus. *Linn. Syst. Nat.* 1044. Cancer Bufo. *Herbst*, i. 142. *t.* 17. *f.* 59. Hyas araneus. *Leach, Edin. Encycl.* vii. 437.—*Trans. Linn. Soc.* xi. 329.—*Mal. Podoph. Brit. tab.* 21. a.

Inhabits the Scottish sea in great plenty; on the English coast it is more rare.

Subdivision 5.—*Second, third, fourth, and fifth pair of legs alike and slender.*

Genus 15. INACHUS. *Fabr., Leach.*

Shell slightly spined, with a spine on each side protecting the eye when retracted: *eyes* distant, scarcely thicker than their peduncles: *external double palpi* with the second joint of the internal footstalk truncate at its internal point: *external antennæ* with the three first joints

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thickest: *second pair of legs* thicker than the following ones: *claws* curved.

Sp. 1. *In. Dorsettensis.* Beak short, emarginate; the clypeus beneath produced into a spine: shell anteriorly, with four little tubercles placed transversely; then with three spines, the anterior one strongest; behind with three strong sharp spines, the middle one generally longest and strongest, forming a slightly recurved line; hinder margin with two distinct obsolete tubercles.

Cancer Dorsettensis. *Penn. Brit. Zool.* iv. 3. *pl.* 9. *fig.* 13. Cancer Scorpio. *Fabr. Sp. Inst.* i. 504. *Gmel. Syst. Nat.* i. 2078. *Herbst*, i. 237. 130. Inachus Scorpio. *Fabr. Ent. Syst. Supp.* 353. Macropus Scorpie. *Latr. Hist. Nat. des Crust. et des Insect.* vi. 109. Maja Scorpio. *Bosc, Hist. Nat. des Crust.* i. 252. Inachus Dorsettensis. *Leach, Edin. Encycl.* vii. 431.—*Malac. Podoph. Brit. tab.* 22. *fig.* 1—6.—*Trans. Linn. Soc.* xi. 330.

Inhabits the British seas.

C. *Abdomen in both sexes six-jointed. Two anterior legs didactyle.*

Fam. VII. LITHODIADÆ. *Leach's MSS.*

Fifth pair of *legs* minute, spurious.

Genus 16. LITHODES. *Latreille, Leach.*

External double palpi with narrow cylindric footstalks: *eyes* approximating at their base: *shell* very spiny, anteriorly rostrated.

Sp. 1. *Lith. Maja.* Legs and shell with sharp spines: beak spiny, with the tip bifurcate: fingers with tufts of hair.

Cancer Maja. *Linn. Syst. Nat.* 1046. Cancer horridus. *Penn. Brit. Zool.* iv. 7. *pl.* 7. *fig.* 14. Inachus Maja. *Fabr. Ent. Syst. Supp.* 358. Maja vulgaris. *Bosc, Hist. Nat. des Crust.* i. 251. Lithodes arctica. *Latr. Gen. Crust. et Insect.* i. 40. Lithodes Maja. *Leach, Edin. Encycl.* vii. 395.—*Trans. Linn. Soc.* xi. 332.—*Supp. to Encycl. Brit.* i. 416.—*Mal. Podoph. Brit. tab.* 24.

Inhabits the Northern sea, and in our seas is very rare, or at least very local; occurring only on the rocky shores of Yorkshire and of Scotland.

Fam. VIII. MACROPODIADÆ.

Second, third, fourth, and fifth pair of *legs* alike and slender. *Eyes* not retractile.

Genus 17. MACROPODIA. *Leach.* MACROPUS. *Latr.*

Shell slightly spined; beak long and fissured: *eyes* distant, subreniform, much thicker than their peduncles: *external antennæ* half the length of the body; the second joint three times the length of the third: *external double palpi* slender; the internal footstalk with the two equal

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joints: *palpi* very hairy, the middle joint shortest, the third a little longer than the first: *four anterior claws* with their tips bent: *four hinder ones* abruptly curved at their base.

Sp. 1. *Mac. Phalangium.* Beak acuminate, much shorter than the antennæ: shell behind the rostrum, with three tubercles placed in a triangle, the hinder tubercle largest: arms internally subscabrous and hirsute.

Cancer Phalangium. *Penn. Brit. Zool.* iv. 8. *pl.* 9. *fig.* 17. Macropus longirostris. *Latr. Gen. Crust. et Insect.* Macropodia longirostris. *Leach, Edin. Encycl.* vii.—*Zool. Misc.* ii. 18.—*Trans. Linn. Soc.* xi. 331. —*Mal. Podoph. Brit. tab.* 23.

Inhabits the mouths of rivers, and is very common in Great Britain.

D. *Abdomen of both sexes four-jointed. Two anterior legs didactyle.*

Fam. IX. LEUCOSIADÆ.

Genus 18. EBALIA. *Leach.*

Shell rhomboidal, produced in front; the sides entire: *anterior pair of legs* depressed, much larger than the rest; arms subangulated; fingers subdeflexed: *external pedipalpes* with their external footstalk linear: *abdomen* of the male with its last joint at its base furnished with a dentiform process.

Sp. 1. *Eb. Pennantii.* Shell granulated, with an irregular elevated cross: abdomen with 3—6 joints confluent.

Cancer tuberosus. *Penn. Orn. Zool.* iv. 8. *t.* 9. A. *f.* 19. Ebalia Pennantii. *Leach, Malac. Podoph. Brit. t.* 25. *f.* 1—6. ♂ & ♀.

Order II. MACROURA.

This Order contains the Families *Pagurii, Palinurini, Astacini,* and *Squillares* of Latreille.

Division I.—*Tail on each side with simple appendices.*

Fam. I. PAGURIDÆ. *Leach.*

Legs ten; anterior pair largest and dactyle.

Genus 19. PAGURUS. *Fabr., Latr., Bosc, Leach.*

External antennæ with the second joint of their peduncle with a moveable spine affixed to the apex above: *abdomen* membranaceous: *tail* three-jointed, crustaceous; the second joint on each side appendiculated: *four hinder legs* spurious, short, didactyle.

The curious economy of the genus *Pagurus* attracted the attention of the ancients. One species is well described by Aristotle.

All the species are parasitical, and inhabit the cavities of turbinated univalves. They all change their habitation during their growth, first occupying the smallest shells, and latterly those of very

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considerable dimensions. The abdomen is naked and slender, being covered merely with a skin of a delicate texture; but its extremity is furnished with appendages, by means of which it secures itself within the shell of which it makes choice. It is really astonishing with what facility these animals move, bearing at the same time the shell, which is destined to preserve the body from injury and to guard them from the attacks of fishes, which would otherwise devour them. All the species are termed indiscriminately Soldier-crabs and Hermit-crabs, from the idea of their living in a tent, or retiring to a cell.

Sp. 1. *Pag. Streblonyx* (common Soldier-crab). Arms hairy, muricated, the left largest; hands subcordate, fingers broad.

Cancer Bernhardus *of Pennant and other English authors.* Pagurus Streblonyx. *Mal. Podoph. Brit. tab.* 26. *fig.* 1 & 4.

Inhabits the European ocean, and is very abundant in the British seas, inhabiting various kinds of univalve shells, changing its habitation as it grows. Pagurus araneiformis, *Edinb. Encycl.* vii. 396, is merely the young of this species.

Division II.—*Tail on each side with foliaceous appendages, forming with the middle tail-process a fan-like fin.*

a. *Interior antennæ with very long footstalks.*

Fam. II. PALINURIDÆ. *Leach.*

External antennæ setaceous, and very long: *legs* ten, alike and simple.

Genus 20. PALINURUS. *Dald., Fabr., Lam., Latr., Bosc, Leach.*

The animals of this genus have the power of producing a sound by rubbing their exterior antennæ against the sides of the projecting clypeus.

Sp. 1. *Pal. vulgaris.*

Astacus Homarus. *Penn. Brit. Zool.* iv. 16. *pl.* 11. *Leach, Mal. Podoph. Brit. tab.* 30.

Inhabits the European ocean. It is commonly eaten in London, and is sometimes denominated Spiny-lobster or Sea Cray-fish.

Fam. III. GALATEADÆ.

External antennæ very long and setaceous: *legs ten,* anterior pair didactyle, fifth pair spurious.

Genus 21. PORCELLANA. *Lam., Latr., Bosc, Leach.*

External double palpi with the first joint of the internal footstalk dilated internally: *shell* orbiculate subquadrate.

Sp. 1. *Por. platycheles.* Anterior margin of the shell with three entire teeth: claws very large and much depressed: wrists internally denticulated; hands externally deeply ciliated.

Cancer platycheles. *Penn. Brit. Zool.* iv. 6. *pl.* 6. & 12. Porcellana platycheles. *Latr. Leach, Edin. Encycl.* vii.

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Inhabits the rocky shores of the southern and western coasts of Britain, concealing itself beneath stones, to the under side of which it adheres closely.

Genus 22. GALATEA. *Leach.* GALATHEA. *Fabr., Latr., Lam., Bosc, Leach.*

External double palpi with the internal edge of the first joint not dilated: *shell* ovate.

* *Rostrum acuminate, acute, with four spines on each side. Anterior legs compressed. Abdomen with the sides of the segments obtuse. Tail with the intermediate lamella triangular, the tip emarginate, the apex of the laciniæ rounded. Interior antennæ with the first joint of the peduncle trispinose.*

a. *Second joint of the internal footstalk of the external double palpi longer than the first.*

Sp. 1. *Gal. squamifera.* Anterior legs granulate-spinose: hands externally subserrated: wrists and arms internally spinose.

Galatea Fabricii. *Leach, Supp. to Encycl. Brit.* i. 419. *pl.* 21. Galathea squamifera. *Leach, Trans. Linn. Soc.* xi. 340.—*Mal. Podoph. Brit. tab.* 28. A.

b. *Second joint of the internal footstalk of the external double palpi shorter than the first.*

Sp. 2. *Gal. spinigera.* Anterior legs subgranulate squamose; above and on each side spinose: arms externally without spines.

Astacus strigosus. *Penn. Brit. Zool.* iv. 18. *pl.* 14. Cancer (*Astacus*) strigosus. *Herbst, tab.* 26. *f.* 2. Galathea strigosa. *Fabr., Latr., Leach.* Galathea spinigera. *Leach, Malac. Podoph. Brit. tab.* 28. B.

** *Rostrum elongate, spiniform; the base on each side bispinose. Anterior pair of legs subcylindric. Abdomen with the sides of the segments acute. Tail with the intermediate lamella transverse-quadrate; the apex subemarginate. Interior antennæ with the first joint of the peduncle four-spined. (External double palpi with the first joint of the internal footstalk longer than the second.)*

Sp. 3. *Gal. rugosa.* Anterior legs spinose, especially internally: abdomen with the second segment anteriorly with six; the third with four spines.

Astacus Bamffius. *Penn. Brit. Zool.* iv. 17. *pl.* 27. Galathea rugosa. *Fabr., Bosc, Latr.* Cancer rugosus. *Gmel. Syst. Nat.* i. 2985. Galathea longipeda. *Lam. Syst. des Anim. sans Vert.* 158. Galathea Bamffia. *Leach, Edin. Encycl.* vii. 398. Galathea rugosa. *Leach, Malac. Podoph. Brit. tab.* 29.—*Trans. Linn. Soc.* xi. 341.

Inhabits the European ocean and Mediterranean sea. It is very rare in Britain, but has been found on the Bamffshire coast and in Plymouth sound.

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b. *Interior antennæ with moderate footstalks.*

Fam. IV. Astacidæ. *Leach's MSS.*

Antennæ inserted in the same horizontal line, interior ones with two setæ, the exterior ones simple: *legs* for walking ten, anterior pair of these largest.

Stirps 1.—*Exterior lamella* of the tail composed of one part.

Genus 23. GEBIA. *Leach.*

Two anterior legs equal, subdidactyle, with the thumb short: *interior antennæ* with an elongate peduncle; the second joint shortest, the third largest and cylindric: *external double palpi* with the third joint of the internal footstalk shortest: *tail* with broad lamellæ; the exterior ones costated, the middle one quadrate.

Sp. 1. *Geb. Deltäura.* Abdomen with the back membranaceous: tail with the apex of the exterior lamella dilated and somewhat rounded; interior one truncate, and formed like the Greek delta.

Gebia deltaura. *Leach, Trans. Linn. Soc.* xi. 342.—*Mal. Podoph. Brit. tab.* 31. *fig.* 9, 10.

Inhabits beneath the sand on the southern coast of Devonshire, and is found by digging to the depth of two or three feet.

Genus 24. CALLIANASSA. *Leach.*

Four anterior legs didactyle; anterior pair largest, very unequal; second pair less; third pair monodactyle; fourth and fifth pairs spurious: internal antennæ with an elongate biarticulate peduncle, the second joint longest: *external double palpi* with the second joint of the internal footstalk largest and compressed: *tail* with broad lamellæ; the middle process elongate-triangular, with the apex rounded.

The thorax anteriorly abruptly subacuminate; the rostriform process divided from the shell by a suture: anterior pair of legs very much compressed, the hand articulated: the larger leg with the base of its wrist furnished with a curved process.

Sp. 1. *Cal. subterranea.* Shell with the rostriform process with one longitudinal ridge, the point rounded.

Cancer Astacus subterraneus. *Montagu, Trans. Linn. Soc.* xi. Callianassa subterranea. *Leach, Edin. Encycl.* vii. 400.—*Trans. Linn. Soc.* xi. 343.—*Supp. to Encycl. Brit.* i. 420.—*Malac. Podoph. Brit. tab.* 32.

This animal lives beneath the sand on the sea-shore. It was first described by Montagu, who found it by digging in a sand-bank in the estuary of Kingsbridge, on the southern coast of Devon.

Genus 25. AXIUS. *Leach.*

Four anterior legs didactyle; anterior pair largest, and somewhat unequal; third, fourth, and fifth pairs furnished with a compressed claw: *interior antennæ* with a three-jointed peduncle, the first joint longest: *external double palpi* with the two first joints somewhat large

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and unequal: *tail* broad; the intermediate lamella elongate-triangular.

Sp. 1. *Ax. Stirynchus.* Rostrum margined, the middle carinated: thorax behind the rostrum, with two elevated abbreviated lines notched behind.

Axius Stirynchus. *Leach, Trans. Linn. Soc.* xi. 343.—*Supp. to Encycl. Brit.* i. 420.—*Mal. Podoph. Brit. tab.* 38.

Inhabits the British sea.

STIRPS 2. *Exterior lamella* of the tail bipartite: *external antennæ* with a spine-shaped squame at the first joint of the peduncle: *anterior pair of legs* didactyle.

* *Eyes subglobose, not thicker than their peduncles.*

The coxæ of the third pair of legs of the female, of the fifth pair of the male, perforated. These perforations are for the passage of the semen and of the eggs; and although placed differently in other genera, yet they serve the same functions.

Genus 26. ASTACUS. *Leach's MSS.*

Abdomen with the sides of its segments obtuse: middle tail lamella composed of one piece.

Sp. 1. *Ast. Gammarus.* Rostrum on each side with four teeth, and with one on each side of its base.

Cancer Gammarus. *Linn. Syst. Nat.* i. 1050. Astacus Gammarus. *Penn. Brit. Zool.* iv. 9. *pl.* 10. Astacus marinus. *Fabr. Supp. Ent. Syst.* 406. *Latr. Gen. Crust. et Insect.* i. 51. Astacus Gammarus. *Leach, Edin. Encycl.* vii. 398.—*Trans. Linn. Soc.* xi. 344.—*Supp. to Encycl. Brit.* i. 420.

This species, which is the common lobster of our markets, inhabits deep clear water at the foot of rocks which hang over the sea. They breed during the early summer months, and are very prolific, Baxter having counted no less than 12,444 eggs under the abdomen. In warm weather they are very active; they have the power of springing backward in the water to a most astonishing distance into their holes in the rocks, as has been frequently observed by naturalists of credit. Their food consists of dead animal matter, and, it is said, also of sea-weed. The female is stated to deposit her eggs in the sand, but the young state is not known.

The common lobster inhabits the European ocean. It is found in very great abundance in the North of Scotland; but is much more common on the coast of Norway, from whence the London markets are for the most part supplied.

Genus 27. POTAMOBIUS. *Leach's MSS.*

Abdomen with the sides of its segments sharp: middle tail lamella bipartite.

Sp. 1. *Pot. fluviatilis.* Rostrum laterally dentated, the base with one tooth on each side.

Cancer Astacus. *Linn. Syst. Nat.* 1. 1051. Astacus astacus. *Penn.*

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Brit. Zool. i. 14. *pl.* 15. *fig.* 27. Astacus fluviatilis. *Fabr., Latr., Leach.*

** *Eyes reniform, abruptly shorter than their peduncles.*

The *coxæ* of the third pair of legs of the female, of the fifth pair of the male, perforated.

Genus 28. NEPHROPS. *Leach.*

External antennæ with the first joint of their peduncle furnished at its *apex* with a squama, which is produced beyond the apex of the peduncle.

Sp. 1. *Neph. Norvegicus.* Abdomen with hairy areolæ; shell somewhat spiny in front.

Cancer Norwegicus. *Linn. Syst. Nat.* i. 1053. Astacus Norwegicus. *Penn. Brit. Zool.* iv. 17. *pl.* 12. *fig.* 24. Nephrops Norwegicus. *Leach, Mal. Podoph. Brit. tab.* 36.

Inhabits the northern parts of Europe. It is found in the Frith of Forth during the summer months, often attaching itself to the lines of the fishermen: colour, when living, flesh red. Fabricius, Bosc, and Latreille, cannot have seen this animal, since they all describe it as having four instead of six didactyle legs.

Fam. V. PALÆMONIDÆ.

External antennæ with a large squama at their base.

STIRPS 1.—*External antennæ* inserted in the same horizontal line with the interior ones, which have two setæ: *tail* with the external lamella composed of but one part.

Genus 29. CRANGON. *Latr., Bosc, Leach.*

Second pair of legs didactyle, of the same length with the third pair: *pedipalpes* with their last joint obtuse at its point.

Sp. 1. *Cran. vulgaris.* Thorax behind the rostrum, and on each side, as well as the arms beneath with a spine.

Cancer *Crangon. Linné.* Crangon vulgaris. *Fabr., Leach, Mal. Pod. Br. t.* 37. B. Common Shrimp.

Genus 30. PONTOPHILUS. *Leach.*

Second pair of legs didactyle, much shorter than the third pair: *pedipalpes* with the last joint acuminated.

Sp. 1. *Pont. spinosus.* Thorax with five ranges of spines, disposed longitudinally; three ranges dorsal and one on each side.

Pontophilus spinosus. *Leach, Mal. Pod. Brit. t.* 37. A.

Discovered by C. Prideaux, esq., amongst some rubbish from Plymouth Sound; a second specimen was afterwards taken off Falmouth by the late John Cranch, Zoologist to the Congo Expedition.

STIRPS 2.—*External antennæ* inserted below the internal ones: interior ones with two setæ inserted in the same horizontal line: *exterior lamella* of the tail bipartite.

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Genus 31. PROCESSA. *Leach.* Nika. *Risso.*

Anterior pair of legs, with one side didactyle, the other armed with a simple claw: second pair unequal, didactyle, slender; one very long, with the wrists and fore arm many-jointed; the other shorter, with the wrists many-jointed; other legs terminated by simple claws.

Sp. 1. *Pro. canaliculata.* Base of the rostrum with one tooth; intermediate lamella of the tail longitudinally canaliculated.

Processa canaliculata. *Leach, Mal. Podoph. Brit. tab.* 41.

The thighs of the third and fourth pairs of legs are spinulose beneath; at the base of the rostrum there is an elevation dividing it from the thorax.

The above species, which forms the type of the genus, was discovered at Torcross, on the southern coast of Devon, by Montagu.

Stirps 3.—*External antennæ* inserted below the internal ones; interior ones with two setæ, one placed above the other. (*External lamella* of the tail composed but of one part.)

a. *Internal antennæ with the superior setæ excavated below. Claws spinulose.*

Genus 32. PANDALUS. *Leach.*

Anterior pair of legs adactyle; second pair didactyle, unequal. *External double palpi* with the last joint of the internal footstalk longer than the preceding joint.

Sp. 1. *Pan. annulicornis.* Rostrum ascending, many-toothed, apex notched; inferior antennæ annulated with red, and internally spinulose.

Pandalus annulicornis. *Leach, Malac. Podoph. Brit. tab.* 40.—*Trans. Linn. Soc.* xi. 346.—*Suppl. to Encycl. Brit.* i. 421.

Genus 33. HIPPOLYTE. *Leach.*

Four anterior legs didactyle: *external double palpi* with the last joint of the internal footstalk shorter than the preceding joint.

Sp. 1. *Hip. varians.* Rostrum straight, with two teeth above and below; shell above and beneath the eyes with one spine.

Hippolyte varians. *Leach, Trans. Linn. Soc.* xi. 347.—*Supp. to Encycl. Brit.* i. 421.—*Mal. Podoph. Brit. tab.* 38. *fig.* 6—16.

Inhabits the rocky shores of the south of Devon. It varies much in colour, being often found red, green, and blueish green.

b. *Internal antennæ with the superior seta not excavated. Claws simple.*

Genus 34. PENÆUS. *Fabr., Latr., Bosc, Leach.*

Six anterior legs didactyle: *external double palpi* with five exserted joints, the last of which is obtuse.

Sp. 1. *Pen. trisulcatus.* Thorax trisulcated behind; rostrum descending, multidentate above.

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Penæus trisulcatus. *Leach, Trans. Linn. Soc.* xi. 347.—*Supp. to Encycl. Brit.* i. 421.—*Mal. Podoph. Brit. tab.* 42.

Inhabits the Welsh Sea.

STIRPS 4.—*External antennæ* inserted below the internal; internal ones with three setæ. (*External lamella* of the tail composed of but one part.)

Genus 35. PALÆMON. *Fabr., Latr., Bosc, Leach.*

Four anterior legs didactyle: anterior pair smaller than the second pair; *external double palpi* with the last joint shorter than the preceding joint.

Sp. 1. *Pal. serratus* (*common Prawn*). Rostrum ascending above, with from six to eight teeth, the apex emarginate; below with from four to six teeth.

Astacus serratus. *Penn. Brit. Zool.* iv. 19. (*pl.* 16. *fig.* 28.) Cancer (*Astacus*) Squilla. *Herbst*, ii. 55. *tab.* 27. (*fig.* 1.) Palæmon Squilla. *Latr. Gen. Crust. et Insect.* i. 54. *Leach, Edin. Encycl.* vii. 401. Palæmon serratus. *Leach, Trans. Linn. Soc.* xi. 348.—*Supp. to Encycl. Brit.* i. 421.—*Mal. Podoph. Brit. tab.* 43. *fig.* 1—10.

Variety α. Rostrum with six teeth above.
Subvariety 1. Rostrum beneath with four teeth.
——— 2. ——— five teeth.

Variety β. Rostrum above with seven teeth.
Subvariety 1. Rostrum beneath with four teeth.
——— 2. ——— five teeth.
——— 3. ——— six teeth.

Variety γ. Rostrum with eight teeth above.
Subvariety 1. Rostrum beneath with four teeth.
——— 2. ——— five teeth.
——— 3. ——— six teeth.

"Although all the above varieties are common, yet β occurs most frequently. In some may be seen the upper edge of the rostrum with ten, the lower with five teeth; and both edges with but three teeth. The apex is generally notched above, and in two specimens, which may be considered a rare occurrence, the point has been found entire. The situation of the teeth on the upper edge is variable, but in most instances the second tooth is at a greater distance from the first than the rest, which are generally equidistant, and rarely extend far beyond the middle, the rostrum from that part being edentate, with the exception of the emarginate apex."

Herbst, Latreille, and Leach, formerly considered this species as *Cancer Squilla* of Linné; but Dr. L. has, since the publication of the error, met with the true *C. Squilla* of that author, and has de-

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scribed it in the eleventh volume of the *Transactions of the Linnean Society*, p. 348.

"*Palæmon serratus* of Fabricius is distinct, and, if his description be correct, it is not even referable to this genus; he having expressly given as its specific character '*Antennis posticis bifidis*,' (hinder antennæ bifid;) whereas, in his generic character, he has stated these organs to be trifid ('*Antennæ superiores trifidæ*.'")

Genus 36. ATHANAS. *Leach.*

Four anterior legs didactyle: anterior pair larger than the second pair: *external double palpi* with the last joint longer than the preceding joint.

Sp. 1. *Ath. nitescens.* Rostrum straight, and simple.

Cancer (*Astacus*) nitescens. *Montagu's MSS.* Athanas nitescens. *Leach, Trans. Linn. Soc.—Supp. to Encycl. Brit.—Mal. Podoph. Brit. tab.* 44.

Inhabits the southern coast of Devonshire.

Stirps 5.—*External antennæ* inserted below the internal: interior ones with a large scale at their base. *Legs* for movement sixteen.

Genus 37. MYSIS. *Latr., Leach.* Praunus. *Leach.*

Legs bifid, the last joint of the four anterior pairs with the interior *lacinia* uniarticulate, ovate, compressed; of the other pairs of legs multiarticulate: *external double palpi* with the middle joint of the internal footstalk longest, the first very short.

At the base of the abdomen of the female is situated the external uterus, composed of two valve-like membranes, in which the young ones, just excluded from the egg, live and grow until they become strong enough to take care of themselves.

The animals of this genus swim with their head uppermost, and with their eyes spreading, which gives them a singular and grotesque appearance.

* *Intermediate lamella of the tail emarginate.*

Sp. 1. *Mysis spinulosa.* Tail with the intermediate lamella externally spinulose; the apex acutely emarginate; exterior lamellæ acuminate, and very broadly ciliated.

Praunus flexuosus. *Leach, Edin. Encycl.* vii. 401. Mysis spinulosa. *Leach, Trans. Linn. Soc.* xi. 350.—*Supp. to Encycl. Brit.* i. 422.

Inhabits the Frith of Forth near Leith.

"Colour when alive, pellucid cinereous: eyes black, red at their base: *laminæ* of the external antennæ with a black longitudinal line and spots. A clouded spot on each side of the hinder part of the thorax, and another above the legs. Every segment of the body most beautifully marked with a reddish-rust coloured spot, disposed in an arborescent form; tail fin spotted with the same colour, mixed with black: pouch of the female with two rows of fuscous-black spots: under side of the abdomen regularly mottled with rufous black."

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It was observed with young from the middle of June to the middle of July. The females are one-third more abundant than the males.

Length an inch and a quarter.

*** Intermediate lamella of the tail entire.*

Sp. 2. *Mysis integra.*

Praunus integer. *Leach, Edin. Encycl.* vii. 401. Mysis integra. *Leach, Trans. Linn. Soc.* xi. 350.—*Supp. to Encycl. Brit.* i. 422.

Inhabits brackish pools of water, left by the tide at Lock Ranza in the Isle of Arran. Common in the month of August with young.

Length one third of an inch.

Females more abundant than the males. Colour whilst living pellucid cinereous, spotted with black and reddish brown.

Division III.—*Tail with two setæ, one on each side.*

Fam. VI. NEBALIADÆ. *Leach.*

Genus 38. NEBALIA. *Leach.*

Thorax anteriorly with a moveable rostrum: *anterior pair of legs* longest, simple; other pairs equal, approximate, with the last joint bifid: *antennæ* two, inserted above the eyes, the last joint bifid and multiarticulate.

Sp. 1. *Neb. Herbstii.* Gray or cinereous-yellowish; eyes black.

Cancer bipes. *Oth. Fabr. Fn. Grön.* no. 223. *fig.* 2. *Herbst*, ii. *tab.* 24. *fig.* 7. Mysis bipes. *Latr. Hist. Nat. des Crust. et des Insect.* vi. 285. Monoculus rostratus. *Montagu, Trans. Linn. Soc.* xi. 14. *tab.* 2. *fig.* 5. Nebalia Herbstii. *Leach, Zool. Miscel.* i. 100. *tab.* 44.—*Trans. Linn. Soc.* xi. 351.—*Supp. to Encycl. Brit.* i. 422.

Inhabits the European Ocean; it is common beneath stones lying on black mud, on the southern coast of Devon.

Genus of doubtful situation.

Genus 39. MEGALOPA, *Leach.*

The situation of this curious genus, which is figured in Dr. Leach's *Malacostraca Brit.* (*tab.* 25.), is still doubtful. It however decidedly belongs to the MACROURA, as Dr. L. has discovered to be the case, since the publication of the first volume of the *Supp. to Encycl. Brit.*

Legion II. EDRIOPHTHALMA.

The *Malacostraca Edriophthalma*, or at least a greater part of them, were placed amongst the MACROURA by Latreille, who considered them as forming a particular family of that order.

Section I.

Body laterally compressed.

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Fam. I. Phronymadæ. *Leach's MSS.*

Legs fourteen: *antennæ* two, inserted one on each side of the front of the head. (*Tail* furnished with styles.)

Genus 1. PHRONYMA. *Latr., Leach, Lamarck.*

Head large, nutant: *antennæ* biarticulate, the first joint small: *thorax* seven-jointed, all its segments bearing legs: *legs* compressed, *two anterior* pairs with the antepenultimate joint furnished at its point with a foliaceous process; the penultimate joint with the point bifid and terminated with a small claw: *third* and *fourth pairs* simple, longer, somewhat thicker, terminated by a bent claw: *fifth pair* large, very long, thicker, didactyle; the first joint gradually thickened towards its point; the second subtrigonate; the third ovate, and abruptly narrowed at its base; the last narrowed at its base; the fingers curved, and internally furnished each with one tooth: *sixth* and *seventh pairs* simple, terminated with a nearly straight claw: *abdomen* triarticulate, each segment, on each side, with a double appendice, placed on a peduncle: *tail* biarticulate, the first joint on each side furnished with a biarticulate process, terminated by two styles; second joint with four processes, each terminated by two styles; the inferior processes biarticulate, the superior triarticulate.

Sp. 1. *Phron. sedentaria.* Fifth pair of legs with the apex of the thumb and base of the fingers internally denticulated.

Cancer sedentarius. *Forsk. Fn. Arab.* 95. Phronyma sedentaria. *Latr. Gen. Crust. et Ins.* i. 57. *Leach, Edin. Encycl.* vii. 403—433.—*Trans. Linn. Soc.* xi. 355. Cancer (Gammarellus) sedentarius. *Herbst*, ii. 136. *t.* 37. *fig.* 8.

Inhabits the Mediterranean Sea and Zetland Sea, residing in a cell composed of a gelatinous substance, open at each extremity, where it sits in an incurved posture.

The only specimen of this most interesting, rare, and curious animal was taken by the Reverend Dr. J. Fleming, one of our most zealous naturalists, who found it on the 3d of November 1809, at Burray in Zetland, amongst rejectamenta of the sea, and communicated it to Dr Leach.

Fam. II. Gammaridæ. *Leach's MSS.*

Body laterally compressed: *legs* fourteen, with lamelliform coxæ: *antennæ* four, inserted by pairs. (*Tail* furnished with styles.)

Stirps 1.—*Antennæ* four-jointed, the last segment composed of many little joints; the upper ones very short.

Genus 2. TALITRUS. *Latr., Bosc, Leach.*

Four anterior legs in both sexes subequal, monodactyle: *upper antennæ* shorter than the two first joints of the under ones.

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Sp. 1. *Tal. Locusta.* Antennæ subtestaceous-rufous, of the male longer than the body, of the female shorter; body cinereous, varied with darker cinereous.

Oniscus Locusta. *Pallas?* Talitrus Locusta. *Latr., Bosc, Leach.* Astacus Locusta. *Penn. Brit. Zool.* iv. 21. Cancer (*Gammarus*) Saltator. *Montagu, Trans. Linn. Soc.* xi. 94.

Inhabits the sandy shores of the European Ocean.

The specific name *Locusta* is probably derived from the form of its protruded mouth, which has a general resemblance to the same part in the GRYLLIDES.

It has never been observed in the water; it burrows in the sand, and leaps about on the shore. *Talitrus littoralis*, described in the seventh volume of the *Edinburgh Encyclopædia*, is merely the female of *T. Locusta.*

The use of this animal (which is generally denominated Sand-hopper) in the economy of nature, appears to be that of contributing to the dissolution of putrid animal and vegetable matter; serving in return as food to the shore birds, who devour it with avidity.

Genus 3. ORCHESTIA. *Leach.*

Four anterior legs of the male monodactyle; second pair with a compressed hand; of the female, with the anterior pair monodactyle, the second didactyle: *upper antennæ* not longer than the two first joints of the under ones.

Sp. 1. *Orc. littorea.*

Cancer *Gammarus* littoreus. *Montagu, Trans. Linn. Soc.* xi. 96. Orchestia littorea. *Leach, Edin. Encycl.* vii. 402. *pl.* 21. *fig.* 6.—*Trans. Linn. Soc.* xi. 356.—*Supp. to Encycl. Brit.* i. 424.

Inhabits many of our shores, and is found at the mouths of rivers, but has never been observed in the water. It resides under stones and fuci, and in the evening it leaps about and is devoured by birds.

STIRPS 2.—*Antennæ* four-jointed, the last joint composed of several little joints; upper ones rather shortest.

Genus 4. DEXAMINE. *Leach.*

Four anterior legs sub-equal, monodactyle, furnished with a filiform-subovate hand: *antennæ* with their first joint shortest: *eyes* oblong, not prominent, inserted behind the superior antennæ: *tail* on each side with three double styles, and above on each side with one moveable style.

Sp. 1. *Dex. spinosa.* Segments of the abdomen behind, produced into spines.

Cancer (Gammarus) spinosus. *Montagu, Trans. Linn. Soc.* xi. 3. Dexamine spinosa. *Leach, Edin. Encycl.* vii. 433.—*Zool. Miscel.* ii. 24.—*Trans. Linn. Soc.* xi. 359.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the sea of the western coasts of Britain.

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Genus 5. LEUCOTHÖE. *Leach.*

Anterior pair of legs didactyle; the thumb biarticulate: *second pair* with a dilated and compressed hand, furnished with a crooked thumb.

Sp. 1. *Leu. articulosa.*

Cancer articulosus. *Montagu, Trans. Linn. Soc.* vii. 71. *t.* 6. *f.* 6. Leucothöe articulosa. *Leach, Edin. Encycl.* vii. 403.—*Trans. Linn. Soc.* xi. 358.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the British sea, but is very rare.

STIRPS 3.—*Antennæ* four-jointed, the last segment composed of several little joints; upper ones longest.

Subdivision 1.—*Four anterior legs monodactyle, second pair with a much dilated compressed hand.*

Genus 6. MELITA. *Leach.*

Anterior pair of legs monodactyle; second pair with the thumb inflexed on the palm: *tail* on each side with an elongate foliaceous lamella.

Sp. 1. *Mel. palmata.* Body blackish: antennæ and legs annulated with pale colour.

Cancer palmatus. *Montagu, Trans. Linn. Soc.* vii. 69. Melita palmata. *Leach, Edin. Encycl.* vii. 403.—*Trans. Linn. Soc.* xi. 358.—*Supp. to Encycl. Brit.* i. 425. *pl.* 21.

Inhabits the sea shore on the Devonshire coast under stones.

Genus 7. MÆRA. *Leach.*

Four anterior legs didactyle; thumb of the second pair bent on the side of the hand: *tail* with no foliaceous appendices.

Sp. 1. *Mæ. grossimana.*

Cancer *Gammarus* grossimanus. *Montagu, Trans. Linn. Soc.* ix. 97. *t.* 4. *f.* 5. Mæra grossimana. *Leach, Edin. Encycl.* vii. 403.—*Trans. Linn. Soc.* xi. 359.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the southern coast of Devonshire beneath stones.

Subdivision 2.—*Two anterior pair of legs monodactyle and alike.*

Genus 8. GAMMARUS. *Latr., Leach.*

Superior antennæ furnished at the base of the fourth joint with a little jointed seta: *tail* above with bundles of spines.

* *Tail with the superior double styles, having the upper style process very short.*

Sp. 1. *Gam. aquaticus.* Process between the antennæ rounded, obtuse.

Gammarus Pulex. *Leach, Edin. Encycl.* vii. 402—432. Gammarus aquaticus. *Leach, Trans. Linn. Soc.* xi. 359.—*Supp. to Encycl. Brit.* i. 425.

Inhabits ponds, ditches, and springs in great plenty.

Sp. 2. *Gam. marinus.* Process between the antennæ subacuminate.

Gammarus marinus. *Leach, Trans. Linn. Soc.* xi. 359.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the sea on the southern coast of Devonshire in plenty.

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** *Tail with the superior double styles, having the style processes subequal.*

Sp. 3. *Gam. Locusta. Eyes* lunate.

Cancer *Gammarus* Locusta. *Montagu, Trans. Linn. Soc.* ix. 92. Gammarus Locusta. *Leach, Edin. Encycl.* vii. 403.—*Trans. Linn. Soc.* xi. 359.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the British sea.

Sp. 4. *Gam. Camptolops. Eyes* flexuous.

Gammarus Camptolops. *Leach, Edin. Encycl.* vii. 403.—*Trans. Linn. Soc.* xi. 360.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the sea about Loch Ranza, in the Isle of Arran.

Genus 9. AMPITHÖE. *Leach.*

Superior antennæ with no seta at the base of their fourth joint: *tail* simple above: *hands* ovate.

Sp. 1. *Am. rubricata.*

Cancer *Gammarus* rubricatus. *Montagu, Trans. Linn. Soc.* ix. 99. Gammarus rubricatus. *Leach, Edin. Encycl.* vii. 402. Ampithöe rubricata. *Leach, Edin. Encycl.* vii. 432.—*Trans. Linn. Soc.* xi. 360.—*Supp. to Encycl. Brit.* i. 425.

Inhabits the sea of the southern coast of Devon.

Genus 10. PHERUSA. *Leach.*

Superior antennæ with no seta at the base of their fourth joint: *tail* simple above: *hands* filiform.

Sp. 1. *Phe. Fucicola.* Testaceous-cinereous or gray cinereous mottled with reddish.

Pherusa Fucicola. *Leach, Edin. Encycl.* vii. 432.—*Trans. Linn. Soc.* xi. 360.—*Supp. to Encycl. Brit.* i. 426. *pl.* 21.

Inhabits fuci on the southern coast of Devon.

Stirps 4. *Antennæ* four-jointed; under ones longest, leg-shaped. (*Four anterior legs* monodactyle.)

Subdivision 1.—*Second pair of legs with a large hand.*

Genus 11. PODOCERUS. *Leach.*

Eyes prominent: *four anterior legs* monodactyle.

Sp. 1. *Pod. variegatus.* Body varied with red and white.

Podocerus variegatus. *Leach, Edin. Encycl.* vii. 433.—*Trans. Linn. Soc.* xi. 361.—*Supp. to Encycl. Brit.* i. 426.

Inhabits the southern coast of Devonshire, amongst confervæ and corallines.

Genus 12. JASSA. *Leach.*

Eyes not prominent: *four anterior legs* monodactyle, with oval hands; second pair with its internal edge dentated.

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Sp. 1. *Jas. pulchella.* Thumb of the second pair of legs with its internal edge notched at the base; colour white painted with red.

Var. α. Hands of the second pair with an elongate obtuse tooth.

Var. β. Hands of the second pair with the internal edge tridentate.

Jassa pulchella. *Leach, Edin. Encycl.* vii. 433.—*Trans. Linn. Soc.* xi. 361.—*Supp. to Encycl. Brit.* i. 426.

Inhabits the sea of southern Devon amongst fuci.

Subdivision 2.—*Second pair of legs with a moderate-sized hand.*

Genus 13. COROPHIUM. *Latr., Leach.*

Sp. 1. *Cor. longicorne.*

Cancer grossipes. *Linn. Syst. Nat.* i. 1055. Astacus grossipes. *Penn. Brit. Zool.* iv. *pl.* 16. *fig.* 31. Corophium longicorne. *Latr. Gen. Crust. et Insect.* i. 59. *Leach, Edin. Encycl.* vii. 403—432.—*Trans. Linn. Soc.* xi. 662.—*Supp. to Encycl. Brit.* i. 426.

Inhabits the coast of the European ocean. At low tide it may be observed crawling amongst the mud. It is very common at the mouth of the river Medway, where it was first observed by J. Henslow, esq.

Section II.

Body depressed: antennæ four: legs fourteen.

A. *Tail without appendices.*

Fam. III. CAPRELLADÆ. *Leach.*

Body with all the segments bearing legs,

STIRPS 1. *Body* linear.

Genus 14. PROTO. *Leach.*

Second, third, and fourth pair of legs appendiculated at their bases.

To this genus belongs *Squilla pedata*, and probably also *ventricosa* of Müller, with *Cancer Gammarus pedatus* of Montagu, which is probably the same with *S. pedata* of Müller. See *Transactions of the Linnean Society*, vol. xi. p. 6. *t.* 11. *f.* 6.

Genus 15. CAPRELLA. *Lamarck, Latr., Bosc, Leach.*

Second, third, and fourth pairs of legs not appendiculated at their bases; the third and fourth pairs spurious, subgelatinous, and globose.

The animals composing this genus inhabit the sea, living amongst Sertulariæ and marine plants, moving geometrically like the larvæ of the *Phalænadæ*.

The specific character may be taken from the number and situation of the spines on the head and back, form of the second pair of legs, &c.

Sp. 1. *Cap. Phasma.* Hands of the second pair of legs narrow, their internal edge acutely notched backwards: back anteriorly with three spines, turning forwards.

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Cancer Phasma. *Montagu, Trans. Linn. Soc.* vii. 66. *t.* 6. *f.* 3. *Leach, Supp. to Encycl. Brit.* i. 426.

Inhabits the southern coast of Devon.

Astacus atomos of Pennant and *Squilla lobata* of Müller belong to the genus *Caprella*, of which in the British Museum there are several undescribed species.

STIRPS 2. *Body* broad.

Genus 16. LARUNDA. *Leach.* CYAMUS. *Latr., Bosc.* PANOPE. *Leach.*

Antennæ four-jointed, upper ones longest: *legs* compressed, with strong claws; the third and fourth pairs elongate, spurious, cylindric, without claws; the two anterior pairs monodactyle.

External uterus, or pouch of the female, composed of four valves.

Sp. 1. *Lar. Ceti.* Bases of the third and fourth pairs of legs with processes resembling the figure 6; the hands of the second pair of legs anteriorly, with three obtuse teeth.

Oniscus Ceti. *Linn. Syst. Nat.* i. 1060. *Pall. Spec. Zool.* ix. 4. *f.* 14. Squille de la Baleine. *De Geer, Mém. sur les Insect.* vii. *pl.* 42. *f.* 6, 7. Pycrogonum Ceti. *Fabr. Supp. Ent. Syst.* 570. Cyamus Ceti. *Latr. Gen. Crust. et Insect.* i. 60. Panope Ceti. *Leach, Edin. Encycl.* vii. 404. Larunda Ceti. *Leach, Trans. Linn. Soc.* xi. 364.—*Supp. to Encycl. Brit.* i. 426. *pl.* 21.

Inhabits whales, and according to Latreille it is also found on some species of the genus *Scomber*.

By the Greenland fishermen it is termed the Whale-louse.

Fam. IV. IDOTEADÆ. *Leach.*

Body with all the segments not bearing legs: (*ventral* appendages covered by two longitudinal plates.)

Genus 17. IDOTEA. *Fabr., Latr., Bosc, Leach.* ASELLUS. *Olv., Lamarck.* ENTOMON. *Klein.*

External antennæ half the length of the body, or less; the third and fourth joints equal: *body* ovate.

Sp. 1. *Id. pelagica.* Body linear-oval: tail rounded, the middle with a very obsolete tooth: antennæ one third of the length of the body.

Idotea pelagica. *Leach, Trans. Linn. Soc.* xi. 365.—*Supp. to Encycl. Brit.* i. 426.

Inhabits the Scottish seas.

Colour when alive ash-gray or fuscous, speckled with darker colour, and often variegated or mottled with white spots: legs pale.

The female seems to be very rare, as amongst 400 specimens of the animal, one only of that sex was found.

Length one inch and a quarter.

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Genus 18. STENOSOMA. *Leach.*

External antennæ as long as the body, the third joint longer than the fourth: *body* linear.

Sp. 1. *St. lineare.* Last segment of the tail somewhat narrowed at its base, and dilated towards its apex, which is truncate and notched.

Oniscus linearis. *Penn. Brit. Zool.* iv. *pl.* 18. *fig.* 2. Idotea hectica. *Leach, Edin. Encycl.* vii. 404. Stenosoma hecticum. *Leach, Edin. Encycl.* vii. 433. Stenosoma lineare. *Leach, Trans. Linn. Soc.* xi. 366. —*Supp. to Encycl. Brit.* i. 427.

Inhabits the European ocean. It sometimes occurs in the Firth of Forth, and amongst the Hebrides.

B. *Tail on each side, with one or two appendices.*

Fam. V. ANTHURADÆ. *Leach.*

Antennæ inserted in nearly the same horizontal line: ventral appendages closed by two longitudinal plates.

Genus 19. ANTHURA. *Leach.*

Antennæ short, subequal; inserted one after another in the same horizontal line, the internal ones a little longest: *body* linear: *tail* with the last joint but one very short; the last elongate, narrower, with two elongate lamellæ on each side.

Sp. 1. *An. gracilis.* Lateral processes of the tail obliquely truncated.

Oniscus gracilis. *Montagu, Trans. Linn. Soc.* ix. *tab.* 5 & 6. Anthura gracilis. *Leach, Edin. Encycl.—Trans. Linn. Soc.—Supp. to Encycl. Brit.*

Fam. VI. CYMOTHOADÆ. *Leach.*

Antennæ inserted in pairs, one above the other.

STIRPS 1. *Tail* with one lamella on each side.

Genus 20. CAMPTECOPEA. *Leach.*

Tail with its last segment furnished on each side with a compressed, curved appendage: *body* six-jointed, the last joint of the same size with the others: *antennæ* setaceous, upper ones longest, their peduncle biarticulate, the space between the antennæ very great: *anterior claws* bifid.

Sp. 1. *Cam. hirsuta.* Brown; the last joint of the body with a few faint blueish spots.

Oniscus hirsutus. *Montagu, Trans. Linn. Soc.* vii. *t.* 6. *f.* 8. Camptecopea hirsuta. *Leach, Trans. Linn. Soc.* xi. 367.—*Edin. Encycl.* vii. 405. —*Supp. to Encycl. Brit.* i. 427.

Inhabits the southern coast of Devonshire, but is rather rare.

Length one eighth of an inch.

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Genus 21. NÆSA. *Leach.*

Tail on each side of the last segment, with a straight subcompressed process attached to a peduncle: *body* six-jointed, the last joint largest: *antennæ* setaceous, subequal; upper ones with a very large biarticulated peduncle, the first joint largest: space between the antennæ easily to be discerned: *claws* bifid.

Sp. 1. *Næ. bidentata.* Last segment of the body armed with two spines or teeth; colour cinereous, faintly streaked with blue, or reddish.

Oniscus bidentatus. *Adams, Trans. Linn. Soc.* v. 8. *t.* 2. *f.* 3. Næsa bidentata. *Leach, Edin. Encycl.* vii. 405.—*Trans. Linn. Soc.* xi. 367.—*Supp. to Encycl. Brit.* i. 427.

Inhabits the coasts of Wales and Devonshire.

STIRPS 2. *Tail* with two lamellæ on each side.

* *Superior antennæ with a very large peduncle. Claws bifid.*

Genus 22. CYMODICE. *Leach.*

Eyes touching the anterior margin of the first segment of the body: *body* seven-jointed: *tail* at the base, on each side with two subcompressed but not foliaceous appendages, the exterior ones largest; the apex of the tail notched, with a lamella in the centre: *claws* bifid.

Sp. 1. *Cy. truncata.* Apex of the tail truncate.

Oniscus truncatus. *Montagu's MSS.* Cymodice truncata. *Leach, Edin. Encycl.* vii. 433.—*Trans. Linn. Soc.* xi. 303.—*Supp. to Encycl. Brit.* i. 427.

This species is very rare, and has been found but three times on the southern coast of Devonshire.

Genus 23. DYNAMENE. *Leach.*

Eyes not reaching to the anterior margin of the first segment of the body: *body* seven-jointed: *tail* with two equal foliaceous appendages on each side of its base; the apex notched: *claws* bifid.

Dynamene. *Leach, Edin. Encycl.* vii. 433.

There are several indigenous species of this genus, and their characters will be given under the article CYMOTHOADE'ES, in the *Dictionnaire des Sciences Naturelles,* by Dr. Leach.

Genus 24. SPHÆROMA. *Latr., Leach.*

Eyes not reaching to the anterior margin of the first segment of the body: *body* seven-jointed: *tail* with its apex entire; the base on each side with two equal foliaceous appendages: *claws* bifid.

Sp. 1. *Sph. serrata.* Body smooth, unarmed: tail very smooth on each side; obliquely truncated: lamellæ elliptic, acute, the external ones externally serrated.

Oniscus Globator. *Pall. Spec. Zool. fasc.* ix. *t.* 4. *f.* 18. Cymothea serrata. *Fabr. Ent. Syst.* ii. 510. Sphæroma cinerea. *Latr. Gen. Crust.*

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et Insect. i. 65. Sphæroma serrata. *Leach, Edin. Encycl.* vii. 405. —*Trans. Linn. Soc.* xi. 303.—*Supp. to Encycl. Brit.* i. 427.

** *Superior antennæ with a very large peduncle. Claws simple.*

Genus 25. ÆGA. *Leach.*

Eyes large, granulated, oblong, oblique, marginal: *tail* with its appendages foliaceous.

Sp. 1. *Æga emarginata.* Tail with the last joint acuminate; the interior lamella internally obliquely truncated, externally emarginated.

Æga emarginata. *Leach, Trans. Linn. Soc.* xi. 370.—*Supp. to Encycl. Brit.* i. 427. *pl.* 21.

*** *Superior antennæ with a moderate peduncle.*

Genus 26. EURYDICE. *Leach.*

Eyes distinct, simple, lateral: *head* as broad as the first segment of the body.

Sp. 1. *Eu. pulchra.* Tail with the last joint semioval: body cinereous, variegated with black.

Genus 27. LIMNORIA. *Leach.*

Head as broad as the first segment of the body: *eyes* granulated.

Sp. 1. *Lim. terebrans.* Body cinereous: eyes pitchy black.

Limnoria terebrans. *Leach, Edin. Encycl.* vii. 433 —*Trans. Linn. Soc.* xi. 370.—*Supp. to Encycl. Brit.* i. 428.

Inhabits the British ocean, perforating buildings of wood, piles, &c. It is common at the Bell-rock, and on the coasts of Suffolk and Yorkshire. It generally produces seven young ones.

Genus 28. CYMOTHOA. *Fabr., Dald., Leach.*

Head narrow and small: *eyes* obsolete: *body* with the first segment notched to receive the head.

Sp. 1. *Cym. Œstrum.*

Cymothoa Œstrum. *Fabr. Leach, Supp. to Encycl. Brit.* i. 428.

C. *Tail furnished with two setæ.*

Fam. VII. APSEUDIADÆ.

Genus 29. APSEUDES. *Leach.*

Body six-jointed: *tail* with six segments; the last largest, armed at the apex with appendices: *feet* fourteen; the *anterior pair* with a finger and thumb; the *second pair* compressed and dentated; the *third* and *fourth* alike and simple; the *fifth* with a double nail; the *sixth* and *seventh* spurious: the *superior antennæ* with a biarticulated peduncle armed at the apex with a jointed seta; the *inferior antennæ* bifurcate.

Sp. 1. *A. Talpa.* Rostrum acute, with three excavated longitudinal grooves.

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Cancer Gammarus. *Montagu, Trans. Linn. Soc.* ix. *t.* 4. *f.* 6. Apseudes Talpa. *Leach, Edin. Encycl.* vii. 404.—*Trans. Linn. Soc.* xi. 372.—*Supp. to Encycl. Brit.* 428. vol. i.

Inhabits the British ocean: length four lines: colour yellowish-white: is very rare.

D. *Tail furnished with styles.*

Fam. VIII. ASELLIDÆ.

Interior antennæ distinct.

STIRPS 1. *Styles* of the tail exserted: *anterior legs* monodactyle.

Genus 30. JANIRA. *Leach.*

Claws bifid: *eyes* moderate, lateral-subvertical: *internal antennæ* shorter than the peduncle of the external ones.

Sp. 1. *Jan. maculosa.* Body cinereous, maculated with fuscous.

Oniscus maculosus. *Montagu's MSS.* Janira maculosa. *Leach, Edin. Encycl.* vii. 434.—*Trans. Linn. Soc.* xi. 373.—*Supp. to Encycl. Brit.* i. 428.

Inhabits the southern coast of Devonshire, amongst marine plants.

Genus 31. ASELLUS. *Geoff., Olivier, Latr., Bosc, Leach.* ENTOMON. *Klein.*

Claws simple: *eyes* minute, lateral: *interior antennæ* of the length of the setiferous joint of the exterior ones.

Sp. 1. *Asel. aquaticus.* Colour cinereous, either spotted with gray or whitish.

Oniscus aquaticus. *Linn. Syst. Nat.* i. 1061. Aselle d'eau douce. *Geoff. Hist. des Insect.* xi. 672. *pl.* 22. *f.* 2. Squille Aselle. *De Geer, Mém. sur les Insect.* vii. 496. *pl.* 31. *fig.* 1. Aselle ordinaire. *Latr. Hist. Nat. des Crust. et des Insect.* vi. 359. Asellus vulgaris. *Bosc, Hist. Nat. des Crust.* ii. 170. *pl.* 15. *fig.* 7. *Latr. Gen. Crust. et Ins.* i. 63. *Leach, Edin. Encycl.* vii. 404. Idotea aquatica. *Fabr. Supp. Ent. Syst.* 303. Entomon hieroglyphicum. *Klein, Dub. fig.* 5. Asellus aquaticus. *Leach, Trans. Linn. Soc.* xi. 373.—*Supp. to Encycl. Brit.* i. 428.

Inhabits ponds and ditches, and is generally considered a sign of the purity of the water.

STIRPS 2. *Styles* of the tail not exserted. *Anterior legs* simple.

Genus 32. JÆRA. *Leach.*

Eyes moderately large, situated between the sides and the vertex of the head.

Sp. 1. *Jæ. albifrons.* Cinereous; front whitish.

Oniscus albifrons. *Montagu's MSS.* Jæra albifrons. *Leach, Edin. Encycl.* vii. 434.—*Trans. Linn. Soc.* xi. 373.—*Supp. to Encycl. Brit.* i. 428.

Inhabits marine plants, and beneath stones on the southern coast of Devon.

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Fam. IX. Ligiadæ. *Leach's MSS.*

Interior antennæ distinct. *Style* of the tail double, with double footstalks.

Genus 33. LIGIA. *Fabr., Latr., Bosc, Leach.*

External antennæ with the last joint composed of several other joints.

Sp. 1. *Lig. oceanica.* Antennæ as long as the body: back subscabrose.
Ligia oceanica. *Fabr. Supp. Ent. Syst.* 301. *Leach, Edin. Encycl.* vii. 406. —*Supp. to Encycl. Brit.* i. 428. Ligia Scopulorum. *Leach, Edin. Encycl.* vii. 406. Oniscus oceanicus. *Linn. Syst. Nat.* i. 1061.
Inhabits the rocky shores of the European ocean. The last joint of the antennæ varies much in the number of its segments, even in the two sides of the same individual.

Fam. X. Oniscidæ.

Antennæ two. *Styles* of the tail four, the lateral ones biarticulate.

* *Body not capable of contracting into a ball.*

a. *External antennæ eight-jointed.*

Genus 34. PHILOSCIA. *Latr., Leach.*

External antennæ with their bases naked: *tail* abruptly narrower than the body.

Sp. 1. *Phil. Muscorum.* Body variegated; sometimes pale brick-red.
Oniscus Muscorum. *Scop. Ent. Carn.* 1145. Oniscus sylvestris. *Fabr. Ent. Syst.* iv. 397. Philoscia Muscorum. *Latr. Gen. Crust. et Insect.* i. 69. *Leach, Edin. Encycl.* vii. 406.—*Supp. to Encycl. Brit.* i. 428.
Inhabits France, Germany, and England, under stones and mosses.

Genus 35. ONISCUS *of authors.*

Antennæ inserted beneath the anterior margin of the head, on a prominent part.

Sp. 1. *On. Asellus.* Above, obscure-cinereous, rough; the sides and a series of dorsal spots yellowish.
Oniscus Asellus. *Linné, Latr., Leach.* Oniscus murarius. *Fabr. Supp. Ent. Syst.* 300.
Inhabits rotten wood and old walls throughout the greater part of Europe.

It was formerly used in medicine, and was supposed to cure agues, consumptions, &c. but has now, like many other medicines, deservedly grown out of fashion, and is rejected from the modern Pharmacopœias. It is commonly called Pig's-louse, Wood-louse, Millepede or Carpenter.

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b. *External antennæ with seven joints.*

Genus 36. PORCELLIO. *Latr., Leach.*

External antennæ inserted on a prominence under the anterior margin of the head: *tail* with its lateral styles conic, prominulous.

Sp. 1. *Por. scaber.* Body rough.

Oniscus Asellus. *Fabr. Supp. Ent. Syst.* 300. Porcellio scaber. *Latr. Gen. Crust. et Insect.* i. 70 *Leach, Edin. Encycl.* vii. 406.—*Trans. Linn. Soc.* xi. 37.—*Supp. to Encycl. Brit.* i. 429.

Inhabits Europe. This species is found under stones, in rotten wood, and on old walls. It varies much in colour, being at one time blueish black, at another time yellow. In Scotland it is called Sclater.

** *Body contracted into a ball.*

Genus 37. ARMADILLO. *Latr., Leach.*

External antennæ seven-jointed, inserted on a prominence in a cavity on each side of the head: *tail* with the lateral styles not prominent.

Sp. 1. *Arm. vulgaris.* Griseous lead-coloured; hinder margins of the segments whitish.

Oniscus Armadillo. *Linn. Syst. Nat.* i. 1062. Armadillo vulgaris. *Latr. Gen. Crust. et Insect.* i. 70.—*Leach, Edin. Encycl.* vii. 406.—*Trans. Linn. Soc.* xi. 376.—*Supp. to Encycl. Brit.* i. 429.

Inhabits Europe amongst moss and under stones. It is commonly named the Pill-millepede, and paves the way to the *Myriapoda*: in general external appearance and in economy it is allied to the genus *Glomeris.*

Class II. *MYRIAPODA.*

This Class was proposed by Dr. Leach in the *Edinburgh Encyclopædia*, vol. vii. and has since been distinctly established, with its characters more decidedly shown, in a paper published in the eleventh volume of the *Transactions of the Linnean Society*, and also in the Supplement to *Encyclopædia Britannica*, vol. i.

By Linné the animals composing this group were denominated Scolopendræ and Juli, and were arranged with apterous insects. His pupil, J. C. Fabricius, in the Supplement to his *Entomologia Systematica*, placed them in a particular Class named Mitosata, comprehending all the species, like Linné, under the generic appellations of Julus and Scolopendra. Cuvier, in his *Tableau Elementaire*, arranged the *Myriapoda* with insects, in which he was followed by Dumeril, who has, however, adopted the new Genera proposed by Latreille.

They were arranged in the older works of Latreille along with Insects; but in his last work he has placed them in a peculiar Order of the Class Arachnoidea, which he had denominated Myriapoda; and has divided them into two Families.

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Lamarck arranged them with the Arachnoidea in three Genera; 1. SCOLOPENDRA; 2. SCUTIGERA; 3. JULUS; and in his last work he has adopted a fourth genus, POLLYXENUS.

Having given a slight sketch of what has been done by systematic writers, I shall proceed with the arrangement proposed by Dr. Leach, which differs from them merely in considering them as constituting a distinct Class, and in disposing the species under some additional generic heads, which a minute examination of their structure has most fully warranted.

CLASSIFICATION.—All the *Myriapoda* have their head distinct from the body, furnished with two antennæ. *Mandibles* two. *Maxillæ* four, confluent and forming a lower lip. All or most of the segments of the body furnished with two or four legs.

The nervous system is composed of a series of ganglia, one in each segment of the body; these ganglia are brought into communication with each other by two longitudinal bundles of nerves, or, as they are generally but improperly denominated, by a spinal marrow.

The CHILOGNATHA and SYNGNATHA, established as Families by Latreille, are adopted as Orders by Dr. Leach.

Order I. CHILOGNATHA.—*Antennæ* seven-jointed. *Legs* short. *Body* generally crustaceous.

Order II. SYNGNATHA.—*Antennæ* composed of fourteen or more joints. *Legs* elongated. *Body* depressed, coriaceous or membranaceous.

Order I. CHILOGNATHA.

Fam. I. GLOMERIDÆ. *Leach.*

Body contractile into a globe. *Eyes* distinct.

Genus I. GLOMERIS. *Latr., Dumér., Leach.* ARMADILLO. *Cuv.* *Antennæ* with the two first joints shortest, the sixth largest including the last, which is very small: *body* elongate-ovate, convex above, arched beneath; first segment a little semicircular lamina; the second larger than the others; the last semicircular and arched: *legs* sixteen pairs.

Sp. 1. *Glo. marginata.* Black; the margins of the segments luteous or orange.

Oniscus marginatus. *Villers, Entom.* iv. 187. *t.* 11. *f.* 15. Gloméris bordé. *Latr. Hist. Nat. des Crust. et des Insect.* vii. 66. Oniscus marginatus. *Oliv. Encycl. Méth. Hist. Nat.* vi. p. 24. Julus oniscoides. *Townson's Tracts,* p. 151. *Stewart's Elem. Nat. Hist.* ii. 307. Glomeris marginata. *Latr. Gen. Crust. et Insect.* i. 74. *Leach, Edin. Encycl.* vii. 407.—*Trans. Linn. Soc.* xi.—*Supp. to Encycl. Brit.* i. 430. *pl.* 22.—*Zool. Misc.* iii. *tab.* 132.

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Inhabits Britain, France, and Germany, under stones; but has generally been considered by British naturalists as a variety of *Armadillo vulgaris*.

Fam. II. JULIDÆ. *Leach.*

Body not contractile into a globe: *eyes* distinct.

Genus 2. JULUS *of authors.*

Body serpentiform, cylindric: *antennæ* with the second joint longer than the third: *legs* a great many.

The British species of this obscure genus may be found described in vol. xi. of the *Transactions of the Linnean Society*. The following species, which is the most common, will best serve as an example of the genus.

Sp. 1. *Jul. sabulosus*. Black-cinereous, with two red dorsal lines; last joint mucronated: legs luteous.

Julus sabulosus *of authors.*

Inhabits Europe, lurking beneath stones, especially in sandy places.

Genus 3. CRASPEDOSOMA. *Leach.*

Body linear, depressed; the sides of the segments laterally prominent: *antennæ* towards their extremities somewhat thicker, the second joint shorter than the third.

This genus was discovered by the late R. Rawlins, esq. one of the most promising naturalists of this country.

* *Middle of the segments prominent.*

Sp. 1. *Cras. Raulinsii*. Back fuscous-brown, with four lines of white spots: belly and legs reddish.

Craspedosoma Raulinsii. *Leach, Edin. Encycl.* vii. 407-434.—*Trans. Linn. Soc.* xi. 380.—*Supp. to Encycl. Brit.* i. 430. *pl.* 22.—*Zool. Misc.* iii. *tab.* 134. *fig.* 1-5.

Inhabits the neighbourhood of Edinburgh, where it occurs in some plenty under stones and amongst moss. It was first noticed by Mr. Rawlins.

** *Hinder angles of the segments produced.*

Sp. 2. *Cras. polydesmoides*. Body reddish gray: belly pale: legs reddish, with their bases pale; produced angles of the body each furnished with a seta.

Julus polydesmoides. *Montagu's MSS.* Craspedosoma polydesmoides. *Leach, Edin. Encycl.* vii. 407-434.—*Trans. Linn. Soc.* xi. 380.—*Supp. to Encycl. Brit.* i. 430. *pl.* 22.—*Zool. Misc.* iii. *tab.* 134. *fig.* 6-9.

Inhabits Devonshire, under stones. It is common all along the borders of Dartmoor, and on the southern coast. It was once taken by Dr. Leach in the garden of the British Museum.

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Fam. III. Polydesmidæ. *Leach.*

Eyes obsolete.

Genus 4. POLYDESMUS. *Latr., Dumér., Leach.*

Antennæ with the second joint scarcely longer than the first, and much shorter than the third: *body* linear; the segments laterally compressed, margined: *eyes* obsolete.

Sp. 1. *Pol. complanatus.* Reddish cinereous; last segment of the body mucronated.

Julus complanatus. *Linn. Syst. Nat.* i. 1065. *Fabr. Ent. Syst.* ii. 393. Polydesmus complanatus. *Latr. Gen. Crust. et Insect.* i. 76. *Leach, Edin. Encycl.* vii. 408.—*Trans. Linn. Soc.* xi. 381.—*Suppl. to Encycl. Brit.* i. 430. *pl.* 22.—*Zool. Misc.* iii. *tab.* 135.

Inhabits Europe, beneath stones.

Genus 5. POLLYXENUS. *Latr., Leach.*

Body elongated, linear, and depressed; the segments on each side with small bundles of scales, ending in pencils: feet twelve on each side: *antennæ* inserted beneath the head at the interior margin.

Sp. 1. *Pol. Lagurus.* Body brown: head black: the pencils of the tail white.

Scolopendra Lagura. *Linn., Fabr.* Pollyxenus Lagurus. *Latr. Gen. Crust. et Insect.* i. 77. *Leach, Zool. Misc.* iii. p. 38. *pl.* 135, B. *Cuv. Reg. An.* 3. 155.

Length of the body from 1½ to 2½ lines.

Inhabits Europe. In Britain it is found in profusion beneath the bark of trees.

Order II. SYNGNATHA.

Fam. I. Scolopendradæ. *Leach.*

Body with each segment bearing two legs; *hinder legs* distinctly longer than the others.

Stirps 1.—*Legs* on each side fifteen.

Genus 6. LITHOBIUS. *Leach, Lamarck.*

Antennæ conic-setaceous; joints (about forty-five) conic-setaceous, the two first joints largest: *under lip* anteriorly broadly notched; the margin very much denticulated: *eyes* granulated.

Sp. 1. *Lith. forficatus.* Head broad: under lip entirely and deeply covered with impressed dots: legs testaceous-yellowish.

Scolopendra forficata. *Linn. Syst. Nat.* i. 1062. *Fabr. Ent. Syst.* ii. 390. Lithobius forficatus. *Leach, Edin. Encycl.* vii. 408.—*Trans. Linn. Soc.* xi. 381.—*Supp. to Encycl. Brit.* i. 431. *pl.* 22.—*Zool. Misc.* iii. *tab.* 137.

Inhabits Europe, beneath stones.

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The other species are described in the eleventh volume of the *Transactions of the Linnean Society.*

STIRPS 2.—*Legs* on each side twenty-one.

Genus 7. CRYPTOPS. *Leach.*

Antennæ conic-setaceous, composed of (seventeen) globose-subconic joints: *under lip* not denticulated; anterior margin scarcely emarginate: *hinder legs* with the first joint toothless: *eyes* obscure.

Sp. 1. *Cryp. hortensis.* Testaceous-ferruginous: back deeper in colour: antennæ and legs hairy.

Scolopendra hortensis. *Donovan's Brit. Ins.* Cryptops hortensis. *Leach, Edin. Encycl.* vii. 408.—*Trans. Linn. Soc.* xi.—*Supp. to Encycl. Brit.* i. 431. *pl.* 22.—*Zool. Misc.* iii. *tab.* 139.

Inhabits gardens in and near Exeter. It has likewise been found near Plymouth in Devonshire.

Fam. II. GEOPHILIDÆ. *Leach.*

Body with each segment bearing two legs: *hinder legs* not distinctly longer than the others: *legs* many, varying in number in the same species.

Genus 8. GEOPHILUS. *Leach.*

Eyes obscure: (*lip* divided by a fissure?) *mandibles* strong: *antennæ* cylindric in some, towards the apex gradually somewhat narrower in others; composed of (fourteen) subcylindric joints a little narrower at their base.

* *Antennæ with short joints.*

Sp. 1. *Geoph. carpophagus.* Head, antennæ, and arms fulvescent: body violet, anteriorly yellowish: legs pale yellowish. Var. β. Body obscurely subviolet-testaceous, anteriorly subtestaceous.

Geophilus carpophagus. *Leach, Trans. Linn. Soc.* xi. 384.—*Supp. to Encycl. Brit.* i. 431.—*Zool. Misc.* iii. p. 43.

Inhabits Devonshire, in garden fruit: it is not uncommon.

Sp. 2. *Geoph. subterraneus.* Body yellow: head subferruginous.

Scolopendra subterranea. *Shaw, Trans. Linn. Soc.* ii. 7. Geophilus subterraneus. *Leach, Trans. Linn. Soc.* xi. 385.—*Zool. Misc.* iii. p. 44.

Inhabits the earth. It is very common in England.

Sp. 3. *Geoph. acuminatus.* Body ferruginous, anteriorly gradually narrower; head anteriorly, and the legs paler.

Geophilus acuminatus. *Leach, Trans. Linn. Soc.* xi. 386.—*Zool. Misc.* iii. p. 45.

Inhabits moss and beneath the ground. It is rare.

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** *Antennæ with elongate joints.*

Sp. 4. *Geoph. longicornis.* Body yellow: head ferruginous: antennæ long.
Geophilus longicornis. *Leach, Trans. Linn. Soc.* xi. 386.—*Supp. to Encycl. Brit.* i. 481. *pl.* 22.—*Zool. Misc.* iii. *tab.* 140. *f.* 3-6.
Inhabits the earth and under stones.

Obs.—*Scolopendra electrica* of Linné belongs to this genus.

Class III. *ARACHNOÏDA.*

Arachnoida. *Fischer.*

Arachnides. *Lamarck, Latreille, Leach.*

From αραχνη, a *spider*, and ειδος, *resemblance*. A class of animals formerly arranged with Insects, but first shown to be distinct by the celebrated Lamarck, and established as such by Latreille, Cuvier, and Leach.

Linné arranged all of these animals with which he was acquainted with apterous insects, under the generic titles, Phalangium, Aranea, Acarus, and Scorpio; and in this disposition he was followed by Cuvier.

Lamarck, in his *Système des Animaux sans Vertèbres*, has included amongst the *Arachnoida* the Myriapoda, and certain animals which in the system proposed by Dr. Leach form a distinct order of insects, which will be mentioned hereafter.

Duméril, in his *Zoologie Analytique*, has placed the *Arachnoida* with the apterous insects. He arranges the genus: 1. Ixodes *Latr.* with Pediculus and Pulex; the other genera he has placed in a peculiar family: 2. Aranea; 3. Mygale; 4. Phrynus; 5. Scorpio; 6. Chelifer; 7. Galeodes; 8. Phalangium.

Lamarck, in his *Extrait du Cours, &c.* has placed the *Arachnoida* with some genuine insects and *Myriapoda*; but he has formed for them a separate Order, which he terms *Arachnides palpati*, and disposes them into the following little groups of Genera.

I. PYCNOGONIDES.

Genus 1. Nymphum: 2. Phoxichilus: 3. Pycnogonum.

II. ACARIDES.

* *Parasitic.*

a. *Six legs.*

Genus 4. Astoma: 5. Leptus: 6. Caris.

b. *Eight legs.*

Genus 7. Uropoda: 8. Argas: 9. Ixodes: 10. Acarus.

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** *Wanderers.*

a. *Land.*

Genus 11. ORIBATA: 12. SMARIS: 13. CHEYLETUS: 14. BDELLA: 15. ERYTHRÆUS: 16. TROMBIDIUM.

b. *Aquatic.*

Genus 17. ELAIS: 18. LIMNOCHARIS: 19. HYDRACHNA.

III. PHALANGIDES.

Genus 20. SIRO: 21. TROGULUS: 22. PHALANGIUM: 23. GALEODES.

IV. SCORPIONIDES.

Genus 24. CHELIFER: 25. SCORPIO: 26. THELEPHONUS: 27. PHRYNUS.

V. ARANEIDES.

Genus 28. ARANEA: 29. MYGALE.

CLASSIFICATION.—The following Classification is that lately published in the third volume of the *Zoological Miscellany*.

Order I. POLYMEROSOMATA.—*Body* composed of a series of segments: *abdomen* not pedunculated: *mouth* furnished with didactyle mandibles and with maxillæ: *eyes* two, four, six, or eight: *legs* eight.

Order II. DIMEROSOMATA.—*Body* composed of two segments; the abdomen pedunculated: *mouth* furnished with mandibles and with maxillæ: *eyes* six or eight.

Order I. POLYMEROSOMATA. *Leach.*

Fam. I. SIRONIDÆ. *Leach.*

Palpi simple. *Mandibles* didactyle.

Genus 1. SIRO. *Latreille, Leach.*

Mandibles two; two-jointed, cylindric, compressed; their points armed with a forceps: *palpi* two, five-jointed; joints elongate, the second longest: *body* oval: *eyes* two, placed one on each side of the thorax on an erect peduncle: *legs* elongate, filiform; *tibiæ* and *tarsi* two-jointed, the latter parts terminated by an arcuate claw.

Sp. 1. *Siro rubens.* Pale red: legs paler.

Siro rubens. *Latr. Gen. Crust. et Insect.* i. 143. *Leach, Edin. Encycl.* vii. 416.—*Trans. Linn. Soc.* xi. 390.—*Supp. to Encycl. Brit.* i. 433. *pl.* 23.

Inhabits moss at the roots of trees and in woods.

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Fam. II. Scorpionidæ. *Leach.*

Palpi arm-shaped. *Mandibles* didactyle. *Legs* alike.

The animals composing this Family constitute a most natural groupe.

Stirps 1.—*Tail* none. *Eyes* two, or four. *Pecten* none.

"The ocelli of the animals of this division are placed on the sides of the anterior segment of the body or thorax. They want the tail and the pectinated processes near the base of the abdomen, by which they may very easily be distinguished from those of the second Stirps, with which they were formerly arranged by Fabricius under the title *Scorpio*. Two species only were known to Linné, who referred them to his artificial genus *Phalangium*. The greater number of the species live beneath the bark of decaying trees or under stones; but one at least is parasitical, and attaches itself to the legs of flies." *Leach's Zool. Misc.* vol. iii. Those genera of the second Stirps include the Scorpion, &c.

Genus 2. OBISIUM. *Illiger, Leach.*

Body cylindric: *thorax* composed of one segment: *mandibles* porrect *eyes* four.

Sp. 1. *Obi. trombidioides.* Second joint of the arms elongate: fingers long and straight.

Inhabits France and England, under stones.

A valuable Monograph has been published on the British species of this and the following genus in the third volume of the *Zoological Miscellany*, and is illustrated with very accurate figures of the whole.

Genus 3. CHELIFER. *Geoff., Leach.*

Thorax composed of three parts: *mandibles* short: *eyes* two.

Sp. 1. *Ch. fasciatus.* Hands oval; segments of the abdomen bordered with whitish.

Chelifer fasciatus. *Leach, Trans. Linn. Soc.* ix.

Inhabits beneath the bark of willow and other trees.

Obs.—Of the second stirps there are no British genera.

Order II. DIMEROSOMATA. *Leach.*

Fam. I. Phalangidæ. *Leach.*

Eyes two: *anus* simple.

Genus 4. PHALANGIUM *of authors.*

Eyes placed in a common peduncle: *mandibles* corneous, subcylindric, compressed, biarticulate, inflexed or geniculated at the second joint,

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the apex of which bears a forceps with equal fingers: *palpi* formed like legs, terminated by a hook: *body* more or less oval. *Second pair of legs* almost six times the length of the body: *tarsi* all capillary, very slender, the first joints elongate, four times (or more) longer than broad.

Sp. 1. *Ph. Opilio. Latr.*—Male, Phalangium cornutum. *Linn., Fabr.* Female, Phalangium Opilio. *Linn., Fabr.*

Inhabits Europe on walls and rocks.

Genus 5. OPILIO. *Leach.*

Eyes placed on a common peduncle: *mandibles* corneous, subcylindric, compressed, biarticulate, inflexed or geniculated at the second joint, the apex of which has a forceps with equal fingers: *palpi* formed like legs, terminated by a hook: *body* more or less oval. *Second pair of legs* three or four times the length of the body, the fourth and following joints a little elongate, twice as long as broad.

Sp. 1. *Op. Histrix.*

Inhabits France and England.

Fam. II. ARANEADÆ. *Leach.*

ARANEIDES. *Latreille.*

Eyes six or eight: *anus* with nipples for spinning.

The animals composing this most natural family are familiarly denominated Spiders, and, as before observed, were included by Linné, Fabricius, and other authors in one genus, which they called *Aranea*; but as the species are very numerous, they were obliged to divide them into sections, which they distinguished by the situations of their eyes. These organs are immoveable, and consist each of a single lens, which deprives them of the faculty of seeing in every direction.

"The ARANEADÆ are by far the most interesting animals of that class of which they form the type; and consequently their habits and structure excited the attention of naturalists at a very early period. Spiders frequently change their skins, and their skins are often found in their webs, being dry and transparent, with their mandibles attached to them. When about to cast their covering, they suspend themselves in some corner, and creep out of a fissure which takes place on their back, gradually withdrawing their legs from the skin, as if from a glove. They have likewise the power of reproducing their legs: the mode in which this takes place was first made known by that accurate observer of nature, Sir Joseph Banks."

"As he was writing one evening in his study, one of the web-spinning spiders, of more than the middle size, passed over some papers on the table, holding a fly in its mouth. Much surprised to see a spider of this description walking about with its prey, and

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being struck with somewhat unusual in its gait, he caught it, and placed it within a glass for examination, when, instead of eight, he perceived it had but three legs, which accounted for the inability of the creature to spin its web; but the curious circumstance of its having changed its usual economy, and having become a hunting instead of a spinning spider, as well as a wish to learn whether its legs would be renewed, induced him to keep the animal in the glass, from whence it could not escape, and to observe its conduct.

"On the following morning the animal ate two flies given to it, by sucking out the juices, but left the carcases entire. Two or three days afterwards it devoured the body and head of a fly, leaving only the wings and legs. After this time it sometimes sucked and sometimes ate the fly given to it. At first it consumed two flies in a day, but afterwards not more than one in two days. Its excrement, which it voided, was at first of a milky-white colour, but afterwards the white had a black spot in the centre, of a more solid appearance than the surrounding fluid.

"Soon after its confinement it attempted to form a web on the side of the vessel, but performed the business very slowly and clumsily, from the want of the proper number of legs. In about a fortnight it had completed a small web, upon which it generally sat.

"A month after having been caught, it shed its skin, leaving the slough on the web. After this change five new legs appeared, not half as long as the other three legs, and of very little use to the animal in walking. These new members, however, extended themselves a little in three days, and became half as long as the old ones. The web was now increased, and the animal continued immoveably sitting on it in the day time, unless drawn from it, or attracted by a fly thrown to it as its usual provision.

"Twenty-nine days afterwards it again lost its skin, leaving the slough hanging in the web, opposite to a hollow cell it had woven, so as to prevent it from being completely seen when lodged in it. The legs were now larger than before the change of skin, and they grew somewhat longer still in three or four days, but did not attain the size of the old legs.

"The animal now increased its web, and being put into a small bowl as a more commodious residence, soon renewed a better web than the first. In this state it was left on the first of November. No further observations have yet been made on the subject."

"The principal use of the *Araneadæ*, in the economy of nature, seems to be that of preventing the too great increase of insects."

SUBS 1.—*Legs* simple, *hinder eyes* not placed on the anterior and superior part of the thorax, nor forming an irregular hexagon. *The two exterior nipples* of the anus longer than the others, and project-

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ing. *Lip* not advancing between the maxillæ nor prominent, but as long as broad.

* *Eyes eight. Mandibles projecting.*

Genus 6. ATYPUS. *Latr., Leach.* OLETERA. *Walckenäer.*

Eyes on each side geminated: *lip* very small and quadrate, inserted under the base of the maxillæ: *palpi* inserted at the external base of the maxillæ, which are dilated at that part.

Sp. 1. *Aty. Sulzeri.* Black and shining: mandibles very long and strong: thorax nearly quadrate; plain behind, abruptly elevated before: the two middle eyes placed on an eminence: back of the abdomen coriaceous and more shining: joints of the legs shining.

Oletère difforme. *Walck. Tab. des Aran.* 7. Atypus Sulzer. *Latr., Leach.*

Inhabits France and England. In the latter country it was discovered by Dr. Leach near Exeter, and it has twice occurred near London.

** *Mandibles perpendicular. Eyes six.*

Genus 7. SEGESTRIA. *Latreille, Walckenäer, Leach.*

Maxillæ straight, longitudinal, with the base thickened, dilated externally, somewhat wedge-shaped, the middle longitudinally convex: *Lip* elongate-quadrate, longer than broad, the middle longitudinally convex or subcarinated: *legs*, the first pair longest, rest in proportion, the second, then the fourth, the third pair being shortest: *eyes* placed in a transverse line, the extremities somewhat recurved.

Sp. 1. *Seg. senoculata.* Thorax blackish-brown: abdomen oblong, griseous, with a longitudinal band of blackish spots: legs pale brown with obscure bands.

Aranea senoculata. *Fabr.* Segestria senoculata. *Walck., Latr., Leach.*

Inhabits rocks and old buildings. It is common in France, near Paris, and in England it is not rare.

Genus 8. DYSDERA. *Latreille, Walckenäer, Leach.*

Maxillæ straight, longitudinal, with the base thickened and externally dilated at the insertion of the palpi: the apex internally obliquely truncated, and thence externally acutely terminated: *palpi* with the first joint short and nearly obsolete: *lip* elongate, quadrate, gradually narrowing towards its point: *eyes* forming the figure of a horseshoe, the open part in front: *legs* with the first, then the fourth, then the second pair longest, the third shortest: *claws* with a little brush beneath.

Sp. 1. *Dys. erythrina.* Mandibles and thorax sanguineous: legs lightly coloured: abdomen soft, grayish yellow and silky.

Aranea erythrina. *Fourcroy Fn. Paris.* ii. 224. Dysdera erythrina. *Latr., Walck., Leach.*

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Inhabits the south of France, and England, beneath stones. It is rare in this country, but has been taken in Devonshire, near Plymouth and Exeter, and near London.

**** Mandibles perpendicular. Eyes eight.*

Genus 9. DRASSUS. *Walck., Latr., Leach.* GNAPHOSA. *Latr.*

Palpi inserted under the lateral and external margin of the maxillæ towards their middle: *maxillæ* longitudinal, arcuated, gradually becoming broader from the base towards the middle, somewhat concave internally, smooth externally, their middle impressed, the points bent inwards above the lip, and obliquely truncated within: *lip* elongate, ovate-quadrate, or rather oval; the base transversely truncated, inclosing the maxilla: *legs* with the first, and afterwards the second pair longest.

** Lip somewhat oval; the external side of the maxillæ much bent and arched.*

Sp. 1. *Dras. melanogaster.* Mandibles blackish: thorax and legs obscure brown: thighs light reddish-brown: abdomen cinereous-brown and silky.

Drassus melanogaster. *Latr., Leach.* Drassus lucifuge. *Walck.*

Inhabits France and England, under stones.

*** Lip ovate quadrate.*

Sp. 2. *Dras. ater.* Entirely black.

Drassus ater. *Latr., Leach.*

Inhabits the vicinity of Paris, and near London, under stones.

Genus 10. CLUBIONA. *Latr., Walck., Leach.*

Maxillæ straight and longitudinal: the basis a little dilated externally: the apex rounded and obliquely truncated on the inside: *lip* elongate, quadrate, gradually narrowing towards the point: *legs*, the first or the fourth pair longer than the second pair.

** The two outermost eyes on either side neither placed very close together, nor inserted on a distinct prominence. (The maxillæ in all with an incrassated base; the fourth pair of feet (rarely the first) longest.)*

Sp. 1. *Clu. lapidicola.* Thorax and mandibles pale reddish: feet very light red: abdomen ash-grey coloured.

Inhabits France and England under stones, constructing a globular cell of the size of a common hazel nut, in the centre of which are deposited a vast number of pale yellowish eggs agglutinated into a spherical mass.

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The mandibles of the male are porrect, and rather more than half the length of the thorax; those of the female rather vertical.

** *The two external eyes on each side placed rather close to each other. (Maxillæ not always thickened at their base; the first and then the second pair of legs longest.)*

A. *Maxillæ somewhat thickened at their base, and transversely impressed before the middle.*

Sp. 2. *Clu. Nutrix.* Ungulæ black: thorax and mandibles light red: legs very light red: abdomen yellowish green, with an obscure longitudinal band.

It has once occurred in England, near Cheltenham.

B. *Maxillæ not thickened at their base; front not transversely impressed.*

Sp. 3. *Clu. atrox.* Brown: legs pale: tibiæ with dark spots: middle of the back of the abdomen with a somewhat quadrate black spot, margined with yellow.

Inhabits old walls and the fissures of rocks. It is very common in Britain and France.

Genus 11. ARANEA *of authors.* TEGENERIA. *Walck.*

Maxillæ straight and longitudinal, with their internal angle distinctly truncate, diameter equal, apex rounded: *lip* elongate, nearly quadrate, longer than broad, towards the superior angles a little narrower: *legs*, the anterior pair about the same length with the fourth pair; third pair shortest: *eyes* disposed in two transverse lines near each other, and bent backwards.

Sp. 1. *Ar. domestica.* Livid-cinereous; thorax of the *male* immaculate; of the *female*, on each side with a longitudinal blackish band: abdomen blackish, middle of its back with a longitudinal, maculose, dentated band, and the lateral lineolæ livid.

Aranea domestica. *Linn., Fabr., Latr., Leach.* Tegeneria domestica. *Walck.*

Inhabits houses in Europe; spinning its web in a place where there is a cavity, such as the corner of a room. The mode of constructing the web is curious. Having chosen a convenient situation, she fixes one end of the thread to the wall, and passes on to the other side, dragging the thread along with her, till she arrive at the other side, where she fixes the other end of it. Thus she passes and repasses until she has made as many parallel threads as are necessary; she then crosses these by other threads. This net is intended for the capture of her prey; and, in addition to it, the animal prepares a cell for herself, where she remains concealed, and on the watch. Between the cell and the net the spider builds a bridge of threads, which,

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by communicating with the threads of the large net, both gives her intelligence when any thing touches the web, and enables her to pass quickly in order to seize it.

Genus 12. AGELENA. *Walckenäer, Leach.*

Maxillæ straight and longitudinal, their internal angle slightly truncate; diameters equal, apex rounded: *lip* not longer than broad, towards the superior angle a little narrower: *legs* moderately long, the anterior and fourth pairs of nearly equal length, the third pair shortest: *eyes* disposed in two transverse lines near to each other, and bent backwards.

Sp. 1. *Ag. labyrinthica.* Griseous pale-reddish: thorax on each side with a blackish longitudinal line: abdomen black, above and on each side with white oblique lines forming obtuse angles, running together anteriorly in pairs; the weaving appendices or nipples conic, elongate.

Inhabits the fields. It is very common in most parts of Europe during the summer months. In Britain it is most abundant in the autumn. It spins a horizontal web on the ground, in which it watches for its prey, consisting of flies and other dipterous insects. The spider itself lives in a funnel-shaped cavity, often extending below the surface of the ground.

Genus 13. ARGYRONETA. *Latreille, Walckenäer, Leach.*

Maxillæ short, straight, elongate quadrate, the sides of nearly equal diameters; anteriorly convex; the apex rounded: *lip* short, shorter than the maxillæ; of a narrow elongate-triangular form; the anterior aspect convex; the apex obtuse or truncate: *legs*, the first, the fourth pair longest; the second pair shortest: *eyes* with the four middle ones forming a quadrangle, the two on each side set obliquely and subgeminated.

Sp. 1. *Arg. aquatica.* Blackish-brown: abdomen black velvety, with some impressed dots on its back.

Aranea aquatica. *Linn., Fabr.* Argyroneta aquatica. *Latr., Walck., Leach.*

Inhabits Europe, frequenting slow running waters and ditches, spinning a web most beautifully constructed under the water, in which it lives, being surrounded with air, which shines through the water with a silvery lustre. The eggs are deposited in a globose silky bag. It is extremely common in most of the ditches round London, and may be observed, especially in the beginning of the summer, building its nest beneath the water, or running along the lines by which it is suspended.

STIRPS 2.—*Legs* simple: *hinder eyes* not placed on the anterior and superior of the thorax, nor forming an irregular hexagon: *nipples*

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of the anus short and nearly equal, of a conic form: *lip* nearly semicircular, broader than long, and projecting between the maxillæ: (*eyes* eight.)

* *Eyes not describing the segment of a circle. Maxillæ straightened towards their extremities, but not dilated.*

Genus 14. SYCTODES. *Latreille, Walckenäer, Leach.*

Maxillæ oblique and longitudinal, covering the sides of the lip; their bases thickened, the apex internally obliquely truncated: *lip* somewhat quadrate, the base a little contracted: *legs* with the fourth, then the first pair longest; the third pair shortest.

Sp. 1. *Syc. thoracica.* Pale reddish-white, spotted with black: thorax large and somewhat orbicular, elevated roundly behind: abdomen lighter in colour, and subglobose.

Inhabits Paris, in houses. It has twice occurred near Dover, but both the individuals were females.

Genus 15. THERIDIUM. *Walckenäer, Latreille, Leach.*

Maxillæ with an oblique direction covering the sides of the lip, converging towards their points; of equal breadth; the internal apex obtuse, or obliquely truncated: *lip* small, triangular, or semicircular; the apex truncate or subrounded: *legs* elongate, the first, then the fourth pair longest: *eyes* with four in the centre, forming a quadrangle, the under ones placed on a common elevation; two others on each side geminated, and situated on a common elevation.

Sp. 1. *Th. sisiphum.* Rufous: abdomen globose, with three lines.

Theridium sisiphum. *Leach.*

Inhabits Europe, in the corners of buildings, walls, and rocks. *It is figured by Lister, t.* 14. *fig.* 14.

Genus 16. PHOLCUS. *Walckenäer, Latreille, Leach.*

Maxillæ oblique, covering the sides of the lip, converging from the base to the apex: *apex* internally truncated: *lip* transversely quadrate; the lateral angles of the apex rounded and somewhat margined: *legs* very long and very slender; the first, then the second and fourth (nearly equal) the longest: *eyes* inserted on a tubercle; two geminated and placed transversely in the middle; three on each side amassed in a triangle, one larger than the rest.

Sp. 1. *Ph. phalangiöides.* Pale-livid: abdomen elongate, cylindric-oval, very soft, obscure cinereous: tip of the tibiæ and thighs with a pale ring of a whitish colour.

Pholcus phalangiöides. *Walck., Latr., Leach.* Aranea Pluchii. *Scopol.* Aranea opilionides. *Schrank.* Aranea phalangioides. *Fourcroy.*

Inhabits houses in Europe; in the western parts of England it is extremely common. Its body vibrates like that of a tipulideous insect.

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** *Eyes not describing the segment of a circle. Maxillæ straight, with their points dilated.*

Genus 17. TETRAGNATHA. *Latreille, Leach.*

Eyes subequal; disposed in two straight and almost parallel transverse lines, the four middle ones forming nearly a regular quadrangle: *maxillæ* straight, elongate and narrow, almost equally broad; the apex externally dilated and round: *lip* semicircular and somewhat notched: *legs* very long and very slender; the first pair longest, then the second, afterwards the fourth.

Sp. 1. *Tet. extensa.* Reddish; abdomen oblong, golden green, with the sides and two lines below yellowish; the middle below longitudinally black.

Aranea extensa. *Linn., Fabr.* Tetragnatha extensa. *Latr., Walck., Leach.*

Inhabits Europe; frequenting moist places, in which it constructs a vertical web, sitting on it with its legs extended.

Genus 18. EPEÏRA. *Walckenäer, Latreille, Leach.*

Latreille has divided this genus into sections, most of which would form good genera.

Eyes with the four middle ones placed on an abruptly formed tubercle in the form of a quadrangle, the two anterior ones largest and most distant; the lateral eyes on each side subgeminated and placed obliquely on a tubercle: *maxillæ* subcircular, internally membranaceous: *lip* semicircular; short, with the point membranaceous: *legs* moderately long, hispid, the thighs rather strong; the first pair largest, then the second, afterwards the fourth pair: *thorax* inversely elongate subcordate, anteriorly broadly truncated: *abdomen* subglobose, large, much broader than the thorax.

Sp. 1. *Ep. Diadema.* Reddish; abdomen globose-oval, with an elevated angle on each side of its base; dorsal band broad, triangular, dentated, darker, with a triple cross of luteous white dots or spots, and with four impressed dots disposed in a quadrangle.

Aranea Diadema. *Linn.* Araignée à croix. *De Geer.* Epeïra Diadema. *Walck., Latr., Leach.*

Inhabits Europe. It frequents the borders of woods, rocks, and gardens, and is well known in Britain by the names Sceptre or Diadem Spider.

*** *Eyes describing the segment of a circle.*

Genus 19. THOMISUS. *Walck., Latr., Leach.* HETEROPODA. *Latr.* MISUMENA. *Latr.*

Eyes generally subequal, placed in two transverse lines in a kind of semicircle: *maxillæ* oblique, covering the side of the lip and in some degree converging; the internal apex truncate: *lip* somewhat oval

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or nearly quadrate, generally longer than broad: *legs*, the first and second pair longest: the second rather longest; the third and fourth pair of legs much less, sometimes one being largest, sometimes the other.

The *mandibles* of the animals composing this genus are either perpendicular or somewhat inflexed; in many conical with many short claws.

* *Thorax convex, cordiform; the sides, especially behind, abruptly sloping, anteriorly broadly truncate; the largest legs not double the length of the body; the first and second pair much thicker than the others, sometimes one sometimes the other being longest. The first joint of the tarsi, with several moveable little spines, in a single or in a double series; the claws of the tarsi naked. Lip somewhat oval, the apex truncate or obtuse. Apex of the maxillæ wedge-shaped.*

Sp. 1. *Tho. citreus.* Thorax at the insertion of the eyes transversely elevated; the sides anteriorly produced and prominent: eyes equal: abdomen roundish, trigonal, broader behind, with a red line on each side: body yellowish citron-coloured.

Inhabits Europe, living in flowers. It is very common in Britain. The male is rare, smaller than the female; of a brown colour banded with yellowish green.

** *Thorax convex, cordiform; the sides, especially behind, abruptly sloping, the anterior part broadly truncated; the larger legs not twice the length of the body, all of nearly an equal degree of thickness; the hinder four not much shorter; the anterior with four little spines: the claws of all the tarsi scarcely visible. Lips somewhat oval: the apex truncate or obtuse. Maxillæ at their points wedge-shaped.*

Sp. 2. *Tho. lynceus.* Lateral eyes largest, placed on an eminence, the tubercles of the hinder ones thickest: body pale yellowish-grey, variegated with punctures and spots of a blackish colour: abdomen very large, of a triangular-oval form, broader behind.

Inhabits France and Scotland. Latreille considers it to be much allied to *Thomisus onustus* of Walckenäer.

*** *Thorax depressed, somewhat oval, very obtuse before; the larger legs not twice the length of the body; all the legs of equal thickness: the tarsi hairy beneath, the first joint with a few little spines: the apex with two brushes under the claws: abdomen oblong: the maxillæ beyond the insertion of the palpi, nearly of equal breadth, distinctly and abruptly truncated: lip somewhat quadrate: hinder eyes distant.*

Sp. 3. *Tho. oblongus.* Pale-yellowish, with white hairs above: abdomen somewhat cylindrical, with obscure longitudinal lines.

Inhabits France, Denmark, and England, on plants.

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STIRPS 3.—*Legs* not formed for leaping. *Hinder eyes* placed on the anterior and superior part of the thorax, forming an irregular hexagon. (*Hinder pair of legs* longest.)

Genus 20. LYCOSA. *Latreille, Walckenäer, Leach.*

Maxillæ straight, anteriorly convex; externally towards the side somewhat arcuated; internally slightly margined, gradually narrowing towards the base; the apex obliquely truncated, forming almost an inverted triangle: *lip* elongate, quadrate: *legs* strong, the fourth pair longest, then the second; the third shortest.

Sp. 1. *Lyc. saccata.* Above smoky-black clouded with cinereous villosity; carina of the thorax obscure, reddish, with a cinereous villous line; base of the abdomen with a little bundle of griseous hairs: legs livid-red, with blackish spots.

Inhabits Europe. It is very common in Britain: the female may be observed in gardens carrying her bag of eggs, of a green colour: palpi, mandibles, and anterior margin of the thorax livid-red in the female, black in the male.

Genus 21. DOLOMEDES. *Latreille, Walckenäer, Leach.*

Maxillæ straight, oval-quadrate; the apex externally rounded, internally obliquely truncated: *lip* somewhat square, the diameters nearly equal, the points of the angles rounded: *legs* elongate; the fourth pair longest, then the second; the third shortest: *claws* exserted, without brushes below.

Sp. 1. *Dol. mirabilis.* Pale reddish, covered with greyish down: thorax heart-shaped, anteriorly abruptly sloping: the anterior angles and dorsal line whitish: abdomen conical, suboval: back darker.

Aranea saccata. *Linn.* Dolomedes mirabilis. *Walck., Latr., Leach.* Aranea Listeri. *Scopoli.* Aranea obscura. *Fabr.*

Inhabits woods.

STIRPS 4.—*Legs* formed for leaping: (*Eyes* eight. *Thorax* never carinated.)

Genus 22. SALTICUS. *Latr., Leach.* ATTUS. *Walck.*

Maxillæ straight, longitudinal, subrhomboidal, or inverse-cuneate-ovate: *lip* elongate, suboval, the apex obtuse: *palpi* clavate: *thorax* truncate-ovate or parallelogrammic: *eyes* disposed in the form of a horse-shoe, the two middle ones largest: *legs* thick and short; the first pair thickest and not longer than the fourth pair; the second and the third pairs of nearly an equal length, and shorter than the two other pairs.

Sp. 1. *Sal. scenicus.* Black; margin of the thorax covered with white down: abdomen short ovate; above with a reddish-gray pubescence, with three transverse arcuate lines, and the anus white; the first band basal and entire, the others acutely bent anteriorly, and interrupted in their middle.

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Aranea scenica. *Linn.*, *Fabr.* Atte paré. *Walck.* Salticus scenicus. *Latr.*, *Leach.*

Inhabits walls and palings. It is found in most parts of Europe, and is called in Britain the Hunting Spider.

Genus 23. ATTUS. *Walck.*, *Leach's Supp. to Encycl. Brit.* SALTICUS. *Latr.*, *Leach's Edin. Encycl.* vol. vii.

Maxillæ straight, longitudinal, subrhomboidal or inversely cuneate-ovate: *lip* elongate, suboval, with the apex obtuse: *palpi* filiform: *thorax* elongate, narrow, subconic: *eyes* disposed in the form of a horse-shoe; the two middle eyes largest: *legs* slender, elongate, the first pair thickest and not longer than the fourth pair; the second and third pairs of nearly an equal length and shorter than the other pairs.

Sp. 1. *Att. formicarius.* Thorax anteriorly black, behind red: abdomen fuscous, with a white spot on each side: legs red.

Attus formicarius. *Walck.* Salticus formicarius. *Latr.*, *Leach.* Araignée fourmi. *De Geer.*

Inhabits Europe, residing on plants and walls. It is very rare in Scotland, and has not been observed in England.

Class IV. *ACARI. Leach's MSS.*

In the *Supplement to Encycl. Brit.* vol. i. the animals of this Class were arranged with the Arachnoïda and formed the Order Monomerosomata. Since that paper was written, Dr. Leach has, from a further investigation of their characters, separated them from the Arachnöida (in which they differ essentially), and considers them as a distinct class; they are for the most part parasitic, living on the bodies of other animals: to the lovers of the microscope these animals will afford an extensive field for their research and investigation; they are very numerous, highly interesting, and as yet but imperfectly known.

CHARACTER.—*Body* formed but of one segment: *mouth* rostriform, or in some furnished with maxillæ and mandibles: *legs* six or eight: *tracheæ* for respiration.

Section I.—*Legs formed for walking.*

A. *Mouth with mandibles.*

Fam. I. TROMBIDIADÆ. *Leach.*

Palpi porrect, and furnished at their extremities with a moveable appendage. *Eyes* two, placed on a pillar. *Body* apparently divided into two parts by a transverse line; the anterior division bearing the eyes, mouth, and four anterior legs.

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Genus 1. TROMBIDIUM. *Fabr.*, *Latr.*, *Leach.*

Legs eight.

Sp. 1. *Trom. holosericeum.* Subquadrate, blood-red, tomentose; the down short composed of cylindric papillæ, which are rounded at their extremities.

Trombidium holosericeum. *Fabr.*, *Latr.*

Inhabits Europe, and is abundant in the spring.

Genus 2. OCYPETE. *Leach.*

Legs six.

Sp. 1. *Ocy. rubra.* Red; back with a few long hairs, the legs with many short hairs of a rufous ash-colour; eyes black brown.

Ocypete rubra. *Leach, Trans. Linn. Soc.* xi.

This curious little animal, which is not larger than a grain of small sand, is parasitic, and is frequently to be found on the largest tipuladous insects, adhering to their legs. No less than sixteen specimens have been obtained from one insect.

Fam. II. GAMMASIDÆ. *Leach.*

Palpi porrect, simple.

Genus 3. GAMMASUS. *Latreille*, *Leach.*

Body depressed, the skin of the back partly or entirely coriaceous.

* *Anterior portion of the back, and a triangular part behind, coriaceous.*

Sp. 1. *Gamm. Coleoptratorum.* Coriaceous parts of the back fuscous; anterior pair of legs a little longer than the hinder ones.

Gammase des Coléoptères. *Latr. Hist. Nat. des Crust. et des Insect.* vii. 399. Gammasus Coleoptratorum. *Latr. Gen. Crust. et Insect.* i. 147. *Leach.* Acarus Coleoptratorum. *Linn.*, *Fabr.*

Inhabits the excrements of horses and oxen, often attaching itself to *Scarabæi*, *Histeres*, &c. in great numbers.

** *Back entirely coriaceous.*

Sp. 2. *Gamm. marginatus.* Ovate, brown; belly coriaceous, the sides alone membranaceous and whitish; anterior legs nearly twice the length of the body.

Inhabits dung and dead animals.

Fam. III. ACARIDÆ. *Leach.*

Mouth furnished with mandibles: *palpi* simple, very short, not porrected.

Genus 4. ORIBITA. *Latreille*, *Leach.*

Body covered by a coriaceous skin; anterior part rostrated; the produced part inclosing the organs of mastication: *abdomen* subglobose: *tarsi* with claws.

Sp. 1. *Or. geniculata.* Fuscous-castaneous, shining, hairy: legs pale-fuscous: thighs subclavate.

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Acarus geniculatus. *Linn.*

Inhabits trees and beneath stones. It is common in Sweden, Germany, and England.

Genus 5. NOTASPIS. *Hermann.*

Body covered by a coriaceous skin, the anterior part rostrated, the produced part inclosing the organs of mastication: *abdomen* subglobose, the sides anteriorly with a wing-like process: *tarsi* with claws.

Sp. 1. *Not. humeralis.* Abdomen blackish-chesnut; the produced parts membranaceous.

Mitte à rebord. *De Geer.* Oribita humeralis. *Latr., Leach.*

Inhabits moss and beneath stones. It is not uncommon in the southern parts of Devonshire.

Genus 6. ACARUS *of authors.*

Body soft: *mouth* naked: *tarsi* with a pedunculated vesicle at their extremities.

Sp. 1. *Aca. domesticus.* White, with two brown spots; body ovate, the middle coarctate, with very long hairs: legs equal.

Acarus Siro. *Linn., Fabr., Leach Edin. Encycl.* vii. 415. Acarus domesticus. *Latr., Leach Supp. to Encycl. Brit.* i. 444.

Inhabits houses, living in cheese and flour that have been kept too long.

B. *Mouth furnished with a rostrum.*

Fam. IV. IXODIADÆ. *Leach.*

Eyes obscure or concealed.

STIRPS. 1.—*Palpi* and *rostrum* exserted.

Genus 7. IXODES. *Latreille, Leach.* CYNORHŒSTES. *Hermann.*

Palpi equally broad, longer than broad.

Sp. 1. *Ix. Ricinus.* Scutum rounded, smaller; with the vagina of the rostrum and the legs fuscous: abdomen varying in colour.

Acarus Ricinus. *Linn., Fabr.* Ixodes Ricinus. *Latr., Leach.*

Inhabits Europe, attaching itself to dogs. In Britain it is called the Dog-tick.

Dr. Leach has written a paper on the British species of this genus, which is published in the eleventh volume of the *Transactions of the Linnean Society.*

STIRPS 2.—*Palpi* and *rostrum* hidden.

Genus 8. UROPODA. *Latreille, Leach.*

Body oval, orbiculate: back corneous, clypeiform, the disc being gradually convex; beneath flat: *anus* produced into a long filiform peduncle (by which it adheres to coleopterous insects): *legs* very short, pressed close to the body, the first pair shortest, the second pair rather longer, the third distinctly longer, the fourth pair longest.

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Sp. 1. *Uro. vegetans.* Brown, very smooth, shining.
Mitte vegetative. *De Geer.*, vii. 123. *pl.* 7. *fig.* 15.
Uropoda vegetans. *Latr.*, *Leach.*
Inhabits France and England, attaching itself to the legs, abdomen, and elytra of *Histeres*, *Aphodii*, &c. by its pedunculated anus.

Fam. V. CHEYLETIDÆ. *Leach.*

Eyes distinct: *palpi* concealed.

STIRPS 1.—*Palpi* distinct.

Genus 9. SARCOPTES. *Latreille*, *Leach.*

Sp. 1. *Sar. Scabiei.* Subrotundate; legs short, reddish; four hinder ones, with a very long seta: the plantæ of the four anterior ones terminated by a swelling.
Mitte de la Gale. *De Geer.* Acarus Scabiei. *Fabr.* Le Ciron de la Gale. *Geoff.* Sarcopte de la Gale. *Latr. Hist. Nat. des Crust. et des Insect.* viii. 55. et vii. *pl.* 66. Sarcoptes Scabiei. *Latr.*, *Leach.*
Inhabits the ulcers of the itch. Acarus exulcerans of *Linné* is probably this animal, or is at least referable to the same genus.

Section II.—*Legs formed for swimming.*

Fam. HYDRACHNADÆ.

Mouth with mandibles.

Genus 10. HYDRACHNA. *Müll.*, *Oliv.*, *Latr.*, *Leach.*

Palpi subcylindric, porrect, arcuate inflexed, four-jointed, the last acute unguiform: *mouth* produced into a conic rostrum: *body* globose: *legs* fimbriated with hairs, and situated at equal distances from each other.

Sp. 1. *Hy. geographica.* Black, with coccineous spots and dots.
Hydrachna geographica. *Müll. Hydr.* 59. *tab.* 8. *fig.* 3-5. *Latr.*, *Leach.*
Inhabits waters that flow gently. It is a most beautiful animal, and is very common near London.

Genus 11. LIMNOCHARES. *Latr.*, *Leach.*

Palpi incurved, the apex acute simple: *mouth* with a very short rostrum: *body* depressed: *legs* short, the four hinder ones remote: *eyes* two.

Sp. 1. *Lim. holosericea.* Body ovate, red, rugose, soft; eyes black.
Acarus aquaticus. *Linn.* La Tique rouge satinée aquatique. *Geoff.* Mitte satinée aquatique. *De Geer.* Trombidium aquaticum. *Fabr.* Limnochares holosericea. *Latr.*, *Leach.*
Inhabits Europe. It is very common in most of our ponds during the summer months. It varies much in colour, but is generally found of a bright red or greyish-red colour, and of all the intermediate varieties of shape.

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Class V. *INSECTA.*

History.—Insecta, so named from *in* (into) and *seco* (to cut). This term was applied to these animals by the Latins; by the Greeks they were named Entoma (ἔντομα), from ἐν, *into*, and τέμνω, *to cut*. Insects were so named, because their bodies are composed of many joints or segments; on which account several of the ancient and older naturalists placed them with the classes *Crustacea*, *Myriapoda*, *Arachnoida*, and *Vermes*.

The oldest records on this subject are to be found in the sacred writings, where mention is made of locusts, flies, and caterpillars; and it is probable that Moses had acquired some knowledge of insects from the Egyptian sages, as his writings abound with passages relating to insects.

Hippocrates, as we are told by Pliny, wrote on insects; and the writings of the earlier Greek and Latin philosophers, quoted by Pliny, afford extracts of his labours.

Aristotle, in his *History of Animals*, has devoted a very considerable portion of his attention to insects, and has described their general external structure with great accuracy.

Aldrovandus, in 1602, published a very voluminous work, *De Animalibus Insectis*, in which he divides insects into *Terrestrial* and *Aquatic*.

In 1612, Wolfgang Frantzius published *Historia Animalium Sacra*, which contains some new observations, and a distribution of insects into *Aërial*, *Aquatic*, and *Terrestrial*.

Swammerdam, who published his *Historia Insectorum Generalis* in 1669, divided genuine insects into, 1st, Those which, after leaving the egg, appear under the form of the perfect insect, but have no wings, which parts are afterwards produced: 2dly, Those insects which appear, when hatched from the eggs, under the form of a larva, and, when full grown, change into a chrysalis, where it remains until its parts are fit to be developed: 3dly, Those which, having attained the pupa (chrysalis or nympha) state, do not divest themselves of their skin. His other divisions refer to animals of the classes *Arachnoïda*, *Crustacea*, and *Myriapoda*; and the whole of his work contains much valuable observation on the structure and economy of these animals.

In 1735, Linné published the first edition of his *Systema Naturæ, sive Regna tria Naturæ systematicè proposita per Classes, Ordines, Genera, et Species*, in which work Insects are distributed into four Orders, according to the number and form of their wings: 1. Coleoptera; 2. Angioptera; 3. Hemiptera; 4. Aptera.

With the last Order he included *Crustaçea*, *Arachnides*, *Myriapoda*, *Vermes*, and certain *Zoophytes*; but in subsequent editions of this work

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he separated the Vermes, as Aristotle had done before him, and established them as a class distinct from Insects.

Schæffer, in 1741, published a valuable work, under the title *Icones Insectorum circa Ratisbonam indigenorum.* The classification proposed by the author differs entirely from that of Linné, and approaches in some respects that proposed by Geoffroy.

In 1764, Geoffroy published his most valuable System of Insects, under the title *Histoire abrégée des Insectes, &c.* in which these animals are arranged into six sections.

In 1776, J. C. Fabricius, a pupil of Linné, published a new system of entomology, under the title *Systema Entomologiæ*, in which the principles of a new mode of classification, founded on the organs of deglutition and mastication, is for the first time developed. This system, which has undergone several modifications, is named the *Cibarian System.*

Scopoli, in 1777, published his *Introductio ad Historiam Naturalem*, in which work he divides insects into five tribes, under the singular appellations of, 1. *Swammerdami-Lucifuga* ; 2. *Geoffroy-Gymnoptera* ; 3. *Roeselii-Lepidoptera* ; 4. *Reaumurii-Proboscidea* ; 5. *Frischii-Coleoptera*, identifying each tribe by the name of each author, who has, in his opinion, been most successful in the explanation of that to which his name is attached.

The *Lucifuga* includes the lice; *Gymnoptera*, his *halterata*, *aculeata*, and *caudata*: *Lepidoptera*, the moths and butterflies: *Proboscidea* he has divided into terrestrial and aquatic; and the *Coleoptera* he divides into those inhabiting water, and those the land.

In 1780, Linné produced the twelfth edition of his *Systema Naturæ*, which was the last systematic work of that illustrious naturalist.

In 1793, P. A. Latreille published his *Précis des Caractères Génériques des Insectes*, in which he divided Insects into I. Aile's : 1. *Coleoptera*, 2. *Orthoptera*, 3. *Hemiptera*, 4. *Neuroptera*, 5. *Lepidoptera.* II. Aptæres : 6. *Suctoria*, 7. *Thasynoura.*

In 1798, J. C. Fabricius produced his last general systematic work, the *Supplementum Entomologiæ Systematicæ*, which presents an outline of his system in its latest state ; and which, being the result of much knowledge, demands a considerable portion of attention.

In the *Entomologie Helvetique*, a work published in 1798, Clairville, its author, has arranged Insects in the following manner :

* PTEROPHORA ; Mandibulata. With wings and jaws.

Section 1. Elytroptera. Wings crustaceous.
2. Deratoptera. Wings coriaceous.
3. Dictyoptera. Wings reticulated.
4. Phlebоptera. Wings veined.

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** PTEROPHORA; Haustellata. With wings and a haustellum.

Section 5. Halteriptera. Wings with poisers.
6. Lepidoptera. Wings with powder.
7. Hemimeroptera. Wings partly obscure, partly diaphanous.

*** APTERA; Haustellata. Without wings; with a sucker.

8. Rophoptera. Sucker sharp.

**** APTERA; Mandibulata. Without wings, with jaws.

9. Pododunera. Legs formed for running.

In 1800, Cuvier, with the assistance of Duméril, published his *Anatomie Comparée*, in which the organization of Insects is treated of at great length.

In 1801, J. B. Lamarck produced his *Systême des Animaux sans Vertèbres*, in which work he has arranged some of the genuine Insects with the *Arachnoïda*; the rest he distributes into the following Orders:

* *With mandibles and jaws.*

Order I. Coleoptera. II. Orthoptera. III. Neuroptera.

** *With mandibles, and with a kind of proboscis.*

Order IV. Hymenoptera.

*** *No mandibles. A trunk or sucker.*

Order V. Lepidoptera. VI. Hemiptera. VII. Diptera. VIII. Aptera.

In 1806, Latreille published his *Genera Crustaceorum et Insectorum*, in which he has denominated the true Insects *Insecta Pterodicera*; and has arranged them in the following manner:

Century I. ELYTHROPTERA.

Elytra two, covering the wings entirely.

Cohors I. Odontota.

Mouth with mandibles, maxillæ, and lip. Wings folded,

Order I. Coleoptera. II. Orthoptera.

Cohors II. Siphonostoma,

Order III. Hemiptera.

Century II. GYMNOPTERA.

Wings naked.

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Cohors I. ODONTATA.

Mouth with mandibles, maxillæ, and lip. Wings four.

Order IV.—NEUROPTERA. V. HYMENOPTERA.

Cohors II. SIPHONOSTOMA.

Mouth tubular, formed for sucking.

Order VI. LEPIDOPTERA. VII. DIPTERA. VIII. SUCTORIA.

Latreille has retained the same general arrangement in his last work, *Considerations Générales sur l'Ordre Naturelle, &c.* but he has rejected the divisions into Legions, Centuries, and Cohorts.

Duméril, in his *Zoologie Analytique*, arranges insects into Eight Orders, the last of which also comprehends the Classes *Arachnoïda* and *Myriapoda*.

In 1812 Lamarck published a little work, entitled *Extrait du Cours de Zoologie du Muséum d'Histoire Naturelle*, in which he has continued the general arrangement published by him in 1801.

In 1815, vol. ix. of the *Edinburgh Encyclopædia* was published, in which Dr. Leach gave the following arrangement of Insects into Orders, and has added to them the *Parasita* and *Thysanoura*, which Latreille placed with the *Arachnoïda*.

Subclass I. AMETABOLIA.

Order I. THYSANURA. II. ANOPLURA.

Subclass II. METABOLIA.

Century I. ELYTHROPTERA.

Insects with elytra.

Cohors I. ODONTOSTOMATA.

Mouth with mandibles.

* *Metamorphosis incomplete.*

Order III. COLEOPTERA.

** *Metamorphosis nearly coarctate.*

Order IV. STREPSIPTERA.

*** *Metamorphosis semi-complete.*

Order V. DERMAPTERA. VI. ORTHOPTERA. VII. DICTYOPTERA.

Cohors II. SIPHONOSTOMATA.

Mouth with an articulated rostrum.

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Order VIII. Hemiptera. IX. Omoptera.

Century II. MEDAMOPTERA.

Insects without wings or elytra.

Order X. Aptera.

Century III. GYMNOPTERA.

Insects with wings but no elytra.

Cohors I. Glossostomata.

Mouth with a spiral tongue.

Order XI. Lepidoptera.

Cohors II. Gnathostomata.

Mouth with maxillæ and lip.

Order XII. Trichoptera.

Cohors III. Odontostomata.

Mouth with mandibles, maxillæ, and lip.

Order XIII. Neuroptera. XIV. Hymenoptera.

Cohors IV. Siphonostomata.

Mouth tubular, formed for sucking.

Order XV. Diptera.

As the above arrangement is subject to various objections, I shall adopt that since given by the same author in vol. iii. of his *Zoological Miscellany*.

Class V. *INSECTA.*

Subclass I. AMETABOLIA.

Insects undergoing no metamorphosis.

Order I. Thysanura.—*Tail* armed with setæ.

Order II. Anoplura.—*Tail* without setæ.

Subclass 2. METABOLIA.

Insects undergoing metamorphosis.

Order III. Coleoptera.—*Wings* two, transversely folded, covered by two crustaceous or hard coriaceous elytra, meeting (generally) with a straight suture. *Mouth* with mandibles. (*Metamorphosis* incomplete.)

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Order IV. Dermaptera.—*Wings* two, longitudinally and transversely folded. *Elytra* subcrustaceous, abbreviated, with the suture straight. *Mouth* with mandibles. (*Metamorphosis* semi-complete.)

Order V. Orthoptera.—*Wings* two, longitudinally folded, covered by two coriaceous elytra, the margin of one elytron covering the same part of the other. *Mouth* with mandibles. (*Metamorphosis* semi-complete.)

Order VI. Dictyoptera.—*Wings* two, longitudinally folded, twice or more, covered by two coriaceous elytra; one elytron decussating the other obliquely. *Mouth* with mandibles. (*Metamorphosis* semi-complete.)

Order VII. Hemiptera.—*Wings* two, covered by two crustaceous or coriaceous elytra (the tips of which are generally membranaceous), horizontal, one decussating the other obliquely. *Mouth* with an articulated rostrum. (*Metamorphosis* semi-complete.)

Order VIII. Omoptera.—*Wings* two, covered by two elytra which are entirely coriaceous or membranaceous; meeting obliquely with a straight suture. *Mouth* with an articulated rostrum. (*Metamorphosis* semi-complete or incomplete.)

Order IX. Aptera.—*No wings* or elytra. *Mouth* with a tubular jointed sucking rostrum. (*Metamorphosis* incomplete.)

Order X. Lepidoptera.—*Wings* four, membranaceous, covered with meal-like scales. *Mouth* with a spiral tongue. (*Metamorphosis* incomplete.)

Order XI. Trichoptera.—*Wings* four, membranaceous; the pterigostia or wing bones hairy. *Mouth* with maxillæ and lip. (*Metamorphosis* incomplete.)

Order XII. Neuroptera.—*Wings* four, membranaceous, generally of equal size, with numerous decussating pterigostia resembling a net-work. *Mouth* with mandibles, maxillæ, and lip. (*Metamorphosis* incomplete or semicomplete.)

Order XIII. Hymenoptera.—*Wings* four, membranaceous, the hinder ones always smallest; the pterigostia not decussating each other, so as to resemble a net-work. *Mouth* with mandibles, maxillæ and lip. (*Metamorphosis* incomplete.)

Order XIV. Rhipiptera.—*Wings* two, longitudinally folded. *Mouth* with mandibles. (*Metamorphosis* subcoarctate.)

Order XV. Diptera.—*Wings* two, with halteres or balancers at their base. *Mouth* tubular, formed for sucking. (*Metamorphosis* incomplete or subcoarctate.)

Order XVI. Omaloptera.—*Mouth* furnished with mandibles and

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elongated maxillæ: *lip* simple. *Wings* two or none. (*Metamorphosis* coarctata.)

Subclass I. INSECTA AMETABOLIA.

Order I. THYSANURA. *Leach.*

THYSANOURA. *Latreille.*

Tail furnished with setæ or filaments: *mouth* with mandibles, palpi, labrum, and labium.

The body of the animals which compose this Order is generally covered with scales or hair. Their motion is extremely rapid, or performed by leaping.

Fam. I. LEPISMADÆ. *Leach's MSS.*

Palpi very distinct and prominent, or exserted: *antennæ* composed of a vast number of very short joints: *tail* with three exserted setæ.

STIRPS 1.—*Body* depressed, and moving with a running motion: *tail* with three nearly equal filaments.

Genus 1. LEPISMA. *Linn., De Geer, Fabr., Latr., Leach.* SETOURA. *Brown.* FORBICINA. *Geoff., Lamarck.*

Antennæ inserted between the eyes: *maxillary palpi* slender, composed of five joints, the last of which is elongate and very slender: *labial palpi* with their joints compressed, dilated, and round: *eyes* small and remote.

Sp. 1. *Lep. saccharina.* Body covered with silvery scales.

Inhabits Europe. It is very common amongst books, clothes, &c. and wanders about during the night. It is supposed to have been originally introduced into Europe from America, where it is said to live amongst sugar.

STIRPS 2.—Body convex, with an arched back formed for springing. Tail with three setæ, the middle one longest.

Genus 2. FORBICINA. *Geoff., Leach.* LEPISMA. *Linn., Olivier.* MACHILIS. *Latr.*

Antennæ inserted under the eyes, shorter than the body: *maxillary palpi* thick, with six joints, the last conic: *labial palpi* with the apex membranaceous: *eyes* large and contiguous.

Sp. 1. *For. polypoda.* Smoky brown, with obscure rust-coloured spots.

Lepisma polypoda. *Linn.* Lepisma saccharina. *Vill. Ent.* 4. *tab.* 11. *fig.* 1. Machilis polypoda. *Latr. Gen. Crust. et Ins.* 1. p. 165. *tab.* 6. *fig.* 4. *magnified.* La Forbicine cylindrique. *Geoff.* Forbicina polypoda. *Leach.*

Inhabits all the temperate parts of Europe, and is found in woods and under stones.

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Genus 3. PETROBIUS. *Leach's Zoological Miscellany*, vol. iii. *tab.* 145. LEPISMA. *Fabr.?*

Antennæ longer than the body, inserted under the eyes: *maxillary palpi* six-jointed; the fifth joint inversely conic, the sixth conic: *labial palpi* with the last joint obliquely truncate, with the apex acute, and not membranaceous: *eyes* large and contiguous.

Sp. 1. *Pet. maritimus.* Blackish, with golden scales: feet yellowish: setæ of the tail annulated with white.

Inhabits all the rocky shores of Britain. Dr. Leach first observed this species on the Devonshire coast, and afterwards in Ireland, Scotland, and Wales. It is very active, runs fast, and leaps to a great distance. Dr. L. suspects that it has been confounded by Fabricius with *Forbicina polypoda.*

Fam. II. PODURADÆ. *Leach.*

Palpi not exserted nor very conspicuous: *antennæ* composed of four joints, the last sometimes formed of several other minute articulations: *tail* forked, and bent beneath the abdomen.

Genus 4. PODURA. *Linn., Geoff, De Geer., Fabr., Lam., Hermann, Leach.*

Antennæ with the last joint solid, not articulated: *abdomen* elongate, linear.

Sp. 1. *Pod. plumbea.* Lead-coloured, shining, with griseous head and feet.

Podura plumbea. *Linn., Fabr., Latr., Leach.* Podure plombée. *De Geer.* La Podure grise commune. *Geoff.*

Inhabits Europe under stones.

There are a great number of species in this and the following genus, which are worthy of attention. Fabricius has placed these two genera together without the slightest distinction, and has described several species, which it is hoped some future zoologist will be induced to examine.

Genus 5. SMYNTHURUS. *Latr., Leach.* PODURA. *Linn., Fabr., De Geer, Geoff.*

Sp. 1. *Smyn. fuscus.* Body entirely brown.

La Podure brun enfumée. *Geoff.* Podura atra. *Linn.? Fabr.* Smynthurus fuscus. *Latr., Leach.*

Inhabits Europe; is common on the ground and in damp hedges.

Order II. ANOPLURA. *Leach.*

PARASITA. *Latreille.*

Tail without setæ or filaments: *mouth* in some furnished with two teeth (or mandibles?) and an opening beneath; in others with a tubulose very short haustellum.

The animals of this Order are parasitical, and were by Latreille

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placed in an order which he named *Parasita*. This name Dr. Leach has changed for the sake of harmony, and also to render the name more easy of retention in the memory, the characters being drawn from the same parts.

Their motion is slow, and their nourishment is derived from the blood of mammalia, birds and insects.

"It is almost an established fact, that every species of bird (and probably mammiferous animal) has its own peculiar parasite; and there is no instance of the same species of louse having been observed on two distinct species of birds, although some birds (as the raven oyster-catcher, &c.) are infested with several species of parasites." The importance of clearly ascertaining the truth is such to the ornithologist, that Dr. Leach has employed a considerable portion of time for the purpose of investigating and of describing the species with accuracy, little more than a bare catalogue of names and habitats having been given in the works of Linné, Fabricius, and Gmelin. The result of his examinations he does not consider himself as able to communicate at present; but it is his intention, when the subject has arrived at maturity, to give a paper on this Order to the Linnean Society of London.

Fam. I. Pediculidæ. *Leach.*

Mouth consisting of a tubulose, very short haustellum.

Genus 6. PHTHIRUS. *Leach.* Pediculus. *Linn., Redi, Latr., Fabr.*

Anterior pair of feet simple; two hinder pair didactyle: *thorax* extremely short, scarcely visible.

Sp. 1. *Phth. inguinalis.* Body whitish.

Pediculus inguinalis. *Redi.* Pediculus pubis. *Linn., Fabr., Latr.* Le Morpion. *Geoff.* Phthirus inguinalis. *Leach.*

Inhabits the eyebrows, &c. of men and women, being commonly known under the titles Crabs, Crab-lice, &c.

Genus 7. PEDICULUS. *Linn., Fabr., De Geer, Geoff., Redi, Hermann, Lam., Leach.*

Feet all armed with a finger and thumb: *thorax* composed of three distinct equal segments.

Sp. 1. *Ped. humanus.* Body oval, lobate, white and nearly immaculate.

Pediculus humanus. *Fabr., Linn., Latr., Leach.*

Inhabits the bodies and garments of men, and is known by the name of the body-louse. On the continent of Europe, especially in Spain and Portugal, it is very abundant. In Britain it is of rare occurrence, and may have been introduced from the neighbouring countries.

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Sp. 2. *Ped. cervicalis.* Body oval, lobed, cinereous, with a black interrupted band on either side.

Le Pou ordinaire. *Geoff.* Pediculus humanus. *var. Linn.* Pediculus cervicalis. *Latr., Leach.*

Inhabits the heads of man throughout Europe. In Britain it is extremely common, especially in the heads and upper part of the necks of children, whence they are extracted by means of a fine-toothed comb, or are destroyed by rubbing calomel mixed with a little fat amongst the roots of the hair. This species has been by many authors confounded with the preceding species.

Genus 8. HÆMATOPINUS. *Leach.*

Thorax narrow and distinct from the abdomen: *abdomen* very broad.

Sp. 1. *Hæm. Suis.*

Pediculus Suis. *Linné.* Hæmatopinus Suis. *Leach's Zool. Misc.* iii. 66. *pl.* 146.

Inhabits swine.

Fam. II. NIRMIDÆ. *Leach.*

Mouth with a cavity, and two teeth or mandibles.

Genus 9. NIRMUS. *Hermann, Leach.* RICINUS. *De Geer, Oliv., Lam., Latr.* PEDICULUS. *Linn., Geoff., Fabr.*

The character of this genus is given in that of the tribe. All the species inhabit birds. The term *ricinus* having been used in botany is rejected, and that of Dr. Hermann's is adopted.

Sp. 1. *Nir. Cornicis.* Whitish: head heart-shaped; segments of the thorax on each side produced into a tooth: abdomen oval, transversely banded with brown.

Ricinus Cornicis. *Latr.*

Inhabits the *Corvus Cornix* of Linné.

Subclass II. INSECTA METABOLIA.

Order III. COLEOPTERA.

Order COLEOPTERA. *Linn., Cuv., Lam., Latr., &c.*

Class ELEUTERATA. *Fabr.*

This Order is divided into five great sections, from the general number of joints in the tarsi.

Section I.—PENTAMERA.

The number of joints in the tarsi is generally five, but in some of the aquatic genera the number is less.

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Fam. I. Cicindeliadæ. *Leach.*

Maxillary palpi four, the interior ones two-jointed: *labial* two: *antennæ* filiform, never moniliform: *maxillæ* furnished at their extremities with a distinct articulated hook: *mandibles* with many teeth: *feet* formed for running; hinder ones with trochanters.

All the insects of this family live on other insects.

Genus 10. CICINDELA. *Linn., De Geer, Fabr., &c.* Buprestis. *Geoff.*

Thorax short, almost as wide as the head: *abdomen* elongate quadrate: *elytra* flat, separate, rounded: *wings* two: *exterior maxillary palpi* as long or longer than the labial: *antennæ* inserted into the anterior margin of the eye: *clypeus* shorter than the labrum.

Sp. 1. *Cic. sylvatica.* Obscure æneous above; each elytron with an external lunule at the base, with a mark at the apex, and an intermediate transverse, narrow sinuated band of white; with many impressed punctures at the suture. (*Pl.* 3. *fig.* 8.)

Cicindela sylvatica. *Linn., Oliv., Latr.*

Inhabits Europe. Is found on Martlesome Heath, Suffolk, occasionally; near Christchurch in Hampshire; and near Cobham and Godalming in Surry it is very common.

There are three other British species, viz. 2. *C. campestris*, which is taken in sandy places and in highways in great plenty. 3. *C. hybrida*, found on the sea-shore dear Yarmouth and Swansea. 4. *C. Germanica*, which is common at a place called Black Gang-way in the Isle of Wight, and is occasionally found in chalk-pits near Dartford, Kent, in the months of June and July.

Fam. II. Carabidæ.

The mandibles of the *Carabidæ* are entirely porrected; their hinder legs are formed for running, and they feed on other insects.

"Professor F. A. Bonelli, of Turin, has lately written an admirable monograph on the European genera of this family. This is published under the title of *Observations Entomologiques*, and has been sanctioned by the Imperial Academy. From the parts studied it proves that Bonelli is a man of accurate judgement, and fully entitled to rank amongst the first entomologists of the present day." *Leach's MSS.*

Obs.—For the characters of most of the Genera in this extensive Family I am indebted to Dr. Leach, who with his usual liberality allowed me the free use of his MSS.

I. *Anterior tibiæ not notched within. Elytra entire, covering the whole abdomen. Antennæ linear or setaceous.*

Stirps 1.—*Palpi* with the fourth joint thicker than the third, the apex

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dilated: *antennæ* with the second joint as long or longer than the fourth: *wings* wanting, or two incomplete: *abdomen* oval or ovate.

Genus 11. CYCHRUS. *Fabr., Payk., Latr., Bonelli, Leach, Schönherr.*

Palpi with the fourth joint spoon-shaped: *lip* with the tooth of the notch simple: *labrum* bilobate: *elytra* deflexed, embracing the sides of the abdomen: *wings* none, or very short.

Dr. Leach has observed that the palpi of the male are larger than those of the female. Anterior tarsi in both sexes simple.

Sp. 1. *Cyc. rostratus.* Fabr., Panz., Latr., Leach, Schönherr.

Carabus rostratus. *Marsh. Ent. Brit.* i.

Inhabits pathways in woods, roots of trees, beneath stones, and under moss.

Genus 12. CARABUS *of authors.* Tachypus. *Weber.*

Palpi with their last joint securiform: *lip* with the tooth of its notch simple: *labrum* bilobate: *elytra* not embracing the abdomen: *wings* very short or entirely wanting.

The males have their anterior tarsi more or less dilated, and their thorax is evidently narrower than that of the females.

Sp. 1. *Car. violaceus.* Black; margins of the thorax and elytra violet-copper: elytra finely rugulose, somewhat smooth: abdomen elongate-oval.

Carabus violaceus. *Linn., Fabr., Oliv., Marsh., Latr.*

Inhabits Europe. It is frequent in Britain at the roots of trees, under stones, &c.

Sp. 2. *Car. catenulatus.* Black: margins of thorax and elytra violet: thorax broader than long, deeply emarginate behind; each elytron with about fourteen striæ; the fourth, eighth, and twelfth from the suture interrupted; the intervals with a distinct, somewhat rugose line: abdomen oval.

Carabus catenulatus. *Scop., Fabr., Latr.* Carabus intricatus. *Marsh., Oliv.*

Inhabits the south of France, Germany, and Britain. It is sometimes found quite black, at other times with a tinge of fine violet: and is very plentiful in this country.

Sp. 3. *Car. intricatus.* Black violet above, black beneath: thorax narrow, with nearly equal diameters: elytra with irregular striæ; the intervals punctate-rugose; each elytron with three elevated catenulated lines.

Carabus intricatus. *Linn., Latr.* Carabus cyaneus. *Fabr., Panz.*

Inhabits Europe. There is but one instance of its having occurred in Britain. Dr. Leach took a single specimen under a stone in a wood opposite the Virtuous Lady Mine, on the river Tavy below Tavistock in Devonshire, in the last week in May.

Sp. 4. *Car. nemoralis.* Black; margin of the elytra and sides of the

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thorax violet: elytra obscure, copper, rugulose, with three longitudinal rows of excavated spots.

Carabus nemoralis. *Illig.*, *Latr.* Carabus hortensis. *Oliv.*, *Marsh.*, *Fabr.*

Inhabits gardens, and is very common in this country.

Sp. 5. *Car. monilis.* Brassy-green or violet-black above, black beneath; each elytron with about fourteen elevated lines, two in the middle more distinct than the rest; the fourth, eighth, and twelfth from the suture catenulated: abdomen elongate-oval.

Carabus monilis. *Fabr.*, *Latr.* Carabus catenulatus. *Marsh.*

Inhabits France and Germany: in England it is found in gardens and pathways in June, July, and August.

Sp. 6. *Car. morbillosus.* Brassy or black copper above, black beneath; each elytron with three ribs, one at the suture; the interstices with a catenulated line, and on each side of it with a less distinct smooth punctate-rugose line: abdomen elongate-oval. (*Pl. 3. fig. 17.*)

Carabus morbillosus. *Fabr.*, *Latr.* Carabus granulatus. *Marsh.*

Inhabits Europe. In Britain it is found occasionally under stones and moist places, and in abundance in rotten willows in the winter.

Stirps 2.—*Palpi* with the fourth joint not thicker than the other joints: *antennæ* with the second joint shorter than the fourth: *wings* two, generally complete: *abdomen* quadrate.

Genus 13. CALOSOMA. *Web.*, *Fabr.*, *Latr.*, *Clairv.*, *Bonelli*, *Panz.*, *Leach.*

Palpi moderate, with equal joints: *lip* with the tooth of its notch simple: *antennæ* setaceous, straight: *abdomen* quadrate: *wings* two. (*Anterior tarsi* of the male with the three first joints very much dilated.)

Sp. 1. *Cal. Sycophanta.* Fabr.

Inhabits Europe; and although rare in Britain, has several times been taken near Dartmouth and Norwich.

Calosoma Inquisitor of Fabricius has been taken at Norwood in June by Mr. D. Bydder and Mr. W. Weatherhead, and by Dr. Leach near Tavistock in Devonshire; but it must be esteemed a rare British insect. It once occurred in great plenty near Windsor, on the white-thorn hedges, feeding on the larvæ of lepidopterous insects.

Genus 14. NEBRIA. *Latr.*, *Clairv.*, *Bonel.*, *Panz.*, *Leach*, *Gyll.*

Palpi moderately long: *labial* with equal joints: *maxillary* with the fourth joint longer than the preceding: *lip* with the tooth of its notch bifid: *antennæ* linear straight: *abdomen* elongate, quadrate: *wings* two: *thorax* truncate; the basilar angle straight. (*Anterior tarsi* of the male with their three first joints dilated.)

Sp. 1. *Neb. complanata.* Leach.

Carabus complanatus. *Linné.* (*Pl. 3. fig. 18.*) Carabus arenarius. *Fabr.*

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Inhabits the sandy shores of the sea near Swansea beneath drifted wood, where it was first discovered by Sir J. Banks, and twenty years after was likewise taken in great profusion by Dr. Leach.

The other British species are *N. livida*, *N. brevicollis*, and *N. Gyllenhalli*.

Genus 15. LEISTUS. *Frön., Clairv., Bonel., Panz.* POGONOPHORUS. *Latr., Leach, Gyll.*

Palpi elongate: *labial* with the third joint very long: *lip* with the tooth of its notch bifid: *antennæ* linear, deflexed: abdomen quadrate, oblong: wings two: thorax with the base truncate, the angles straight: (*mouth* spinose: *anterior tarsi* of the male with the three first joints dilated.)

Sp. 1. *Leistus cæruleus.* Latr.

Carabus spinibarbis. *Marsham.*

Inhabits sandy situations, and under stones in May and June.

II. *Anterior tibiæ emarginate within, or with an elevated internal spur. Elytra not truncate, most frequently covering the whole abdomen.*

A. *Palpi elongate. Anterior tarsi of the male generally with only two dilated joints. Thorax on each side rounded. (Palpi with the last joint deeply truncate.)*

Genus 16. PANAGÆUS. *Latr., Clairv., Bonel., Panz., Leach, Gyll.*

Mandibles acute, simple: *lip* with the tooth of its notch bifid: *neck* distinct: *mouth* acute: *palpi* with their fourth joint triangular: *wings* two: *thorax* suborbiculate, entire: (*anterior tarsi* of the male with the two first joints penicillate-dilated.)

Sp. 1. *Pan. Crux-major.* Latr.

Inhabits Europe. In Britain it is rare, but is occasionally found at the roots of trees, and in sandy situations.

STIRPS 3.—*Mandibles* obtuse or above towards their points emarginate-truncate or with a large and very obtuse tooth: *neck* none: *mouth* very obtuse: (*body* depressed.)

Genus 17. BADISTER. *Clairv., Latr., Bonel., Panz., Leach.* AMBLYCHUS. *Gyll.*

Palpi with their last joint oval: *thorax* anteriorly and posteriorly notched: *wings* two. (*Anterior tarsi* of the male with the three first joints dilated.)

Sp. 1. *Bad. bipustulatus.* Latr., Leach.

Inhabits Europe. In England it is found under stones, and in sandy situations.

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B. *Palpi moderately porrected. Anterior tarsi of the male with three or four dilated joints. (Neck none.)*

* *Anterior tibiæ notched on their hinder or lower side.*

STIRPS 4.—*Wings* two (habit of the *Cicindelidæ*).

Genus 18. NOTHIOPHILUS. *Duméril, Bonel., Panz., Leach.*

Labrum quadrate, its apex rounded: *labium* on each side dilated rounded: *lingula* rather long, broad, corneous: *thorax* flat, subquadrate, subtransverse, as broad as the head and abdomen: *eyes* prominent: *wings* two. (*Anterior tarsi* of the male not distinctly dilated.)

Sp. 1. *Not. aquaticus.* Panz.

Cicindela aquatica. *Marsh.*

Inhabits Europe, and is very common in Britain.

Genus 19. ELAPHRUS. *Fabr., Latr., Bonel., Leach,* &c.

Labrum transverse, truncate: *lip* on each side obliquely subtruncate: *lingula* short, narrow, membranaceous: *thorax* truncate-obcordate, convex and unequal, narrower than the head and abdomen: *eyes* very prominent. (*Anterior tarsi* of the male distinctly dilated.)

Sp. 1. *Elaph. riparius.* Fabr.

Inhabits the edges of ponds on Epping Forest, Coombe Wood, and Battersea Fields.

Genus 20. BEMBIDIUM. *Leach, Gyll.* BEMBIDION. *Latr., Bonel., Panz.* OCYDROMUS. *Frölich, Clairv.*

Labrum transverse: *thorax* narrower than the abdomen, and as broad as the head: *eyes* more or less prominent: *wings* two, generally perfect. (Anterior tarsi of the male with the first joint very much dilated.) *Maxillary palpi* with their last joint minute, abruptly narrower than the preceding joint.

Sp. 1. *Bemb. flavipes.* Latr.

Inhabits sandy places, and roots of grass.

Genus 21. CILLENUS. *Leach's MSS.*

Labrum transverse: *thorax* narrower than the abdomen and as broad as the head: *eyes* rather prominent: *wings* two, imperfect. *Anterior tarsi* with the second, third, and fourth joints transverse (of the male wider than those of the female: *body* depressed.)

Sp. 1. *Cill. lateralis.* Thorax purple bronze cordate with an impressed longitudinal line: elytra livid purple striated, with some impressed discoidal punctures, the striæ running together behind, margins of the elytra inflexed, base of the antennæ and legs testaceous: head purplish or greenish-bronze.

Inhabits the sea-shore. First discovered by Dr. Leach near Porto Bello on the Frith of Forth, and afterwards taken at Cromer in Norfolk, in great profusion.

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** *Anterior tibiæ notched on their interior side.*

STIRPS 5.—Palpi with their fourth joint conic acute.

Genus 22. TRECHUS. *Clairv., Latr., Bonel., Panz., Leach.*

Wings complete: *thorax* narrower behind, the hinder margin straight, the angles subrounded (*anterior* and *middle tarsi* of the male with the four first joints dilated).

This genus is very nearly allied to the insects of the next Stirps.

Sp. 1. *Tr. meridianus.* Clairv., Leach.

Inhabits the roots of grass and gardens.

Gen. 23. EPAPHIUS. *Leach's MSS.*

Eyes moderately large: *wings* none: *thorax* narrower behind, with the posterior margin straight, the angles acute. (*Anterior tarsi* of the male with two dilated joints.)

Sp. 1. *Epa. secalis.*

Carabus secalis. *Payk.*

Inhabits Europe: it is rare in Britain.

Genus 24. AËPUS. *Leach's MSS.*

Eyes very minute: *wings* none: *thorax* subtriangulate, the posterior apex deeply truncate.

Sp. 1. *Aëp. fulvescens.* Colour somewhat fulvescent; head and antennæ slightly tinted with ferrugineous.

Inhabits the southern coast of Devon, and is found under stones at the mouths of the rivers Tamar and Yalm.

STIRPS 6.—*Palpi* with their fourth joint truncate, never conic. (*Tarsi anterior* and *intermediate* of the male with four dilated joints.)

Genus 25. HARPALUS. *Latr., Bonel., Leach, Panz.*

Palpi with their fourth joint oval: *thorax* subquadrate transverse, with an impression on each side of its base: *wings* two.

Sp. 1. *Har. ruficornis.* Latr., Leach.

Inhabits Europe. Is common in Britain, under stones and in sandy situations.

STIRPS 7.—*Palpi* with their fourth joint never conic: *wings* two: *tibiæ* anterior, not palmate-dentated: *mandibles* short and simple: *lip* with the tooth of its notch simple: *thorax* as broad as the base of the abdomen: *Body* broad convex: *antennæ* linear: *tarsi* anterior of the male with three dilated joints; intermediate ones simple.

Genus 26. ZABRUS. *Clairv., Bonel., Panz., Leach.*

Palpi with their fourth joint shorter than the third: labrum emarginate: *anterior tibiæ* at their extremities with a triple spur: *thorax* quadrate, with its base transversely subimpressed: *body* gibbous oblong.

Sp. 1. *Zab. gibbus.*

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Carabus gibbus. *Fabr.* Carabus gibbosus. *Marsh.*
Inhabits Europe. Is found at the roots of grass in Battersea Fields. Its natural history is given in Germar's *Magazin der Entomologia* for 1813.

Genus 27. OODES. *Bonelli, Panz., Leach.*
Palpi with the third and fourth joints equal in length: *labrum* entire: *anterior tibiæ* at their extremity with a double spur: *thorax* broadest at its base, not transversely impressed: *body* slightly-convex oval.
Sp. 1. *Ood. helopoides.* Panz.
Inhabits Germany, and England on moist banks: it is sometimes found in Battersea Fields.

Stirps 8.—*Palpi* with their last joint never conic: *wings* two: *tibiæ* anterior not palmate-dentated: *mandibles* simple, or towards their bases denticulated: *lip* with the tooth of the notch simple: *thorax* obcordate, sessile, with the lateral impression obsolete or solitary: *body* depressed: *antennæ* linear: *tarsi* of the male with three dilated joints; intermediate tarsi simple.

Genus 28. LORICERA. *Latr., Clairv., Bonel., Panz., Leach.*
Antennæ setaceous, pilose, with the first five joints globose clavate: *neck* distinct.
Sp. 1. *Lor. ænea.* Latr., Leach.
Carabus pilicornis. *Marsh.*
Inhabits moist banks at the roots of grass.

Stirps 9.—*Palpi* with their last joint never conic: *wings* two: *tibiæ* anterior not palmate-dentate: *mandibles* simple, or towards their bases denticulated: *lip* with the tooth of its notch simple: *thorax* obcordate, sessile, with the lateral impression obsolete or solitary: *body* depressed: *antennæ* linear: *tarsi* anterior of the male with three dilated joints; intermediate tarsi simple.

Genus 29. CALLISTUS. *Bonelli, Panz., Leach.*
Palpi with their last joint oval, subacuminate and of the same length with the third joint; *labrum* much notched, its base narrowed; *thorax* convex punctate, the basal angles straight: *body* convex.
Sp. 1. *Cal. lunatus.*
Carabus lunatus. *Fabr.*
Inhabits Europe. It is very rare in Britain.

Genus 30. AGONUM. *Bonelli, Panz., Leach.*
Palpi with the last joint oval, truncate and of the same length with the third joint: *labrum* transverse, quadrate, entire: *thorax* flat, smooth, the basal angles rounded: *body* depressed.
Sp. 1. *Ag. sex-punctatum.*
Carabus sex-punctatus. *Fabr.*

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Inhabits moist places. In Coombe Wood it has been found very abundant. (*Pl. 3. fig. 20.*)

Genus 31. SYNUCHUS. *Gyllenhall, Leach.*

Intermediate palpi with their last joint cylindric elongate, the apex truncate; *hinder palpi* with their last joint thickened at their extremity, the apex obliquely acuminated: *thorax, labrum,* and *body* as in Agonum.

Sp. 1. *Syn. vivalis.*

Carabus vivalis. *Illig.*

Inhabits

Genus 32. ANCHOMENUS. *Bonelli, Panz., Leach.*

Palpi with their fourth oval, scarcely truncate, of the length of the third joint: *labrum* quadrate, transverse entire: *thorax* flat, smooth, the basal angles straight: *body* rather depressed.

Sp. 1. *Anc. prasinus.*

Harpalus prasinus. *Latr., Leach.*

Inhabits

STIRPS 10.—*Palpi* with their last joint never conic: *wings* two: *tibiæ anterior* not palmate-dentate: *mandibles* simple, or towards their base denticulated: *lip* with its notch-tooth bifid: *thorax* obcordate or suborbiculate-sessile: *body* moderately or very much elongated: *tarsi* anterior of the male with three or four dilated joints; intermediate tarsi simple.

* *Antennæ compressed, narrower towards their extremities* (*thorax obsolete*).

Genus 33. PLATYSMA. *Bonelli, Panz., Leach.*

Palpi with their fourth joint cylindric, its base attenuated; those of the maxillæ with their fourth joint shorter than the preceding: *thorax* with the base on each side with two striæ, the exterior stria very small: *basal* angles straight: (*body* depressed.)

Sp. 1. *Pl. nigritum.*

Carabus nigritus. *Fabr.* Carabus aterrimus. *Marsh.*

Inhabits damp woods.

Genus 34. CHLÆNIUS. *Bonelli, Panz., Leach.*

Palpi with the fourth joint oval, of the length of the third joint: *thorax* with its base on each side with one stria: (*body* punctulate, varied with colour; elytra generally with a pale margin.)

Sp. 1. *Chl. festivus.*

Carabus festivus. *Fabr.* Car. vestitus. *Marsh.*

Inhabits moist banks and woods.

Genus 35. EPOMIS. *Bonelli, Panz., Leach.*

Palpi with their fourth joint triangular, compressed; maxillary ones with their fourth joint shorter than the third: *thorax* with one stria on each side of its base.

Sp. 1. *Ep. cincta.*

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Carabus cinctus. *Panz.*
Inhabits the fields near Bristol and Plymouth.

** *Antennæ linear.*

Genus 36. SPHODRUS. *Clairv., Bonel., Panz., Leach.*

Palpi with their fourth joint cylindric: *labial* attenuated at their base, shorter than the third: *mandibles* elongate: *antennæ* with their third joint elongate, as long as the two first taken together: *thorax* obcordate, the base on each side with one stria, the angles straight: (*wings* sometimes abbreviated: *front tarsi* of the male with four dilated joints.)

Sp. 1. *Sph. planus.* Clairv.
Carabus leucophthalmus. *Linné.*
Inhabits houses.

Genus 37. AMARA. *Bonelli, Panzer, Leach.*

Palpi with their fourth joint oval, of the length of the third: *mandibles* short: *antennæ* with their third joint shorter than the first: *thorax* broad, its base transversely impressed; hinder angles straight.

This genus contains *Carabus vulgaris* of Linné, and its affinities, all of which have the fore tarsi of the male with three dilated joints.

*** *Antennæ compressed, thicker towards their extremities. Palpi with their fourth joint elongate, oval, or subcylindric.*

Genus 38. BLETHISA. *Bonelli, Panz.* HELOBIUM. *Leach.*

Maxillary palpi with the fourth shorter than the third joint: *labrum* emarginate: *mandibles* with their base subdenticulated: *thorax* obcordate, the base on each side with one stria (*elytra* with large excavated dots): *anterior tibiæ* with their notch near the apex: *anterior tarsi* of the male with four dilated joints: *wings* perfect.

Sp. 1. *Blc. multipunctata.*
Car. multipunctatus. *Fabr.*
Inhabits moist places; it occurs occasionally in Battersea Fields.

Genus 39. CALATHUS. *Bonelli, Panz., Leach.*

Maxillary palpi with the fourth joint of the length of the third: *labrum* entire: *mandibles* with their base multidentate: *thorax trapeziform,* rather flat, behind on each side punctulate impressed: *body* elliptic: *wings* generally abbreviated: *anterior tarsi* of the male with three dilated joints.

Sp. 1. *Cal. cisteloides.* Panz.
Carabus cisteloides. *Illig.*
Inhabits under stones and the bark of trees.

Genus 40. POECILLUS. *Bonelli, Panz., Leach.*

Maxillary palpi with the first joint of the length of the third: *labrum* truncate entire, or scarcely notched: *mandibles* with their base subdenticulated: *thorax* with its base narrower, with two striæ on each side, the exterior stria very small, or with obliterated impressed dots: *wings* sometimes abbreviated: (*anterior tarsi* of the males with three dilated joints.)

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Sp. 1. *Poe. cupreus.*
Carabus cupreus. *Linné.*
Inhabits sand-pits and path-ways.

STIRPS 11.—*Palpi* with their last joint never conic: *wings* two: *tibiæ anterior* not palmate-dentate: *mandibles* sharp within or strongly unidentate: *lip* with the tooth of its notch simple: *thorax* obcordate, its base very narrow or pedunculated: *body* convex most often elongate: *head* large: *tarsi* anterior of the male with three or four dilated joints; intermediate tarsi simple.

Genus 41. STOMIS. *Clairville, Bonelli, Panz., Leach.*
Mandibles very porrect without teeth internally, that of its right side with its middle incised: *palpi* with the fourth joint oval, *maxillary* ones with the fourth joint larger than the third: *labrum* bilobate: *lip* on each side subrounded: *antennæ* longer than the thorax, the third joint as long as the fourth: *thorax* oblong: *wings* none: (*anterior tarsi* of the male with three dilated joints.)
Sp. 1. *Sto. pumicatus.*
Carabus pumicatus. *Illig.* Car. tenuis. *Marsh.*
Inhabits moist banks at the roots of grass.

Genus 42. BROSCUS. *Panzer, Leach.* CEPHALOTES. *Bonelli.*
Mandibles moderate, their middle internally with one tooth; *labial palpi* with their fourth joint obconic; *maxillary* ones with the same joint of the length of the third, cylindric: *labrum* transversely quadrate, entire: *lip* rounded on each side: *antennæ* as long as the thorax, with the third joint as long as the fourth: *thorax* with equal diameters: *wings* perfect: (*anterior tarsi* of the male with three dilated joints.)
Sp. 1. *Bros. cephalotes.*
Carabus cephalotes. *Fabr.*
Inhabits the sea shores near Swansea.

STIRPS 12.—*Palpi* with their last joint never conic: *wings* two or none: *tibiæ* anterior palmate dentate: *thorax* pedunculated: *lip* with the tooth of its notch simple.

Genus 43. CLIVINA. *Latr., Clairv., Bonel., Panz., Leach.*
Mandibles denticulated from their base to their apex: *thorax* quadrate: *anteror tibiæ* externally and at their apex digitated: *wings* two, sometimes incomplete.
Sp. 1. *Cli. Fossor.*
Tenebrio Fossor. *Linné.* Clivina arenaria. *Latr.* Carabus distans. *Marsh.*
Inhabits sandy situations.

Genus 44. DYSCHIRIUS. *Panzer, Leach.*
Mandibles denticulated at their base: *thorax* globose: *anterior tibiæ* with their extremities (rarely also externally slightly) digitated: *wings* two perfect.
Sp. 1. *Dys. gibbus.*

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Clivina gibba. *Latr., Leach.*
Inhabits moist places; is pretty common at Battersea.

Stirps 13.—*Palpi* with their last joint oval, wings none: *tibiæ* anterior not palmate-dentated: *thorax* sessile; *lip* with the tooth of its notch bifid: *tibiæ* of the third pair of legs behind spinulose: (*elytra* with no impressed discoidal spots: anus in both sexes very smooth.)

* *Antennæ setaceous.*

Genus 45. ABAX. *Bonelli, Panzer, Leach.*

Body broad, equal depressed: *elytra* united, their shoulders carinate plicate: *antennæ* rather longer than the thorax: *thorax* transversely quadrate, the base on each side with two striæ, the basal angles straight: (*anterior tarsi* of the male with three dilated joints.)

Sp. 1. *Abax Striola.*
Carabus Striola. *Fabr.* Car. depressus. *Oliv.*
Inhabits beneath the bark of trees and under stones.

Stirps 14.—*Wings* incomplete or none: *tibiæ* anterior simple: *thorax* sessile: *lip* with the tooth of its notch simple and obtuse: (*elytra* obliquely emarginate-truncate, without any larger impressed, discoidal spots.)

Genus 46. CYMINDIS. *Latr., Bonel., Panz., Leach.* Tarus. *Clairv.* Cymidis. *Gyll.*

Labrum subquadrate, emarginate: *maxillary palpi* with the fourth joint rounded oval, of the labial palpi compressed, its apex more or less dilated: *wings* none, or very imperfect.

Sp. 1. *Cym. humeralis.*
Carabus humeralis. *Fabr.*
Inhabits moist banks.

III. *Anterior tibiæ notched at their internal side before the apex. Elytra abruptly truncated, shorter than the abdomen. Wings complete in both sexes.*

Stirps 15.—*Palpi* short filiform: *lip* with its notch simple, or with a bifid tooth: *mandibles* dentate at their base: *palpi* with their fourth joint deeply truncate: *thorax* oblong: *body* convex: *wings* two or none: *neck* none: *labrum* transverse: *tarsi* with their fourth joints simple.

Genus 47. BRACHINUS. *Fabr., Bonel., Clairv., Latr., Panz., Schönh., Leach.*

Lip with the tooth of its notch wanting: *labrum* not or scarcely emarginate: *labial palpi* with their fourth joint rounded, oval: *elytra* slightly truncated: *legs* moderately long: *wings* two.

Sp. 1. *Bra. crepitans.* Fabr.
Carabus crepitans. *Linné, Marsh.*
Inhabits under stones, near Gravesend in profusion, and occasionally beneath clods of earth in ploughed fields in May. (*Pl. 3. fig. 19.*)

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STIRPS 16.—*Palpi* short, filiform, the fourth joint truncate, with the tooth of its notch acute: *mandibles* without teeth: *thorax* transverse: *body* depressed, broad: *wings* two: *neck* none: *labrum* entire.

Genus 48. LAMPRIAS. *Bonelli, Panz.* ECHIMUTHUS. *Leach.*

Tarsi with their fourth joint simple: *antennæ* linear: *wings* short.

Sp. 1. *Lam. cyanocephala.* Intense blue-green; first joint of the antennæ, thorax, thighs, and tibiæ red; elytra with punctured striæ, the spaces between the striæ punctured; knees black.

Carabus cyanocephalus. *Linné, Schönher.* Echimuthus cyanocephalus. *Leach.*

Inhabits Europe: is very rare in Britain, where it was first discovered by Dr. Leach.

Sp. 2. *Lam. chlorocephala.* Intense green; the three first joints of the antennæ, thorax, and legs red; elytra with punctured striæ, the spaces between the striæ very obsoletely and irregularly punctulated; tarsi black.

Carabus cyanocephalus. *Marsham.*

Inhabits the broom and under the bark of trees. It is very abundant occasionally in Coombe Wood, near London, and is not uncommon in other parts of Britain:—it has been considered as *L. cyanocephala* by all British collectors.

Genus 49. LEBIA. *Latr., Bonelli, Panz., Leach.*

Tarsi with their fourth joint bifid: *antennæ* more slender at their base: *wings* long. The palpi of this genus are scarcely truncate.

Sp. 1. *Leb. Crux-minor.*

Carabus Crux-minor. *Linné.*

Inhabits Europe: in Britain it is very rare.

STIRPS 17.—*Palpi* short, filiform: *lip* with the tooth of its notch acute: *mandibles* dentated at their bases: *palpi* with their fourth joints scarcely truncated: *thorax* with subequal diameters, or longer than broad: *body* depressed, flat, narrow: *wings* two: *labrum* emarginate.

Genus 50. DROMIUS. *Bonelli, Leach.*

Tarsi with their fourth joint simple: *head* not remarkably produced behind: *thorax* obcordate, margined flat, a little broader than long.

Sp. 1. *Dro. quadrimaculatus.*

Lebia 4-maculata. *Latr.*

Inhabits beneath the bark of trees during the winter months.

Genus 51. DEMETRIAS. *Bonelli.* RISOPHILUS. *Leach.*

Tarsi with the fourth joints bifid: *head* behind very much produced: *thorax* rather longer than broad, obcordate, margined, narrower than the head.

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Sp. 1. *Dem. atricapilla.* Body pale yellowish: head black: mouth and thorax reddish: elytra very obsoletely striated: wings elongated; epigastrium and base of the belly fuscous.

Lebia atricapilla. *Latr.*

Inhabits beneath the bark of trees.

Sp. 2. *Dem. monostigma.* Body pale yellowish: head black: thorax reddish: elytra obsoletely striated, towards their tips with one fuscous spot: wings abbreviated.

Risophilus monostigma. *Leach.*

Inhabits Europe amongst the roots of plants. It is very common near Swansea.

Genus 52. ODACANTHA. *Fabr., Latr., Bonel., Clairv., Panz., Leach, Gyll.*

Tarsi with their fourth joint simple: *head* behind much produced: *thorax* oblong, subcylindric, narrower than the head.

Sp. 1. *Odacantha melanura.*

Attelabus melanurus. *Linné.*

Inhabits marshes in Norfolk and near Swansea.

Stirps 18.—*Palpi* very much elongated, the fourth joint with its apex dilated: *lip* with the tooth of its notch bifid: *labrum* trilobate, the middle lobe largest: *mandibles* very prominent: (*maxillæ* with a very thin perpendicular claw: *tarsi* with the fourth joint bifid: *neck* distinct.)

Genus 53. DRYPTA. *Latr., Fabr., Bonel., Panz., Leach.* Carabus. *Rossi, Marsh.* Cicindela. *Oliv.*

Thorax cylindric: *head* narrowed or lengthened behind: *mandibles* much elongated and very prominent: exterior maxillary and labial palpi terminated by a large nearly obconic joint, (maxillary ones much lengthened:) *lip* elongate linear, with two auricles.

Sp. 1. *Dryp. emarginata.* Blue, punctate, villose: mouth, antennæ, and feet red: thorax with an impressed longitudinal line; elytra with punctured striæ; apex of the first and middle of the third joint of the antennæ brown.

Drypta emarginata. *Fabr. Latr. Gen. Crust. et Insect.* i. 197. *tab.* 7. *fig.* 3. *Leach, Edin. Encycl.* ix. 81. Carabus chrysostomus. *Marsham.*

Inhabits Europe. In Britain it is rare; but has been taken near Hastings and Faversham.

Fam. III. Dyticidæ. *Leach.*

Hydrocanthari. *Latreille.*

Dyticus. *Geoffroy.*

Dytiscus. *Linné*, &c.

All the Dyticidæ inhabit the water, both in the state of larvæ

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and when perfect, living on other insects. The anterior and middle tarsi in some of the genera have but four joints.

A. *With a scutellum, feet formed for walking: tarsi, the whole of them with five joints; claws didactyle.*

STIRPS 1.—*Hinder thighs* covered at their base with a shield-shaped plate.

Genus 54. HALIPLUS. *Latr., Gyll., Leach.* CNEMIDOTUS. *Illig.* HOPLITUS. *Clairv.*

"* *Body oblong oval. Elytra with elevated ridges.*" Leach.

Labial and external maxillary palpi subulate.
Sp. 1. *Hal. elevatus.* Panz.
Inhabits running streams.

"** *Body oval. Elytra striated.*" Leach.

Sp. 2. *Hal. ferrugineus.* Linné.
Inhabits ponds and ditches.

STIRPS 2.—*Hinder thighs* without the shield at their base: (*eyes* prominent.)

Genus 55. PÆLOBIUS. *Schönherr, Leach.* HYGROBIA. *Latreille.* HYDRACHNA. *Fabr.*

External maxillary palpi with the last joint subclavate.
Sp. 1. *Pæl. Hermanni.* Black: head, transverse band on the thorax, base and border of the elytra and feet ferrugineous. (*Pl. 3. fig. 14.*)
Dytiscus Hermanni. *Marsh., Oliv.*
Inhabits ponds. The last segment of the abdomen when rubbed against the elytra produce a noise.

B. *Scutellum none. Feet, hinder ones, for the most part formed for swimming.*

STIRPS 3.—The four *anterior tarsi* with four, the *two posterior* with five joints.

Genus 56. HYPHYDRUS. *Latr., Gyll., Illig., Schönh., Leach.*

Body nearly globose: the four anterior tarsi with the last joint short; the hinder feet with but one claw.
Sp. 1. *Hyp. ovatus.* Obscure, ferrugineous, impunctate; the base of the elytra with an impression at the base of the suture.
Dytiscus ovatus. *Linné.*
Inhabits ponds.

Genus 57. HYDROPORUS. *Clairville, Leach.* HYPHYDRUS. *Illig., Schönh., Gyll.*

Body oval; the breadth exceeding the height: the four *anterior tarsi* with four joints, the last joint slender: *claws* didactyle.

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* *Body elongated.*

Sp. 1. *Hyp. 12-pustulatus.*
Inhabits ponds and ditches.

** *Body oval.*

Sp. 1. *Hyp. confluens.*
Dytiscus confluens. *Marsham.*
Inhabits ponds and ditches.

STIRPS 5.—All the *tarsi* with five articulations.

Genus 58. NOTERUS. *Clairv., Latr., Leach.*

Antennæ with a fifth or seventh joint dilated: *hinder feet* but slightly adapted for swimming.

Sp. 1. *Not. Geerii.* Oval, convex, brown: head and thorax ferruginous: elytra sprinkled with impressed dots: antennæ of the male thick.
Dytiscus crassicornis *of authors.* Dytis clavicornis. *De Geer.*
Inhabits stagnant waters.

Sp. 2. *Not. sparsus.* Elytra with impressed dots.
Dytiscus sparsus. *Marsh.*, i. 430.
Inhabits stagnant waters near London.

Genus 59. LACCOPHILUS. *Leach, Edin. Encycl.* vol. ix.

Antennæ with the joints simple: *hinder feet* well adapted for swimming.

Sp. 1. *Lac. hyalinus.*
Inhabits canals and slowly running waters.

Sp. 2. *Lac. minutus.* Greenish-testaceous: legs yellowish.
Dytiscus minutus. *Linné, Marsh., Gyll.*
Inhabits stagnant waters.

C. *With a scutellum: hinder feet compressed and formed for swimming: all the tarsi with five articulations.*

STIRPS 6.—*Tibiæ* posterior elongated: *claws* on the hinder feet didactyle.

Genus 60. COLYMBETES. *Clairville, Latr., Leach.*

External maxillary palpi with the second and third joint equal; fourth long, obtuse at the apex.

Sp. 1. *Col. striatus.*
Inhabits stagnant waters.
Sp. 2. *Col. maculatus.* (*Pl.* 3. *fig.* 15.)
Inhabits ditches.

Genus 61. HYDATICUS. *Leach, Edinb. Encycl.* vol. ix.

External maxillary palpi with the second joint short, third and fourth long but equal and subulated: *anterior tarsi* of the male patelliform: female with the thorax rough on both sides: *elytra* smooth.

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Sp. 1. *Hyd. Hybneri.* Black; front and margin of the thorax ferrugineous, margins of the elytra yellow with black spots.
Dytiscus parapleurus. *Marsh.*
Inhabits ponds: is of rare occurrence near London.

Genus 62. ACILIUS. *Leach's Zool. Misc.* vol. iii.

External maxillary palpi with the second joint obconic, third elongate obconic, fourth longer, nearly cylindrical, and rounded at its apex. *Anterior tarsi* of the male patelliform: *elytra* of the female sulcated.

Sp. 1. *Ac. sulcatus.*
Dytiscus sulcatus *of authors.*
Inhabits ponds and stagnant waters, and is very common.

Genus 63. DYTICUS. *Geoff., Illig., Leach.* DYTISCUS. *Linné, Fabr., Latr., Marsh.*

External maxillary palpi with the third and following joint of equal length; the last gradually increasing from the middle: *anterior tarsi* of the male patelliform: (*Pl.* 3. *fig.* 13. a.) *elytra* of the female sulcated.

Sp. 1. *Dyt. marginalis.* Ovate, olive-black above, luteous red beneath; the scutellum of the same colour with the elytra: clypeus, whole margin of the thorax, and border of the elytra, red clay-colour; bifurcature of the sternum lanceolate. (*Pl.* 3. *fig.* 13. c.)
Inhabits Europe. In Britain it is common in ponds at all seasons of the year.

Dytiscus circumflexus of Fabricius is abundant in the ponds near London. It is distinguished from *marginalis* by its more elongate shape, by the bifurcate process of the sternum being spine-shaped, and by the colour of the scutellum, which is invariably ferruginous. (*Pl.* 3. *fig.* 13. b. *sternum.*)

Fam. IV. GYRINIDÆ. *Leach.*

Internal maxillary palpi composed of one part: *antennæ* very short: *eyes* divided so as to appear as four: *four hinder feet* compressed, foliaceous, formed for swimming.

Genus 64. GYRINUS. *Linn., Fabr, Latr., Gyll., Leach.*

" * *Elytra naked, with punctured striæ.*" Leach.

Sp. 1. *Gyr. Natator.* Oval: elytra with punctured striæ; the inflexed margin testaceous. (*Pl.* 2. *fig.* 2. a. *antennæ magnified.* b. *the hinder leg magnified.*)
Inhabits stagnant waters.

" ** *Elytra smooth, villose.*" Leach.

Sp. 2. *Gyr. villosus.* Fabr., Gyll.
Gyrinus Moderii. *Marsham.*
Inhabits rivers and running waters.

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Fam. V. BUPRESTIADÆ. *Leach.*

Mandibles with their extremities entire: *antennæ* filiform or setaceous, often pectinated or serrated: *body* convex.

I. *Palpi filiform.*

Genus 65. BUPRESTIS. *Linn., Fabr., Latr., Marsh., Leach.*

Antennæ filiform, serrated in both sexes: *thorax* with the hinder margin applied to the base of the elytra: *body* cylindric linear.

Sp. 1. *Bup. biguttata.* Green above, blue-green beneath; scutellum transversely impressed: apex of the elytra serrated; a white villose spot on each side of the suture, and three on the sides of the abdomen.

Buprestis biguttata. *Fabr., Oliv., Marsh., Latr., Leach.*

Inhabits France and Germany. In England it is very rare.

Sp. 2. *Bup. viridis.* (*Pl.* 3. *fig.* 9. a. *antennæ magnified.*)

Inhabits the birch and nut-tree.

Genus 66. TRACHYS. *Fabr., Gyll., Leach.*

Antennæ serrated and filiform: *thorax* with the hinder margin lobed and applied to the base of the elytra: *scutellum* obsolete: *body* short, ovate or triangular.

Sp. 1. *Tra. minuta.* Coppery-brown above; front impressed: elytra with slightly elevated spaces and transverse undulating bands of white hair.

Buprestis minuta. *Linn., Marsh., Latr.* Trachys minuta. *Gyll., Fabr., Leach.*

Inhabits the birch and nut-tree in June and July.

Genus 67. APHANISTICUS. *Latr., Leach.*

Antennæ massive.

Sp. 1. *Aph. emarginatus.* Latr., Leach.

Buprestis emarginatus. *Fabr.*

Inhabits France and England.

II. *Palpi terminated by a thick joint.*

Genus 68. MELASIS. *Oliv., Fabr., Latr., Leach.* ELATER. *Linn.*

Tarsi with entire joints.

Sp. 1. *Mel. flabellicornis.* Obscure blackish: antennæ, tibiæ, and tarsi red-brown: head punctate; thorax rough, with elevated punctures, having an impressed dorsal line: elytra finely rugulose and striated.

Elater buprestoides. *Linn.* Melasis flabellicornis. *Oliv., Panz., Fabr., Leach.* Melasis buprestoides. *Latr.*

Inhabits Germany and the south of France. In England it has been once taken by Mr. J. Curtis, of Norwich, an excellent artist and an industrious entomologist; and several times near Windsor, where it was first observed by Mr. Herschel.

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Fam. VI. ELATERIDÆ. *Leach.*

Palpi thick at their extremities: *antennæ* filiform: *body* formed for leaping: *hinder thighs* with a trochanter.

Genus 69. CERATOPHYTUM. *Leach.* CEROPHYTUM, *Latr.*

Mandibles without notch at their extremities: *tarsi* with their last joint but one bifid.

Sp. 1. *Cer. Latreillii.* Leach.

Cerophytum Elateroides. *Latr., Leach.*

Inhabits Germany, Switzerland, France, and England. In the latter country it was discovered by Mr. Millard in the New Forest, Hants.

OBS.—Latreille referred this genus to the preceding family (as a section of his family *Sterroxi*); but it has been referred to the *Elateridæ* by Dr. Leach in his MSS.

Genus 70. ELATER *of authors.*

Mandibles notched or bifid at their extremities: *tarsi* with all their joints entire.

This genus should be divided into several others, but the characters have not yet been developed. They may be divided into the following sections, as given by Latreille in his *Genera Crustaceorum et Insectorum.*

* *The last joint of the antennæ with the apex so abruptly acuminated as to give the appearance of a twelfth joint.*

Sp. 1. *Elat. ferrugineus.* Antennæ serrated; colour black: thorax with the exception of the hinder margin and elytra red, finely punctated, pubescent: elytra with punctured striæ.

Elater ferrugineus. *Linn., Fabr., Oliv., Panz., Marsh., Leach.*

Inhabits rotten trees, especially willows. In Britain it is very rare. It sometimes occurs in Kent; varies in size and colour. In Dr. Leach's collection (now in the British Museum) is a variety with the thorax entirely black.

** *Last joint of the antennæ oval or oblong, not abruptly acuminate.*

I. *Body not linear, but three times as long as broad; abdomen oblong-triangulate.*

A. *Antennæ (of the male at least) pectinated or serrated.*

Sp. 2. *Elat. castaneus.* Antennæ of the male pectinated, colour black: head and thorax red-tomentose: elytra yellow punctate-striated: apex black.

Elater castaneus. *Linn., Fabr., Panz., Leach.*

Inhabits

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B. *Antennæ simple: joints conic.*

Sp. 3. *Elat. murinus.* Black-fuscous, clouded with cinereous down: thorax bituberculate: antennæ and tarsi red.
Elater murinus. *Linn., Fabr., Marsh., Leach.*

Inhabits Europe. Is common on thistles, willows, and under stones in sandy situations.

II. *Body linear, nearly four times longer than broad: thorax oblong-quadrate.*

Sp. 4. *Elat. marginatus.* Black: front retuse: antennæ, sides of the thorax, feet, anus, and hinder margins of the abdominal segments, brownish-yellow; suture and outer margin of the elytra black.
Elater marginatus. *Linn., Fabr., Oliv., Marsh., Leach.*
Inhabits various herbaceous plants in fields.

Plate 3. represents fig. 7, Elater æneus, *Linn.*, E. cyaneus, *Marsh.*— fig. 6. E. semiruber, *Hoffmannsegg's MSS.* a species very common in the New Forest, Hampshire; and has, together with many other species, been confounded under the general name *sanguineus.*

Fam. VII. Telephoridæ. *Leach.*

Tarsi with the last joint but one bifid: *antennæ* filiform, composed of ten joints: *elytra* soft, flexible: *thorax* nearly quadrate or semicircular.

Genus 71. DASCILLUS. *Latr.* Atopa. *Paykull, Fabr., Leach.* Chrysomela. *Linn.* Crioceris. *Marsh.* Cistela. *Olivier.*

Maxillary palpi filiform, the last joint somewhat cylindric: *labial palpi* not bifurcate: *body* ovate: *feet* simple.

Sp. 1. *Das. cervina.* Black, with cinereous down: antennæ, feet and elytra, pale yellow.
Chrysomela cervina. *Linn.* Atopa cervina. *Payk., Fabr., Leach.* Dascillus cervinus. *Latr.*
Inhabits hedges and woods.

Genus 72. ELODES. *Latr.* Cyphon. *Fabr., Payk., Gyll., Leach.*

Maxillary palpi filiform, the last joint somewhat cylindric: *labial palpi* bifurcate: *body* sub-ovate or round-ovate: *feet* with their tibiæ simple, and their thighs not thickened.

Sp. 1. *El. pallida.* Sub-ovate, pale-red, punctulated, pubescent: eyes, antennæ (with the exception of their base), apex of the elytra, and abdomen, blackish: thorax somewhat semicircular, transverse, lobate behind.
Elodes pallida. *Latr.* Cyphon pallidus. *Fabr., Leach.*
Inhabits the white-thorn and umbelliferous plants.

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Genus 73. SCIRTES. *Illiger, Leach.* CYPHON. *Payk., Fabr.* ELODES. *Latr.* CHRYSOMELA. *Linn., Marsh.*

Maxillary palpi filiform, the last joint somewhat cylindric: *labial palpi* bifurcate: *body* ovate, inclining to round, convex: *feet* with their tibiæ terminated with a strong spine: *hinder thighs* thickened and formed for leaping.

Sp. 1. *Scir. hemisphærica.* Black, smooth: thorax short, transverse, anterior margin somewhat concave: tibiæ, tarsi, and base of the antennæ pale fuscous.

Cyphon hemisphæricus. *Fabr., Payk.* Elodes hemisphærica. *Latr.* Chrysomela hemisphærica. *Marsh.*

Inhabits aquatic plants in ditches.

Genus 74. DRILUS. *Oliv., Lam., Latr.* PTILINUS. *Fabr., Geoff.* CANTHARIS. *Marsh.*

Maxillary palpi with their apex acute; *labial* short, somewhat cylindric: *antennæ* with their internal edge pectinated: *maxillæ* with one process: *mandibles* notched at their points: *body* soft, anteriorly arcuate, inflexed.

Sp. 1. *Dri. flavescens.* Black, pubescent: elytra yellowish.

Drilus flavescens. *Oliv., Latr., Leach.* Cantharis serraticornis. *Marsham.*

Inhabits Europe. Is found in Darent Wood, Kent, amongst grass in tolerable abundance, some years.

Genus 75. LYCUS. *Fabr., Oliv., Lam., Leach.* CANTHARIS. *Linn.* LAMPYRIS. *Geoff., Marsh.*

Mandibles with their entire end pointed: *antennæ* compressed, more or less serrate, inserted near each other: *palpi* of the maxillæ with the last joint somewhat triangular, having their points broader: *head* with the mouth produced into a kind of rostrum: *maxillæ* with one process: *elytra* nearly of equal breadth: *thorax* somewhat quadrate, the anterior margin transverse, straight.

Sp. 1. *Ly. minutus.* Elytra with four elevated lines: thorax black, with the margins much elevated; last joint of the antennæ reddish.

Lycus minutus. *Gyll.* Lampyris pusilla. *Marsh.*

Inhabits oaks and hedges; is rare in England.

Genus 76. LAMPYRIS *of authors.*

Mandibles pointed at their tips, sharp, and entire: *antennæ* approximate, the joints cylindric and compressed, the third of the same length as the following joints, the second small: *head* concealed by the thorax: *mouth* small: *maxillæ* with a double process: *maxillary palpi* with the last joint triangular-ovate, compressed, the apex acute: *eyes* very large: *body* soft, of the male with elytra and wings; of the female apterous: *thorax* semicircular.

Sp. 1. *Lam. noctiluca.* Common Glow-worm. (*Pl.* 3. *fig.* 1. ♂. *fig.* 2. ♀.

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Genus 77. TELEPHORUS. *Schæff., De Geer, Leach, Oliv., Lam., Latr.* CANTHARIS. *Linn., Fabr., Marsh., Gyll.*

Mandibles with their apex acute and entire: *antennæ* distant: *joints* cylindric, elongate: *maxillæ* bifid: *body* soft: *palpi* with their last joint securiform: *elytra* the length of the abdomen.

Sp. 1. *Tel. fuscus.* Cinereous-black: mouth, base of the antennæ, thorax, back of the abdomen, sides of the belly and anus, red: thorax with a black spot. (*Pl. 3. fig. 4.*)

Cantharis fusca. *Linn., Fabr.* Telephorus fuscus. *Latr.*

Inhabits various plants in the spring and beginning of summer.

Genus 78. MALTHINUS. *Latr., Leach.* CANTHARIS. *Linn., Fabr., Marsh.* TELEPHORUS. *Oliv., De Geer.*

Antennæ distant, joints elongate, cylindric: *maxillæ* bifid: *mandibles* with their points entire and very sharp: *body* soft: *palpi* with their last joint ovate, acute: *elytra* shorter than the abdomen: *head* attenuated behind more or less.

Sp. 1. *Mal. flavus.* Head much attenuated behind: thorax not broader than long, margined all round, the middle longitudinally impressed: body yellowish: antennæ (base excepted), vertex, and dorsal mark of the thorax blackish: elytra with punctured striæ, yellow at their points.

Telephorus minimus. *Oliv.* Malthinus flavus. *Latr.*

Inhabits the oaks of England and France.

Fam. VIII. MELYRIDÆ. *Leach.*

Tarsi with the last joint but one bifid: *mandibles* notched: *maxillæ* bifid: *antennæ* filiform, composed of ten joints: *elytra* soft, flexible: *thorax* quadrate or semicircular.

Genus 79. DASYTES. *Payk., Fabr., Latr., Leach.* MELYRIS. *Olivier, Lam., Illig.* TILLUS. *Marsh.*

Head somewhat transverse, retracted within the thorax, even to the eyes: *tarsi* with nails apparently bifid: *antennæ* with short turbinated joints nearly as broad as long: *lip* with the apex deeply notched, almost bifid: *body* without papillæ.

Sp. 1. *Das. ater.* Oblong, black, widely punctate, hairy, the hairs black and cinereous: head with a double impression in front, which is ovate and roughish.

Dasytes ater. *Latr., Fabr.* Melyris ater. *Olivier.*

Inhabits Europe, amongst grass and moss.

Genus 80. MALACHIUS. *Fabr., Oliv., Lam., Latr., Leach.* CANTHARIS. *Linn., Marsh.* TELEPHORUS. *Schæff., De Geer.*

Head somewhat transverse, retractile even to the eyes within the thorax: *tarsi* with apparently bifid nails: *antennæ* with conic or cylindric-conic joints, longer than broad, in some few pectinated: *labium*

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Z. P. METCALF

with apex entire or scarcely notched: *body* with two papillæ on each side, one under the anterior angle of the thorax, the other at the base of the abdomen.

Sp. 1. *Mal. aneus.* Brassy-green: head anteriorly red-yellowish: elytra blood-red, with the base and half the suture brassy-green. (*Pl.* 3. *fig.* 5.)

Malachius æneus. *Fabr., Latr., Oliv., Gyll., Leach.* Cantharis ænea. *Linn., Marsh.*

Inhabits various plants.

Fam. IX. Tillidæ. *Leach.*

Antennæ thicker at their extremities, serrated in some, solid in others: *elytra* covering the whole abdomen: *body* cylindric: *thorax* narrow behind.

Stirps 1.—*Tarsi* with first joint very distinct, longer than the preceding joint.

Genus 81. TILLUS. *Oliv., Fabr., Marsh., Latr., Leach.* Chrysomela. *Linnæus.* Clerus. *Fabr., Oliv.*

Maxillary palpi filiform: *labial palpi* securiform, nearly completely serrated: *thorax* cylindric or somewhat cordate.

* *Thorax cylindric.*

Sp. 1. *Til. elongatus.* Black, villous: thorax red, black before.

Tillus elongatus. *Fabr., Oliv., Marsh., Latr.* Chrysomela elongata. *Linn.*

Inhabits oaks in June.

T. ambulans of Marsham is a mere variety of this species.

** *Thorax subcordate.*

Sp. 2. *Til. unifasciatus.* Black, pubescent: elytra red at their base, with a white transverse band in the middle.

Clerus unifasciatus. *Fabr., Oliv.* Tillus unifasciatus. *Latr.*

Inhabits England.

Genus 82. THANASIMUS. *Latr., Leach.* Clerus. *Geoff., De Geer, Fabr., Oliv.* Attelabus. *Linn.* Cleroides. *Schæffer.*

Maxillary palpi filiform: *labial palpi* securiform: *antennæ* with their extremities thick and not serrated: *thorax* somewhat cordate.

Sp. 1. *Tha. formicarius.* Black: thorax and base of the elytra red: *elytra* with two transverse bands.

Attelabus formicarius. *Linn.* Clerus formicarius. *Fabr., Oliv., Marsh.*

Inhabits trees in Europe.

Stirps 2.—*Tarsi* with the first joint very short, the upper part concealed by the base of the second articulation.

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Genus 83. OPILUS. *Latr., Leach.* Eupocus. *Illiger.*

Palpi securiform: *antennæ* with the ninth and tenth joints obconic, the last oval, obliquely truncate: *eyes* not notched: *thorax* conic-cylindric, narrower behind.

Sp. 1. *Op. mollis.* Fuscous, villous: base and apex of the elytra and a middle transverse band with the under parts of the thighs yellowish gray. Abdomen red. (*Pl.* 12. *fig.* 1.)

Notoxus mollis. *Fabr.* Clerus mollis. *Oliv., Marsh.* Attelabus mollis. *Linn.* Opilus mollis. *Latr.*

Inhabits Europe, under the bark of trees and in the wood of decayed willows, eating the larvæ of other insects.

Genus 84. NECROBIA. *Latr., Oliv., Leach.* Dermestes. *Linn.* Clerus. *Geoff., De Geer, Marsh.* Corynetes. *Paykull, Fabr.*

Palpi terminated by an obconic joint: *antennæ* with the three last joints forming an oblong triangulate mass, obtuse both externally and internally.

Sp. 1. *Nec. ruficollis.* Blue-black: thorax and base of the elytra red.

Dermestes ruficollis. *Linn.* Corynetes ruficollis. *Fabr.*

Inhabits Europe, feeding on decayed animal substances.

Fam. X. Silphiadæ. *Leach's Zool. Misc.* vol. iii.

Antennæ gradually thickening towards their extremities, or terminated by a solid or perfoliate club: *elytra* covering the greater portion of the abdomen: *body* oval or parallelopiped.

Stirps 1.—*Palpi* very distinct: *mandibles* with their apex entire.

Genus 85. NECROPHAGUS. *Fabr., Oliv., Lam., Leach.* Silpha. *Linn., De Geer, Marsh.* Dermestes. *Geoff.*

Antennæ not much longer than the head, terminated abruptly in a perfoliated knob: *elytra* truncated in a straight line, the external margin not channelled or keeled: *body* long quadrate.

Sp. 1. *Necr. spinipes.* Black: antennæ ferruginous at their points: elytra with their external margin and a double transverse undulated band of orange: trochanters of hinder thighs produced into a spine.

Sp. 2. *Necr. Vespillo.* (*Pl.* 2. *fig.* 6. a. *antennæ magnified.*)

Inhabits putrid *fungi* and dead animals.

Genus 86. NECRODES. *Wilkins's MSS. Leach.*

Body elongate oval: *thorax* orbicular: *apex* of the elytra obliquely truncate: *hinder thighs* of the male thicker than the rest.

Sp. 1. *Necr. littoralis.* Black: antennæ with the three last joints ferruginous: elytra with three elevated lines, the two external ones connected by a tubercle: *hinder tibiæ* of the male arcuate: the thighs toothed.

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Silpha littoralis. *Linn., Fabr., Latr., Oliv., Marsh.*
Inhabits dead bodies, on the banks of rivers or on the shores of the sea.

Genus 87. OICEOPTOMA. *Leach.*
Body oval: *thorax* nearly semicircular, transverse, emarginate before: *antennæ* with the club abrupt, distinct: *elytra* whole (female in general emarginate).

* *Elytra whole in both sexes.*

Sp. 1. *Oic. thoracica.* Black: thorax unequal, ferruginous, somewhat silky: each elytron with three elevated lines.
Silpha thoracica. *Linn., Fabr., Latr., Marsh.*
Inhabits Europe, in dead animals and putrid fungi.

** *Elytra of the female with the apex emarginated.*

Genus THANATOPHILUS. *Leach.*
Sp. 1. *sinuata—Silpha sinuata.* Fabr., &c.

Genus 88. SILPHA. *Linn., Leach, Fabr., Latr., Marsh.*

"* *Elytra with elevated lines.*"

Body oval: *thorax* nearly semicircular, truncate in front: *antennæ* with a gradually formed club.
Sp. 1. *Sil. obscura.* Black, dull above, finely punctate, shining beneath: thorax smoothly punctate, the punctures small and close. Each elytron with three elevated straight lines.
Silpha obscura. *Linn., Latr., Marsh.*
Inhabits Europe. Is very common under stones and on pathways in the spring and summer.
Sp. 2. *Sil. quadrimaculata.* (*Pl. 2. fig. 7. a. antennæ magnified.*)
Inhabits oaks.

"** *Elytra smooth.*"

Sp. 3. *Silpha lævigata.* Fabr.
Inhabits pathways in sandy situations.

Genus 89. PHOSPHUGA. *Leach's Zool. Misc.* vol. iii.
Body oval or nearly rounded: *thorax* semicircular, anterior part truncated: *elytra* whole: *antennæ* with the three last joints abruptly increasing towards their apex.
Sp. 1. *Phos. atrata.* Oval and black: elytra rough and punctured, with three elevated lines.
Inhabits beneath the bark of trees and under moss in winter, sandy situations and pathways in spring.
Sp. 2. *Phos. subrotundata.* Nearly round and black: elytra rough, and punctured with three elevated lines.
Phosphuga subrotundata. *Leach, Zool. Misc.* vol. iii. 75.
Inhabits Ireland, beneath stones; is very rare.

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Stirps 2.—*Palpi* very distinct: *mandibles* notched at their extremities.

Genus 90. SCAPHIDIUM. *Oliv., Payk., Fabr., Latr., Marsh.*

Antennæ, with an abrupt club composed of five somewhat hemispheric joints: *body* acuminated at each extremity: *elytra* truncated: *palpi* filiform: *scutellum* distinct.

Sp. 1. *Sca. quadrimaculatum.* Body black, shining: thorax somewhat coarctate on each side behind: elytra widely punctured, with two blood-red spots on each: tibiæ striated.

Inhabits Germany, France, and England, in *fungi* and rotten wood.

Genus 91. SCAPHISOMA. *Leach.* Scaphidium. *Fabr., Latr. Oliv.*

Antennæ, with a club composed of five somewhat oval joints: *body* acuminated at each extremity: *elytra* truncated: *palpi* filiform: *scutellum* none.

Obs.—The hinder margin of the thorax at the middle is produced into an angle.

Sp. 1. *Sca. agaricinum.* Body black, shining, very smooth; antennæ, apex of the elytra, and feet, pale brown.

Inhabits the *Boletus versicolor* and other *fungi.*

Genus 92. CHOLEVA. *Latr., Spence, Leach.* Catops. *Fabr., Payk., Gyll.* Ptomophagus. *Illiger.* Mordella. *Forster, Marsh.* Helops. *Panz.* Cistela. *Oliv., Fabr.* Luperus. *Frölich.* Dermestes. *Rossi.*

Antennæ straight, with a five-jointed club: *maxillary palpi* with the last joint subulate, conic: *labial palpi* with the last joint obtuse: *thorax* with the hinder angles obtuse.

The species of this genus are numerous, and have afforded the subject of a learned and interesting monograph, by that excellent entomologist, W. Spence, esq. published by the *Linnean Society* in the eleventh volume of their *Transactions.*

Sp. 1. *Cho. oblonga.* Narrow, oblong: thorax narrower behind, the hinder angles obtuse, the middle slightly foveolated: antennæ somewhat filiform.

Cistela angustata. *Fabr.* Choleva oblonga. *Latr., Spence.* Catops elongatus. *Paykull, Gyll.* Ptomophagus rufescens. *Illig.* Mordella picea. *Marsh.* Luperus cisteloides. *Frölich.*

Inhabits moss and under stones.

Genus 93. CATOPS. *Fabr., Payk., Gyll., Panz., Leach.*

Antennæ straight clavate, the club five-jointed: *maxillary palpi* with the last joint subulate, conic; *labial* with the last joint obtuse: *thorax* with the hinder angles acute: *elytra* more or less striated.

Sp. 1. *Cat. sericeus.* Ovate, gibbous-convex, brown-pitch; antennæ and legs pitchy-rust-coloured.

Inhabits moss.

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Genus 94. PTOMOPHAGUS. *Illig., Knoch, Leach.*

Antennæ straight clavated, club five-jointed: *maxillary palpi* with the last joint subulate, conic: *labial* with the last joint obtuse: *thorax* with the hinder angles acute: *elytra* never striated.

Sp. 1. *Ptom. villosus.*

Inhabits dead animals.

Genus 95. MYLÆCHUS. *Latr., Leach.*

Antennæ incurved, shorter than the thorax, the basal joints distinctly thicker than the rest; club five-jointed, the joints transverse: *palpi* of the maxilla with the last joint subulate: *labial palpi* with the last joint obtuse.

Sp. 1. *Myl. brunneus.* Oblong-ovate, black-brown, finely but widely punctate, slightly pubescent.

Catops brevicornis. *Payk.* Mylæchus brunneus. *Latr.* Choleva brunnea. *Spence.*

Inhabits France, Sweden, and England: in the latter country it has occurred but twice.

Genus 96. CRYPTOPHAGUS. *Herbst, Payk., Gyll., Leach.*

Body depressed; *back* plain: *tarsi* with elongate slender joints: *antennæ* with a compact three-jointed club.

Sp. 1. *Crypt. cellaris.* Testaceous ferrugineous, widely punctate, pubescent: thorax finely denticulated, on each side distinctly unidentate, anterior angles dilated, rounded, ending behind in an obsolete tooth.

Ips cellaris. *Oliv., Latr.* Dermestes cellaris. *Scopoli.* Cryptophagus cellaris. *Payk., Gyll., Leach.* Cryptophagus crenatus. *Herbst.* Dermestes Fungorum. *Panzer.*

Inhabits damp wood, paper, &c. in cellars.

Genus 97. ENGIS. *Payk., Fabr., Gyll., Leach.*

Body depressed, back plain: *antennæ* with a three-jointed much perfoliated club: *tarsi* with the three first joints short.

Sp. 1. *Engis humeralis.* Elliptic, black, shining, punctate; antennæ, head, thorax, humeral spot on the elytra and feet red approaching to blood red.

Engis humeralis. *Payk., Fabr., Gyll.* Ips humeralis. *Herbst.* Dacne humeralis. *Latr.*

Inhabits Europe, under the bark of trees and in *boleti.*

Genus 98. THYMALUS. *Latr., Leach.* PELTIS. *Kugellan, Illiger, Payk., Fabr.* OSTOMA. *Laicharting.*

Body depressed; back plain: *tarsi* with the third joint neither bifid nor dilated: *palpi* terminated by a thick joint: *mandibles* prominent: *antennæ* with a three-jointed club.

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Sp. 1. *Thym. ferrugineus.*
Inhabits beneath the bark of trees.

Genus 99. NITIDULA. *Linn., Fabr., Payk., Olivier, Marsh., Leach.*

Mandibles prominent: *body* short, depressed; back plain: *thorax* generally broad: *antennæ* with the third joint twice as long as the second; club abrupt and orbicular, composed of three joints.

Sp. 1. *Nit. bipustulata.* Body elliptic, brown, blackish: thorax emarginate; elytra with a red spot on each.
Nitidula bipustulata. *Linn., Latr., Fabr., Marsh.*
Sp. 2. *Nit. discoidea.* (*Pl. 2. fig. 5. a. antennæ magnified.*)
Nit. discoidea. *Marsh.*
Inhabits dead carcases, dried bones, *boleti*, and under the bark of trees.

Genus 100. IPS. *Fabr., Herbst, Gyll., Leach.* NITIDULA. *Latr.*

Mandibles prominent, strong, and much bent at their points: *body* elongate-quadrate; back plain: *thorax* transverse-quadrate: *antennæ* with the third joint twice as long as the second; club abrupt and orbicular, composed of three joints.

Sp. 1. *Ips quadripustulatus.*
Inhabits the decayed stumps of trees under the bark.

Genus 101. BITURUS. *Latr., Leach.* IPS. *Olivier.* DERMESTES. *Geoff., De Geer, Fabr.*

Antennæ with the third joint not twice as long as the following joint; club composed of three joints: *mandibles* prominent: *body* oval or oblong; back plain: *thorax* broad behind, with the angles pointed: *elytra* covering the abdomen.

Sp. 1. *Bit. tomentosus.* Antennæ shorter than the thorax: thorax short, the posterior angles broadly depressed, reflected; body oval, black, with a reddish-yellow down; antennæ and feet yellow red.
Inhabits the white-thorn and umbelliferous plants in May and June.

Genus 102. CATERETES. *Herbst, Latr., Leach.* BRACHYPTERUS. *Kugellan.* DERMESTES. *Linn., Fabr.* STRONGYLUS. *Herbst.* NITIDULA. *Oliv.* CERCUS. *Latr.*

Antennæ with the third and following joint scarcely differing in length; club compressed, perfoliate, obconic, composed of three joints; *thorax* rounded, without angles behind: *elytra* very short: *body* depressed, back plain: *mandibles* prominent.

Sp. 1. *Cat. rufilabris.* Black, shining, with gray down.
Cercus rufilabris. *Latr.*
Inhabits *junci* near Hull.

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STIRPS 3.—*Labial palpi* scarcely distinct: *antennæ* placed in an excavation of the thorax: *mandibles* with their apex arcuate and acute.

Genus 103. MICROPEPLUS. *Latr., Leach.*

Antennæ with the club composed of but one joint: *maxillary palpi* with the last joint subulate.

Sp. 1 *Micr. porcatus.* Black; elytra cancellated.
Staphylinus porcatus. *Paykull.*
Inhabits sandy ground.

Fam. XI. STAPHYLINIDÆ.

Antennæ gradually thickening towards their extremities, or terminated by a perfoliated mass: *elytra* covering about half the abdomen, or less, but very rarely more: *body* long, and more or less narrow.

Gravenhorst has written an admirable monograph on this family, entitled *Monographia Coleopterorum Micropterorum.*

This is a very extensive family; several hundred species are found in this country. They inhabit fungi in all its states; dung, roots of grass, flowers, under the bark of trees; and may be found in immense numbers in sand pits, and in the dung of animals, from which they may be driven by immersing the dung in water in the spring and summer months; by this means many hundred specimens may be obtained in a single day: the smaller species should be placed on a piece of gummed paper, with the legs and antennæ carefully extended to show their characters. It is necessary to collect great numbers of them, as they demand a very minute examination, which, in many instances, requires the aid of a microscope, the characters being so very obscure.

Division I.—*Anterior margin of the head (bearing the mandibles) immediately behind the eyes, terminated by a transverse straight line, (or with a line slightly bent in the middle,) not rounded or crooked at their sides. Antennæ inserted below the middle part of the abovementioned line. Thorax long. Neck distinct. Body very long and narrow. Elytra covering a very small portion of the abdomen.*

Genus 104. STAPHYLINUS. *Linn., Fabr., Latr., Oliv., Lam., Gravenh., Leach.*

Palpi filiform: *antennæ* towards their extremities distinctly thicker, moniliform, the last joint obliquely truncate or emarginate: *lip* deeply emarginate.

Sp. 1. *Staph. erythropterus.* Black; the greater part of the antennæ, elytra, and feet red; hinder margins of the head and thorax, the

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breast, and a double series of spots on each side of the abdomen, golden-yellow tomentose. (*Pl. 4. fig. 10.*)

Inhabits Europe in dung, and under stones.

Obs.—Several new genera have been formed from this genus, of which the following species may be considered as the types:

Genus Creophilus. *Kirby.*
Staph. maxillosus *of authors.*

Genus Velleius. *Leach.*
Staph. dilatatus. *Paykull.*
Staph. concolor. *Marsham.*

Genus Emus. *Leach.*
Staph. hirtus *of authors.*

Genus Staphylinus.
Staph. erythropterus.

Genus Ocypus. *Kirby.*
Staph. cyaneus.

Genus Gyrohypnus. *Kirby.*
Staph. fulgidus.

To my kind and valuable friend Dr. Leach I am indebted for the above and following notice of new genera, as lately established by the celebrated entomologists whose names are affixed.

Genus 105. LATHROBIUM. *Gravenhorst, Latr., Leach.* Pæderus. *Gravenh., Fabr., Oliv.* Staphylinus. *Linn., Geoff.*

Palpi subulate, with the last joint acicular and minute: *antennæ* nearly filiform, joints nearly conic, those towards the extremities more rounded, and somewhat globose: *lip* deeply notched, nearly bilobate.

Sp. 1. *Lath. elongatum.* Pubescent, minutely but widely punctated, black, shining; with the mouth, antennæ, apex of the elytra, and feet, red-brown: head ovate: antennæ about the length of the thorax, with the outermost joints nearly globose: thorax elongate-quadrate, with obtuse angles, the breasts equal, the middle dorsal line smooth.

Lathrobium elongatum. *Gravenh., Latr., Leach.* Staphylinus elongatus. *Linn.* Pæderus elongatus. *Fabr.*

Inhabits putrid vegetables, and under stones.

Obs.—*Lathrobium depressum* may be considered as the type of the Genus Achenium of *Leach.*

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Division II.—*Anterior margin of the head circumscribed by a curved line, the antennæ inserted on this side of the level of the line. Elytra covering half the abdomen or more. Thorax generally longer than broad, or with equal diameters.*

Subdivision 1.—*Maxillary palpi longer than the labial one, with their extremities thickest; the last joint obscure. Body linear. Head with a distinct neck. Thorax orbicular or cylindric.*

Genus 106. PÆDERUS. *Fabr., Oliv., Latr., Payk., Lam., Gravenh., Leach.* STAPHYLINUS. *Linn., Geoff., De Geer.*

Antennæ inserted before the eyes, insensibly thickening towards their extremities; the third joint very long: *eyes* moderately large.

Sp. 1. *Pæd. riparius.* Body red, shining: head, antennæ (four basal joints excepted), apex of the abdomen, and knees, black: elytra blue, with white impressed dots. (*Pl. 4. fig. 12.*)

Pæderus riparius. *Fabr., Latr., Oliv., Gravenh.* Staphylinus riparius. *Linn.*

Inhabits banks and under stones.

OBS.—*Pæderus orbiculatus* is the type of the Genus RUGILUS of *Leach.*

Genus 107. STENUS. *Latr., Cuv., Lam., Fabr., Payk., Gravenh., Leach.*

Antennæ inserted at the exterior margin of the eyes, abruptly thicker at their extremities, the inferior joints cylindric, the outer ones conic globose: *eyes* nearly globose, large.

* *Tongue long, anus without setæ.*

Sp. 1. *Stenus biguttatus.* Black, with gray down, minutely punctate, somewhat rugulose: vertex of the head with an elevated line: thorax behind with an impressed little line; each elytron with a reddish round spot. (*Pl. 4. fig. 13.*)

Staphylinus guttatus. *Linn., Marsh.* Stenus biguttatus. *Fabr., Payk., Gravenh., Latr.*

** *Tongue obsolete. Anus with two setæ.*

Genus DIANOUS. *Leach.*

Sp. 2. *Stenus cærulescens.* Gyllenhall.

Subdivision 2.—*Maxillary palpi not much longer than the labial, not thicker at their extremities; the last joint distinct.*

A. *Mandibles strong, with their external edge with one or more teeth. Head free.*

a. The second, third, and fourth joints of the tarsi very short; the last joint as long as the others united.

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Genus 108. OXYPORUS. *Fabr., Oliv., Lam., Leach, Grav., Latr.*

Antennæ scarcely longer than the head, terminated by a perfoliated mass: *maxillary palpi* filiform; the *labial ones* terminated by a very large lunate joint: *thorax* semicircular: *head* broader than the thorax.

Sp. 1. *Oxy. rufus.* Red; suture and apex of the elytra, anus and breast, black. (*Pl. 4. fig. 11.*)

Oxyporus rufus. *Fabr., Latr., Gravenh., Oliv.* Staphylinus rufus. *Linn.*

Inhabits *boleti* and other fungi.

Genus 109. OXYTELUS. *Grav., Latr., Leach.*

Antennæ somewhat broken, incurved, thicker externally, with the last joints foliate above; the extreme joint globose ovate; the basal joint very long conic: *palpi* subulate: *anterior tibiæ* very spiny, with their extremities notched or narrowed externally, with their *tarsi* capable of being reflected from their sides.

Sp. 1. *Oxy. carinatus.* Black, shining, distinctly and widely impresso-punctate; front unequal, somewhat inclined to be rugulose; the anterior space between the eyes rather smooth: thorax impressed on each side; the middle with three grooves, and four carinæ; the two middle ones joining together: feet blackish: tibiæ with very short little spines.

Oxytelus carinatus. *Grav., Latr.*

Inhabits dung.

Obs.—The following genera have lately been formed from this genus:

Genus Oxytelus. *Latr.*
Palpi acuminate.
Sp. 1. Oxy. carinatus: 2. Oxy. rugosus.

Genus Bledius. *Leach.*
Sp. 1. Oxy. armatus. *Panz.*

Genus Carpelimus. *Kirby.*
Palpi capitate.

Genus Eristhetus. *Knoch.*
Palpi with their last joint ovate.
Erist. scaber. *Knoch.*

Taken on an old oak near Plymouth by Dr. Leach.

Genus 110. OMALIUM. *Grav., Latr., Leach.* Staphylinus. *Geoff., Fabr., Oliv.*

Palpi filiform: *antennæ* thicker towards their extremities, the last joints rounded, somewhat perfoliate: *thorax* transverse-quadrate, the anterior angles rounded.

Sp. 1. *Omal. rivulare.* Blackish, punctate; base of the antennæ and

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feet pale brown: head with two impressions between the eyes: thorax marginated, impressed at the hinder angles; back with two grooves: elytra twice as long as the thorax, obscure brown.

Omalium rivulare. *Gravenh.*, *Latr.* Staphylinus rivularis. *Payk.*

Inhabits dunghills.

Obs.—The following species may be considered as types of as many genera:

Genus Elonium. *Leach.*
Omalium striatum.

Genus Omalium. *Gravenhorst.*
Omal. depressum.

Genus Anthobium. *Leach.*
Omal. melanocephalum.

b. Tarsi with elongate joints, the last joint shorter than the others united.

Genus 111. LESTIVA. *Latr.* Anthophagus. *Graven.*, *Leach.* Staphylinus. *Fabr.*, *Payk.*, *Oliv.* Carabus. *Panz.*, *Marsh.*

Antennæ nearly filiform, the second and third following joints obconic: *palpi* filiform: *thorax* elongate, somewhat cordiform, narrow, and truncate behind.

Sp. 1. *Lest. punctulata.* Black, fuscous, somewhat smooth, minutely and finely punctate: antennæ and feet obscure rufous.

Carabus dimidiatus. *Panz.* Carabus staphylinoides. *Marsh.* Lestiva punctulata. *Latr.*

Inhabits France and England; in the latter it is rare.

Genus 112. PROTEINUS. *Latr.*, *Leach.*

Antennæ evidently thicker towards their extremities: *palpi* subulate: *thorax* transverse.

Sp. 1. *Prot. brachypterus.* Depressed, flat, black, shining, smooth, silky above; mandibles, basal joint of the antennæ, and feet, brown red: head a little narrower than the thorax, triangular: thorax short, smooth, anteriorly a little narrower, the sides somewhat rounded, very slightly margined, the hinder margin twice as broad as long, the angles slightly prominent and somewhat reddish: scutellum very small: elytra elongate-quadrate, externally marginate, the hinder and external margins rounded: abdomen with the four last joints naked.

Proteinus brachypterus. *Latr.*

Inhabits France and England.

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B. *Mandibles without denticulations on their internal edge. Head inserted into the thorax more or less.*

a. Antennæ wide apart, inserted before the eyes; the fifth and following joints longer than broad: tibiæ spinose.

Genus 113. TACHINUS. *Grav., Latr., Leach.* Oxyporus. *Fabr.* Staphylinus. *Linn., Geoff., Oliv., Payk.*

Palpi filiform.

Sp. 1. *Tach. rufipes.* Black, shining, smooth: antennæ fuscous: elytra and feet generally brown; external apex of the elytra paler.

Staphylinus rufipes. *Paykull.* Tachinus rufipes. *Grav., Latr.* Oxyporus rufipes. *Fabricius?*

Inhabits the dung of oxen and horses.

Obs.—The following may be considered as types of the

Genus Tachynus. *Grav.*
Sp. 1. Tach. subterraneus.

Genus Bolitobius. *Leach.*
Tach. analis.

Genus 114. TACHYPORUS. *Grav., Latr., Leach.* Staphylinus. *Linn., Oliv., Geoff., Marsh.* Oxyporus. *Fabr.*

Palpi subulate.

Sp. 1. *Tach. chrysomelinus.* Black, shining, smooth: thorax, elytra (base excepted), and feet, red yellow: thorax somewhat transverse: abdomen with the extremity truncate.

Tachyporus chrysomelinus. *Grav., Latr., Leach.* Oxyporus chrysomelinus. *Fabr.* Staphylinus chrysomelinus. *Linn., Marsh.*

Inhabits flowers, the roots of grass and moss.

b. Antennæ more or less approximate, inserted at the anterior internal margin of the eye, fifth and following joints broader than long: tibiæ not spiny.

Obs.—Tachyporus Granum. *Gravenh.* is the type of the Genus Cypha. *Kirby.*

Genus 115. ALEOCHARA. *Knoch, Gravenh., Latr., Leach.* Staphylinus. *Linn., Fabr., Geoff., De Geer, Oliv., Marsh.*

Head with the hinder part received into the thorax.

Sp. 1. *Aleo. canaliculata.* Red fuscous, feet paler: head and the two last joints (save one of the abdomen), black: elytra together transverse-quadrate; back of the thorax excavated with an impressed longitudinal line in the middle.

Aleochara canaliculata. *Grav., Latr.* Staphylinus canaliculatus. *Fabr.*

Inhabits sandy banks and under stones.

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Obs.—Of this genus the following species may be considered as types of the undermentioned genera:

Genus Aleochara. *Grav.*
Sp. 1. Aleo. fuscipes.

Genus Drusilla. *Leach.*
Sp. 1. Aleo. canaliculata.

Genus Falagria. *Leach.*
Sp. 1. Aleo. sulcata.

Genus Autalia. *Leach.*
Sp. 1. Aleo. impressa. 2. Aleo. rivularis.

Genus 116. LOMECHUSA. *Grav., Latr., Leach.*

Head disengaged from the thorax behind, with an inconspicuous neck or none: *thorax* transverse, the sides rounded: *antennæ* distinctly perfoliated.

Sp. 1. *Lom. emarginata.* Brown-reddish rather opaque, minutely punctulated: elytra pale, testaceous; hinder angles of the thorax and elytra terminating in spinous points.
Lom. emarginata. *Grav.*
Inhabits dry sand spots under stones.

Obs.—Genus Dinarda. *Leach.*
The type of this genus is Lomechusa dentata. *Grav.*

Fam. XII. Pselaphidæ. *Leach.*

Dimera. *Latreille.*
Elytra abbreviated: *tarsi* with three articulations: *claws* monodactyle.

"Latreille supposed that these animals had but two joints to their tarsi, and therefore placed them in a peculiar section of the Coleoptera; observing, however, that they are allied to *Aleochara*, to whose family they are even referred by Kirby."

Dr. Leach considers them as constituting a distinct family, whose situation is intermediate between the *Staphylinidæ* and *Scydmænidæ*, to both of which they are intimately allied; but may be distinguished from either by the structure of their claws, and from the latter also by their abbreviated elytra.

In the third volume of the *Zoological Miscellany* is given an excellent monograph of the genera of this family, in which are enumerated nineteen British species, five of which are new, and none of them were known to Mr. Marsham, who has not described one species in his *Entomologia Britannica.*

1. *Antennæ with eleven joints. Maxillary palpi elongated.*

Stirps 1.—*Body* elongated and depressed.

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Genus 117. EUPLECTUS. *Kirby, MSS. Leach, Zool. Misc.* vol. iii.

Antennæ with the first and second joint thick: *maxillary palpi* with the last joint conical.

Sp. 1. *Eup. Reichenbachii.* Leach.

Inhabits ————————. Taken in Norfolk by Mr. J. Curtis.

STIRPS 2.—Body short and convex.

A. *Maxillary palpi with the last joint securiform.*

Genus 118. BYTHINUS. *Leach.* PSELAPHUS, *Family* II. *Reichenbach.*

Antennæ with the first joint round and considerably larger than the second, which is but a little increased, of the male internally acutely produced; the third and succeeding to the eighth joint round and of an equal size, ninth and tenth larger, eleventh oval, the last acute: *maxillary palpi* with the first articulation filiform, increasing towards the apex; second oval, third securiform, the base with a large angle.

Sp. 1. *Byth. Curtisii.*

Inhabits sand-pits.

Genus 119. ARCOPAGUS. *Leach.*

Antennæ with the first and second joint increasing; the first elongated, the second round; the third and following to the eighth nearly globose; ninth increasing, nearly globose and lenticular; the tenth larger; the eleventh and remainder increasing, oval, the apex of the last joint acuminated: *maxillary palpi* with the first joint filiform, gradually increasing to a club; the second elongate-oval; the third oval securiform, base angular.

* *Antennæ with the first joint cylindrical.*

Sp. 1. *Arc. glabricollis.* Leach. *Pselaphus grabricollis.* Reich.

Inhabits woods, under moss.

** *Antennæ with the first joint internally dilated.*

Sp. 2. *Arc. bulbifer.* Leach. *Pselaphus bulbifer.* Reich.

Inhabits —— Norfolk. Messrs. Sims and Jos. Hooker.

Genus 120. TYCHUS. *Leach.*

Antennæ with the first and second joint enlarged and nearly round, the first a little more lengthened and thicker than the second; third and following to the eighth nearly globose; third and fourth a little longer than the fifth, which is somewhat larger; ninth and tenth globose, increasing, and lenticular, the tenth larger than the ninth; the eleventh with the others gradually increasing.

Sp. 1. *Tych. niger.*

Inhabits ——? Taken near London and Bristol, as well as in the vicinity of Norwich.

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B. *Maxillary palpi with the last joint clavate.*

Genus 121. BRYAXIS, *Knoch, Leach.* PSELAPHUS, *Fam.* III. A. *Reich.*

Antennæ with the first and second joint enlarged and nearly cylindrical; third and following to the seventh nearly cylindrical; the fifth the longest, eighth small and subglobose, ninth and following gradually increasing: *maxillary palpi* with the first joint clavated, narrow at the base; second nearly globose; third conical.

* *Foveolæ of the thorax connected by a furrow. Antennæ with the apex of the last joint acute, third and four following joints, elongated.*

Sp. 1. *Bry. longicornis.* Leach, Zool. Misc. iii. 85.
Inhabits the roots of grass on the sloping banks Battersea fields.

** *Thorax with the furrow very conspicuous. Antennæ with the last joint nearly obtuse; the third and following to the seventh, short. (Ninth subglobose; tenth lenticulated.)*

Sp. 2. *Bry. impressa.*
Ps. impressus. *Reich., Monog. Ps. t. 2. f. 15.*
Inhabits ——— Norfolk.

C. *Maxillary palpi with the last joint clavated.*

Genus 122. PSELAPHUS. *Herbst, Latr., Leach, &c.* PSELAPHUS, *Fam.* I. *Reichenbach.*

Antennæ with the first and second joint elongated and nearly cylindrical; third and following to the eighth nearly globular and equal; ninth and tenth increasing, nearly equal and globular; eleventh and remainder gradually increasing: *maxillary palpi* with the first joint filiform, the apex almost abruptly clavated; second nearly globose; third with the apex gradually clavated.

Sp. 1. *Psel. Herbstii.* (*Pl. 4. fig. 15.*) magnified: the line beneath shows the natural size.
Inhabits banks and river sides.

OBS.—The *Pselaphi* are obtained by seeking at the roots of grass, in sand-pits, &c. but being so exceedingly minute they easily escape the eye of the entomologist unless he looks very close to the ground; the usual practice is either to sit or lie down, and by this means many highly interesting and rare insects may be taken whilst the entomologist rests from a more laborious mode of collecting.

Fam. XIII. SCYDMÆNIDÆ. *Leach.*

PALPATORES. *Latreille.*

Body ovoid, rounded at each extremity: *palpi* very long: *tarsi* short: *elytra* hard, covering the abdomen: *antennæ* gradually thicker towards their extremities.

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Genus 123. SCYDMÆNUS. *Illig., Paykull, Leach.* ANTHICUS. *Fabr.*

Antennæ gradually thickening towards their extremities: *maxillary palpi* terminated by an acicular obscure joint.

Sp. 1. *Scyd. Hellwigii.* Last joint of the maxillary palpi obsolete; three last joints of the antennæ forming a club: thorax ovate: body fuscous-red-brown, pubescent: head, thorax, and abdomen darker: elytra smooth.

Pselaphus Hellwigii. *Herbst, Payk., Illig., Leach.* Anthicus Hellwigii, *Fabr.* Scydmænus Hellwigii. *Latr.*

Fam. XIV. PTINIDÆ. *Leach.*

PTINIORES. *Latreille.*

Antennæ much longer than the head, filiform, or terminated by three large joints not united into a mass.

STIRPS 1.—*Antennæ* uniform, not terminated by three joints, larger than the rest.

Genus 124. PTINUS. *Linn., Fabr., Latr., Lam., Oliv., Leach.* BRUCHUS. *Geoff.*

Antennæ simple filiform, approximate, inserted between the eyes: *eyes* projecting: *thorax* hood-like: *abdomen* nearly oval: *elytra* united in the male.

Sp. 1. *Ptin. Fur.* Red-fuscous: thorax with four tubercles transversely striated, the two middle ones highest, with tufts of hair, contracted and margined behind: abdomen ovate, rounded at the base: elytra villose, with two yellow-gray bands; the second joint of the antennæ shorter than the third: under part of the body with short gray-yellow hairs.

Ptinus Fur. *Linn., Fabr., Latr., Oliv., Leach.*

Inhabits houses, and commits great devastation in museums.

OBS.—*Ptinus testaceus* of Marsham is merely the male of this species.

Genus 125. GIBBIUM. *Latr., Leach.*

Antennæ simple, setaceous, inserted behind the eyes: *eyes* not prominent: *thorax* simple: *abdomen* nearly globular: *elytra* united in both sexes.

Sp. 1. *Gib. Scotias.* Latr., Leach.

Inhabits houses. It has been three times taken in Bristol.

OBS.—Ptinus sulcatus, *Marsham*, forms the type of the genus MEZIUM, *Leach's MSS.*, and is akin to GIBBIUM.

Genus 126. PTILINUS. *Geoff., Oliv., Lam., Fabr., Latr., Leach.* ANOBIUM. *Illiger.* SERROCERUS. *Kugellan.* PTINUS. *Linn., Marsh.*

Antennæ inserted before the eyes, very much pectinated in the males, serrated in the females: *body* long-ovoid, nearly cylindric: *thorax* somewhat globose.

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Sp. 1. *Pti. pectinicornis.* Body blackish: elytra obscure brown: antennæ and feet reddish: thorax rough: elytra punctate.
Ptilinus pectinicornis. *Fabr., Oliv., Latr., Leach.* Ptinus pectinicornis. *Linn., Marsh.* Dermestes pectinicornis. *Linn.?*
Inhabits old trees and houses, perforating them to destruction.

Obs.—*Ptinus serraticornis*, Marsham, is the female of this insect.

Stirps 2.—*Antennæ* terminated by three joints differing from the rest in size.

Genus 127. ANOBIUM. *Fabr., Oliv., Lamarck, Latr., Leach.* Ptinus. *Linn., De Geer, Marsh.* Bruchus. *Geoff.*
Antennæ eleven-jointed, with the three last joints abruptly thicker than the others; the ninth and tenth joints obconic; the tenth oval.

* *Elytra not striated.*

Sp. 1. *Anob. tessellatum.* Thorax bilobate behind, the lateral margins reflexed: body fuscous, sprinkled with villose, obscure luteous spots: elytra not striated
Anobium tessellatum. *Fabr., Latr., Leach.* Ptinus tessellatus. *Marsh.*
Inhabits the wood of rotten trees, especially willows, during the winter months.

** *Elytra striated.*

Sp. 3. *Anob. striatum.* Fuscous, with grayish down: thorax with a gibbous protuberance, unisulcate above, with the angles compressed: hinder margins somewhat marginated: elytra longitudinally punctate.
Anobium striatum. *Latr., Oliv., Illig., Leach.* Anobium pertinax. *Fabr., Payk.*
Inhabits rotten trees.

Fam. XV. Dermestidæ. *Leach.*

Dermestini. *Latreille.*
Antennæ slender, longer than the head, and terminated by a large ovoid mass.

Stirps 1.—*Sternum* not produced to the mouth, or over it like a neckcloth: *tibiæ* spinose.

Genus 128. DERMESTES. *Linn., Fabr., Latr., Marsh., Herbst, Oliv., Leach.*
Antennæ with an ovate club, the last joint short, not (or but little) longer than the preceding joint: *body* narrow oval: *thorax* with the hinder margin straight or obtusely lobed: *palpi* very short: *maxillary palpi* shorter than the maxillæ, or scarcely as long.
Sp. 1. *Der. lardarius.* Black: base of the elytra with a cinereous band with black points.
Dermestes lardarius. *Linn., Fabr. Latr., Marsh., Leach.*
Inhabits decayed animal substances, paper, &c. is common in houses.

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Genus 129. ATTAGENUS. *Latr., Leach.* Megatoma. *Herbst.* Dermestes. *Fabr., Linn., Latr., Marsh.*

Antennæ with an elongate-ovate club, the last joint longer than the preceding (especially in the male), triangular or conic: *body* broad-oval: *thorax* with the posterior margin narrowly and acutely lobed: *maxillary palpi* exserted, longer than the maxillæ; the last joint elongate-cylindric, very long in some.

Sp. 1. *Att. Pellio.* Black; middle of the antennæ and of the tarsi obscure red: hinder margin of the thorax with three spots, and the elytra with a spot on each side of the suture villose-white: antennæ of the male with the last joint ensiform, very long.

Dermestes Pellio. *Linn., Fabr., Marsh., Latr.* Megatoma nigra. *Herbst.* (variety of the male.)

Inhabits skins in houses, old wood, and paper.

Stirps 2.—*Sternum* produced over the mouth like a neckcloth: *tibiæ* not or but slightly spined.

Genus 130. MEGATOMA. *Herbst., Latr., Leach.* Dermestes. *Linn., De Geer, Fabr.*

Body narrow-oval: *antennæ* with an oval or oblong club with the internal edge simple.

Sp. 1. *Meg. undatum.* Black; sides of the thorax and two undulated bands on the elytra white villose: *tarsi* obscure red.

Megatoma undulata. *Herbst.* Megatoma undatum. *Latr.* Dermestes undatus. *Linn., Fabr., Oliv., Panz.*

Inhabits birch trees (beneath the bark) in the months of March and April: the larva spins a silken web in which it changes to a pupa.

Fam. XVI. Byrrhidæ. *Leach.*

Byrrhi. *Latreille.*

Body ovoid: *feet* entirely or semicontractile: *sternum* anteriorly produced to a mouth in the form of a neckcloth: *antennæ* thicker towards their extremities: *tarsi* with five very distinct articulations: *antennæ* straight, not inserted in the cavity of the eyes: *feet* perfectly contractile: *mandibles* but little or not at all prominent.

Genus 131. ANTHRENUS. *Geoff., Fabr., Oliv., Lam., Latr., Leach.* Byrrhus. *Linn., Marsh.* Dermestes. *De Geer.*

Antennæ shorter than the thorax with the club solid: *palpi* filiform, short: *body* orbiculate-ovate: *scutellum* very minute.

Sp. 1. *Anth. Scrophulariæ.* Black: sides of the thorax and three transverse bands on the elytra gray: suture and external margin of the elytra and hinder margin of the thorax red lutescent.

Anthrenus Scrophulariæ. *Fabr., Latr., Leach.* Byrrhus Scrophulariæ. *Linn., Marsh.*

Inhabits the blossoms of various plants.

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Genus 132. THROSCUS. *Latr., Leach.* ELATER. *Linn., Oliv., Geoff.* DERMESTES. *Fabr., Payk., Illiger.*

Antennæ as long as the thorax, with the three last joints large, forming an oval club: *palpi* short, with the last joint securiform: *body* elliptic, narrow, depressed.

Sp. 1. *Thr. dermestoides.* Brown, with gray-yellowish down: elytra with punctated striæ.

Elater dermestoides. *Linn., Oliv.* Dermestes adstrictor. *Payk., Illig., Fabr.* Throscus dermestoides. *Latr., Leach.*

Inhabits European plants; is very rare in Britain.

Genus 133. BYRRHUS. *Linn., Fabr., Oliv., Lam., Latr., Illiger, Gyll., Leach.* CISTELA. *Geoff., Marsh.* DERMESTES. *De Geer.*

Antennæ a little shorter than the thorax, with the four or five terminal joints gradually thicker, compressed: *palpi* short, the last joint longest, thick, somewhat ovate: *body* smewhat ovate, very convex above: *scutellum* minute.

Sp. 1. *Byr. Pilula.*

Inhabits pathways and sandy situations.

Fam. XVII. HISTERIDÆ. *Leach.*

Genus HISTER. *Linn., Fabr., Latr., Marsh., &c.* HISTEROIDES. *Gyll., Payk.*

Antennæ geniculated, terminated by a nearly solid club of three articulations: *elytra* shorter than the abdomen, the margin of the sides inflexed: *tarsi* with five joints; contractile.

The insects of this Family are numerous: their habitation is the dung of animals, and some are found in rotten wood. A valuable paper has been published in the third volume of the *Zoological Miscellany*, from which the following is selected.

STIRPS 1.—*Body* thick, nearly globose or quadrate: *tibiæ* elongated and straight: *tarsi* long and slender: *sternum* simple.

Genus 134. ABRÆUS. *Leach's Zool. Misc.* vol. iii.

Antennæ with the first articulation somewhat elongated, second and third nearly cylindrical, straight: fourth short; fifth, sixth, and seventh, nearly globose and equal; eighth nearly globose, lenticular; ninth, tenth, and eleventh forming a short oval club.

Sp. 1. *Abr. perpusillus.*

Hister perpusillus. *Marsh.*

Inhabits the dung of animals.

Genus 135. ONTHOPHILUS. *Leach's Zool. Misc.* vol. iii.

Antennæ with the first joint long, the second cylindrical, closely joined at the base; third obconic; fourth and fifth short and obconic; sixth and seventh shorter and nearly globose; eighth nearly lenticular; ninth, tenth, and eleventh forming an oval club.

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Sp. 1. *Onth. striatus.* Payk., Monogr. Hist. 100. *t.* 11. *f.* 1.
Inhabits dung.

Stirps 2.—*Body* depressed: *tibiæ* broad: *tarsi* short: *sternum* dilated, the fore part forming a cavity for the head, which is capable of being retracted even to the mandibles.

A. *Tibiæ, the four posterior with two series of spines.*

Genus 136. HISTER *of authors.*

Body above nearly convex: *thorax* with the anterior part straight.

a. Elytra with the outer striæ extending their whole length.

a. Thorax with the sides striated, the striæ extending their whole length.

* *Elytra with marginal striæ.*

Sp. 1. *Hist. unicolor* of authors.
Inhabits dung.

** *Elytra without the marginal striæ.*

Sp. 2. *Hist. sinuatus.* Illiger. 4-*maculatus.* Marsh.

b. Thorax with the sides not striated.

* *Elytra with no marginal striæ.*

Sp. 3. *Hist. parvus.* Marsh., Leach.

** *Elytra with a marginal stria.*

Sp. 1. *Hist. purpurascens.* Fabr., Leach. *Hist. bipustulatus.* Marsh.

b. Elytra with the external striæ abbreviated.

Sp. 1. *Hist. nitidulus.* (*Pl.* 2. *fig.* 1. a. *antennæ magnified.*) Fabr., Leach, —*Hist. semipunctatus.* Marsh.

B. *Four posterior tibiæ with only one row of spines.*

Genus 137. DENDROPHILUS. *Leach's Zool. Misc.* vol. iii.

Body with the upper part nearly convex: *thorax* short, the anterior part straight.

Sp. 1. *Den. punctatus.*
Hister punctatus. *Ent. Heft.*

Genus 138. PLATYSOMA. *Leach.*

Body with the upper part plain: *thorax* transverse or nearly equall quadrate.

* *Elytra without striæ. Body finely punctured.*

Sp. 1. *Plat. picipes.* Leach. *H. piscipes.* Fabr.

** *Elytra without external striæ. Body not punctured.*

Sp. 2. *Plat. flavicornis.* Leach. *H. flavicornis.* Herbst.

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**** Elytra externally striated. Body without punctures.*

Sp. 3. *Plat. depressum.* Leach. *H. depressus.* Marsh.

Subdivision 3.—*Antennæ straight, not inserted in the cavity of the eyes. Feet semicontractile.*

Genus 139. LIMNIUS. *Müller, Gyll., Leach.* DYTISCUS. *Panz.* CHRYSOMELA. *Marsh.* ELMIS. *Latr.*

Antennæ nearly filiform, the last joint largest, somewhat oval.

Sp. 1. *Lim. Volckmari.* Leach.
Dytiscus Volckmari. *Panzer.*
Chrysomela buprestoides. *Marsh.*

Fam. XVIII. PARNIDÆ. *Leach.*

Antennæ inserted in the anterior canthus of the eye: *elytra* not shorter than the abdomen.

Genus 140. PARNUS. *Fabr., Illig., Marsh., Leach.* DERMESTES. *Geoff.* ELATER. *Rossi.* DRYOPS. *Oliv., Lam., Latr.*

Antennæ composed of three joints, the last joint articulated: *tarsi* with five joints.

OBS.—The insects of this genus inhabit the roots and blades of grass at the sides of ponds and ditches; the method of finding them is to loosen the grass in those places, by which means the insects will be found floating on the water: we have several species in this country that have not yet been clearly defined, but have been confounded with *prolifericornis.*

Sp. 1. *Par. sericeus.* Leach's MSS. (*Pl.* 3. *fig.* 10. a. *antennæ magnified.*)

Genus 141. HETEROCERUS. *Bosc., Fabr., Illig., Latr., Marsh., Leach.*

Antennæ composed of eleven joints, the seven last forming a dentate or serrated mass: *tarsi* with four joints.

Sp. 1. *Het. marginatus.* Blackish villose; sides of the thorax and abdomen with spots on the elytra, margins of the abdomen, and feet pale luteous. (*Pl.* 3. *fig.* 11.)

Inhabits marshy places, burrowing in the muddy and clayey banks of ponds.

Fam. XIX. HELOPHORIDÆ. *Leach.*

Mandibles without teeth at their extremities: *body* oblong: *antennæ* terminated by a club.

STIRPS 1.—*Clypeus* whole: *maxillary palpi* with the last joint thick and oval.

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Genus 142. HELOPHORUS. *Leach.* ELOPHORUS. *Fabr., Oliv., Latr., Gyll.*

Eyes sessile: *thorax* transverse.

* *Thorax and elytra furrowed.*

Sp. 1. *Hel. stagnalis.* Hydrophilus stagnalis. *Marsh.*
Inhabits ponds, floating on the surface and walking on aquatic plants.

** *Thorax and elytra with elevated lines.*

Sp. 1. *Hel. nubilus.* Gyll.

Genus 143. HYDROCHUS. *Germar., Leach.* ELOPHORUS. *Fabr., Illig., &c.*

Eyes rather prominent: *thorax* elongated.

Sp. 1. *Hydr. cicindeloides.* Hydrophilus cicindeloides. *Marsh.*
Inhabits ponds, and may frequently be found in the mud at the sides.

STIRPS 2.—*Clypeus* entire.

Genus 144. OCHTHEBIUS. *Leach's Edinb. Encycl.—Zool. Misc.* vol. iii. ELOPHORUS. *Fabr.* HYDRÆNA. *Latr., Illig.*

Maxillary palpi with the middle and last joint slender and acute.

Sp. 1. *Och. riparius.* Leach. Hydrophilus impressus. *Marsh.*

Genus 145. HYDRÆNA. *Kugellan, Leach.*

Maxillary palpi with the last joint long and acuminated.

Sp. 1. *Hyd. Kugellani.* Leach. Hydro. longipalpus. *Marsh.*

Fam. XX. HYDROPHILIDÆ.

Mandibles at their points bidentate: *body* oval or round: *antennæ* terminated by a club.

STIRPS 1.—*Clypeus* emarginate: *sternum* simple: *antennæ* with six articulations.

Genus 146. SPERCHEUS. *Fabr., Latr., Leach.*

Sp. 1. *Sper. sordidus.* Spercheus sordidus. *Fabr.* Hydr. sordidus. *Marsh.*
Inhabits stagnant waters.

STIRPS 2.—*Clypeus* whole: *sternum* simple.

A. *Elytra with the apex whole. Scutellum small.*

Genus 147. BEROSUS. *Leach's Zool. Misc.* vol. iii.

Body narrow before: *thorax* convex: *eyes* rather prominent.
Sp. 1. *Ber. luridus* of authors.
Inhabits ponds.

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Genus 148. HYDROBIUS. *Leach.*

Body oval, convex, obtuse: *eyes* simple.

* *Elytra striated.*

Sp. 1. *Hydr. fuscipes.*
Inhabits ponds.

** *Elytra smooth.*

Sp. 1. *Hydr. melanocephalus.*
Inhabits ponds.

B. *Elytra with the apex truncated. Scutellum small.*

Genus 149. LIMNEBIUS. *Leach.*

Body rather depressed: *eyes* simple.

Sp. 1. *Lim. nitidus.* Hydrophilus nitidus. *Marsh.*
Inhabits ponds and ditches.

STIRPS 3.—*Clypeus* whole: *sternum* produced into a spine.

Genus 150. HYDRÖUS. *Linné's MSS., Leach.*

Scutellum large: *anterior tarsi* of the male dilated in the middle with unequal claws: *antennæ* with their last joint acuminated.
Sp. 1. *Hydr. piceus* of authors.
Inhabits ponds and ditches.

Genus 151. HYDROPHILUS *of authors.*

Body with the posterior part slightly obtuse: *antennæ* with the last joint obtuse: *scutellum* moderate: *anterior tarsi* in both sexes simple.
Sp. 1 *Hydr. caraboides* of authors. (*Pl.* 3. *fig.* 16.)
Inhabits ponds; is very common.

Fam. XXI. SPHÆRIDIADÆ. *Leach.*

Antennæ terminated by a club: *maxillary palpi* very long: *mentum* large, clypeiform: *head* with the front rounded, cowl-shaped: *feet* formed for walking: *tarsi* with the basal joint as long or longer than the second joint (in the male with the last joint on the anterior tarsi large). The insects of this family are very nearly akin to the *Hydrolophii.*

Genus 152. SPHÆRIDIUM. *Fabr., Oliv., Lamarck, Leach.* DERMESTES. *Linn., De Geer, Marsh.*

Body somewhat hæmispheric: *eyes* immersed: *thorax* transverse: *tibiæ* spinose, armed with heels: *sternum* behind produced into a conic spine.
Sp. 1. *Sph. scarabæoides.* Black, shining, smooth: scutellum forming a long triangle: feet very spiny: each elytron at the base with a blood-

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red spot, and a livid reddish spot at the apex. (*Pl.* 3. *fig.* 12. a. *antennæ magnified.*)

Sphæridium scarabæoides. *Fabr.*, *Latr.* Dermestes scarabæoides. *Marsh.*, *Linn.*

Inhabits dung.

Genus 153. CERCYON. *Leach's Zool. Misc.* vol. iii. Dermestes. *Marsh.*

Antennæ with the club imbricated (*Pl.* 3. *fig.* 12. b. *magnified*): *anterior tarsi* in both sexes simple.

Sp. 1. *Cer. unipunctatum.*

Inhabits dung.

Sp. 2. *Cer. melanocephalum.*

Inhabits dung and flowers.

Fam. XXII. Copridæ. *Leach.*

Coprophagi I. *Latreille.*

Labial palpi very hairy, the last joint smaller than the preceding: *scutellum* none or very obscure: *elytra* taken together not longer than broad: *posterior feet* situated near the anus: *antennæ* eight- or nine-jointed, terminated by an abrupt lamellated mass: *anterior tibiæ* large and dentated: *mentum* not very large: *mandibles* membranaceous: *maxillæ* membranaceous: *clypeus* semicircular.

Subdivision 1.—*Labial palpi, with the last joint very distinct. Thorax much shorter than the elytra; much broader than long. Anterior tibiæ long, arcuate.*

Genus 154. COPRIS. *Geoff.*, *Illig.*, *Fabr.*, *Lam.*, *Latr.*, *Leach.* Scarabæus. *Linn.*, *De Geer.*, *Oliv.*, *Marsh.*

Scutellum none: *abdomen* elevated, convex: *anterior tibiæ* longer than the others; externally with three strong teeth terminated by a tarsus: *antennæ* nine-jointed.

Sp. 1. *Cop. lunaris.*

Copris lunaris. *Fabr.*, *Latr.*, *Leach.* Scarabæus lunaris. *Linn.*, *Marsh.* *Scarabæus emarginatus* of Marsham is merely the female.

Inhabits dung in sandy situations and lanes, entering the earth two or three inches beneath the surface.

Subdivision 2.—*Labial palpi with the last joint not distinct. Thorax longer than the elytra. Tibiæ all terminated by a tarsus.*

Genus 155. ONTHOPHAGUS. *Latr.* Copris. *Geoff.*, *Illiger*, *Fabr.* Scarabæus. *Linn.*, *Herbst.*, *Oliv.*, *Marsh.*

Sp. 1. *Onth. Vacca.*

Inhabits dung: this and many others are very abundant under dung in April and May.

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Fam. XXIII. APHODIADÆ. *Leach.*

COPROPHAGI II. *Latreille.*

Labial palpi nearly smooth, filiform, the joints nearly equal, cylindric: *feet* all separated by equal distances; hinder ones distant from the anus: *scutellum* distinct.

Genus 156. APHODIUS. *Illiger, Fabr., Latr., Leach.* SCARABÆUS. *Oliv., Marsh., Linn.*

Sp. 1. *Aph. rufipes.*

Inhabits dung in the spring of the year.

This genus may be divided, for the sake of convenience, from the clypeus.

1. *Clypeus smooth, emarginate.*
2. *Clypeus smooth, entire.*
3. *Clypeus tuberculate.*

Fam. XXIV. GEOTRUPIDÆ. *Leach.*

GEOTRUPINI. *Latreille.*

Antennæ eleven-jointed, terminated by a lamellated club: *anterior tibiæ* large, dentate: *mentum* not large: *mandibles* corneous, porrect; *labrum* prominent: *clypeus* rhomboidal.

Genus 157. GEOTRUPES. *Latr., Dumeril, Lam., Leach.* SCARABÆUS. *Linn., Geoff., Fabr., Oliv., De Geer.*

Antennæ terminated by an oval lamellated club: *thorax* shorter than the abdomen, not horned: *hinder feet* distant from the anus: *head* not produced behind the eyes: *scutellum* obvious.

Sp. 1. *Geo. stercorarius.*

Inhabits Europe; boring cylindric holes beneath the dung, and flying about in the dusk of the evening.

Genus 158. TYPHÆUS. *Leach.* SCARABÆUS. *Fabr., Gyll., Marsh.*

Antennæ terminated by an oval lamellated club: *thorax* shorter than the abdomen; on each side in front with a long process which extends along the sides of the head: *hinder feet* distant from the anus: *head* not produced behind the eyes: *scutellum* obvious.

Sp. 1. *Typ. vulgaris.* (*Pl.* 1. *fig.* 1.)

Scarabæus typhæus. *Fabr., Gyll., Marsh.*

Inhabits the dung of horses on heaths, in the spring of the year.

OBS.—Scarabæus mobilicornis, *Marsh.*, forms the genus ODONTEUS, *Köppe.*

Fam. XXV. MELOLONTHIDÆ. *Leach.* SCARABÆIDES. *Latr.*

Antennæ ten-jointed (in some nine), terminated by a lamellated club: *mandibles* corneous in part: *clypeus* triangular or quadrate: *anterior tibiæ* large and dentate: *mentum* not large.

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Stirps 1.—No scale between the posterior angles of the thorax and the exterior base of the elytra.

Division I.—*Thorax almost quadrate, more or less transverse. Mandibles entirely corneous.*

Subdivision 1.—*Labrum prominent even beyond the clypeus. Maxillæ interiorly armed with a horny hook, simple or bifid. Body nearly globular or ovoid. Elytra tumid, embracing the sides of the abdomen.*

Genus 159.—ÆGIALIA. *Latr., Leach.* Aphodius. *Panz., Illig.* Psammodius. *Gyll.*

Antennæ distinctly longer than the head, composed of nine joints, the first of which is cylindric and a little hairy: *body* nearly globular: *wings* none.

Sp. 1. *Ægi. globosa.* Black, shining: head granulated: elytra striated, impunctate.

Aphodius globosus. *Illig.* Psammodius globosus. *Gyllenhall.* Ægialia globosa. *Latr., Leach.*

Inhabits the sandy shores of the sea.

Genus 160. PSAMMODIUS. *Gyll., Leach.*

Body elongate, convex: *antennæ* distinctly longer than the head: *wings* two: *thorax* transversely striated.

Sp. 1. *Psam. Sulcicollis.* Gyll.

Aphodius Sulcicollis. *Illig.*

Inhabits sandy places. Taken at Swansea by Mr. W. S. Millard, a most assiduous and successful collector of British insects.

Genus 161. TROX. *Fabr., Oliv., Lam., Latr., Leach.* Scarabæus. *Linn., Marsh., Geoff., De Geer.*

Antennæ scarcely longer than the head, composed of ten joints, the first obconic and very hairy: *body* ovoid: *maxillæ* with a simple hook.

Sp. 1. *Trox sabulosus.*

Inhabits sandy places.

Subdivision 2.—*Labrum not projecting beyond the clypeus. Body not globose. Elytra not embracing the sides of the abdomen.*

* *Body subcylindric.*

Genus 162. SINODENDRON. *Fabr., Latr., Don., Leach.* Scarabæus. *Linn., De Geer., Oliv.* Lucanus. *Marsh.*

Antennæ with a lamellated club not capable of being folded: the *lamellæ* very short, resembling the teeth of a saw: *body* cylindric: *maxillæ* coriaceous, bilobate.

Sp. 1. *Sin. cylindricum.* Black, shining, impressed-punctate, cicatriculose; the punctures umbilicated, the umbilici perforate. (Male with a conic-compressed horn, the female with a short horn on the head.)

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Sinodendron cylindricum. *Fabr., Latr., Don., Leach.* Scarabæus cylindricus. *Linn., De Geer, Oliv.* Lucanus cylindricus. *Marsh.*
Inhabits old trees, especially the ash. Is very abundant near Cheltenham and near Plymouth.

** *Body ovoid-oblong.*

Genus 163. MELOLONTHA. *Fabr., Oliv., Lam., Latr., Leach.*

Elytra with their external edge not sinuated, very slightly narrower at their base than at their points: *tibiæ* armed with very distinct heels.
Sp. 1. *Mel. vulgaris.* (Common Cockchaffer.)
Melolontha vulgaris. *Latr., Fabr.* Scarabæus melolontha. *Linn., Marsh.*
Inhabits various trees in May and June.

Genus 164. ANOMALA. *Köppe, Leach's MSS.*

Elytra with the external edge not sinuated, very slightly narrower at their base than at their points: *tibiæ* terminated by very distinct heels: *antennæ* of both sexes nearly equal in size, with a lamellated club: *body* ovate or short ovate convex.
A. Frischii. Mel. Frischii. *Fabr.*
Inhabits the sandy coasts of the sea.

The following may be considered as the type of the Genus AMALOPLIA, Sp. 1. Melolon. ruricola.

Genus 165. HOPLIA. *Illig., Latr., Leach.* SCARABÆUS. *Linn., Geoff., De Geer.* MELOLONTHA. *Fabr., Oliv.*

Elytra with their external edge sinuated: *tibiæ* with very obscure spurs or heels.
Sp. 1. *Hopl. pulverulenta.*
Inhabits heaths.

Division II.—*Thorax as long as broad, nearly orbicular, or almost ovoid and truncate at their extremities. Mandibles partly membranaceous, sometimes entirely corneous. Maxillæ terminated by a membranaceous or coriaceous lobe. Labrum not prominent.*

Genus 166. TRICHIUS. *Fabr., Latr., Leach.*

Antennæ with the first joint very large: *clypeus* quadrate: *palpi* short, with their first joint very large: *clypeus* quadrate: *tarsi* with equal nails.
Sp. 1. *Tr. fasciatus.*
Trichius fasciatus. *Latr., Fabr., Leach.* Cetonia fasciata. *Oliv.* Scarabæus fasciatus. *Linn.*
Inhabits Europe on umbelliferous plants, but is rare in Britain.
Sp. 2. *Tr. nobilis.* (*Pl.* 1. *fig.* 2. a. *antennæ magnified.*)

STIRPS 2.—A triangular scale interposed between the posterior angles of the thorax, and the exterior of the base of the elytra.

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Genus 167. CETONIA. *Fabr., Latr., Oliv., Lamarck, Leach.* Scarabæus. *Linn., Geoff., De Geer, Marsh.*

Maxillæ almost membranaceous, or coriaceous: *mentum* of a moderate size: *thorax* triangular, with the anterior point truncate: *elytra* abruptly sinuated at their internal side towards the base.

Sp. 1. *Cet. aurata.*

Inhabits the flowers of roses, the larvæ live in decayed wood.

Fam. XXVI. Lucanidæ. *Leach.*

Lucanides. *Latreille.*

Antennæ with a pectinated club: *anterior tibiæ* large and dentated: *palpi* four: *labrum* generally wanting: *mandibles* very strong, corneous, dentated, exserted: *mentum* corneous.

Genus 168. LUCANUS *of authors.* Platycerus. *Geoff.*

Palpi long: *lip* bifid, very hairy, the *laciniæ* resembling pencils.

Sp. 1. *Luc. Cervus.* (Stag Beetle.) (*Pl.* 1. *fig.* 3.)

Section II. *HETEROMERA.*

Four anterior *tarsi* five-jointed, hinder pair four-jointed: *antennæ* eleven-jointed, never lamellated or furnished with a pectinated head.

Fam. XXVII. Blapsidæ. *Leach.*

Mentum small, or moderately large, quadrate or orbicular: *palpi* terminated by a thick joint; the last joint of the maxillary one securiform.

Genus 169. BLAPS. *Fabr., Oliv., Lam., Latr., Marsh., Leach.* Tenebrio. *Linn., Geoff.*

Back flat: *thorax* almost quadrate: *antennæ* with the third joint much longer than the fourth: *elytra* with their extremities pointed.

Sp. 1. *Blaps mortisaga.*

Inhabits dark cellars and damp places.

Fam. XXVIII. Tenebrionidæ. *Leach.*

Mandibles bifid at their extremities: *head* more or less triangular, without a contraction behind, at its junction with the thorax: *tarsi* with entire joints: *antennæ* moniliform, not perfoliated or serrated: *maxillæ* unguiculated.

Genus 170. PEDINUS. *Latr., Leach.* Tenebrio. *Linn., Geoff., Marsh.* Blaps. *Fabr., Herbst.* Helops. *Olivier.* Opatrum. *Illig.*

Body oval: *maxillary palpi* terminated by a thick joint: *antennæ* filiform; the last joint globose or turbinated.

Sp. 1. *Ped. maritimus.* Leach. (*Pl.* 4. *fig.* 2.) ♂ Tenebrio femoralis. *Marsh.* ♀ T. gemellatus. *Marsh.*

Inhabits sandy places: is very abundant on the sea shore near Swansea, South Wales.

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Genus 171. OPATRUM. *Fabr.*, *Oliv.*, *Lam.*, *Leach.* Silpha. *Linn.* Tenebrio. *Geoff.*, *Marsh.*

Body oval: *maxillary palpi* with their last joint obtrigonate: *antennæ* gradually thicker towards their extremities: the last joints transverse, compressed.

Sp. 1. *Opat. sabulosum.* (*Pl. 2. fig. 8. a. antennæ magnified.*)

Opatrum sabulosum. *Fabr.*, *Latr.* Silpha sabulosa. *Linn.* Tenebrio sabulosus. *Marsh.*

Inhabits sandy places.

Genus 172. TENEBRIO. *Linn.*, *Geoff.*, *De Geer*, *Fabr.*, *Latr.*, *Leach.*

Thorax behind as broad as the elytra: *body* elongate: *antennæ* scarcely gradually thicker towards their extremities; the eighth, ninth, and tenth joints transverse; the last subglobose: *mentum* somewhat quadrate; the upper margin rounded: *maxillary palpi* with their last joint thick.

Sp. 1. *Ten. Molitor.* (*Pl. 4. fig. 1.*)

Inhabits houses; the larvæ in meal and flour; and is well known under the name of meal-worm.

Fam. XXIX. Diaperidæ. *Leach.*

Mandibles bifid at their extremities: *head* more or less triangular, without a contraction behind, at its juncture with the thorax: *tarsi* with entire joints: *antennæ* not moniliform, their extremities perfoliated or serrated.

Stirps 1.—*Body* linear, or nearly so. *Thorax* almost quadrate. *Antennæ* terminated by a club. *Maxillæ* unguiculated.

Genus 173. SARROTRIUM. *Illig.*, *Fabr.*, *Leach.* Hispa. *Linn.*, *Marsh.* Tenebrio. *De Geer.* Orthocerus. *Latr.*

Antennæ with the last six joints forming a thick, fusiform, downy mass.

Sp. 1. *Sarr. muticum.* (*Pl. 2. fig. 16. a. antennæ magnified.*)

Sarrotrium muticum. *Payk.*, *Fabr.*, *Leach.* Hispa mutica. *Linn.*, *Marsh.* Orthocerus hirticornis. *Latr.*

Inhabits sandy places. In Britain it is rare, or at least very local. It has been found in gravel-pits near Norwich by Mr. Joseph Hooker, and near Hampstead by Mr. Stephens, in the months of June and July.

Stirps. 2.—*Antennæ* not moniliform. *Body* oval, or nearly orbicular: a little longer than broad.

a. *Antennæ not serrated at their extremities.*

Genus 174. PHALERIA. *Latr.*, *Leach.* Tenebrio. *Fabr.*

Anterior tibiæ elongate-trigonate: *tarsi* short: *antennæ* gradually thickening towards their extremities, where they are perfoliated: *body* oval.

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Sp. 1. *Phal. cadaverina.*
Tenebrio cadaverina. *Fabr.*
Inhabits sandy places.

Genus 175. DIAPERIS. *Geoff., Fabr., Oliv., Lam., Leach.* CHRYSOMELA. *Linn., Marsh.* TENEBRIO. *De Geer.*
Antennæ gradually enlarging towards their extremities, from the fourth joint perfoliated: *body* nearly hemispheric, very convex above.
Sp. 1. *Dia. Boleti* of authors.
Chrysomela Boleti. *Linn., Marsh.*
Inhabits the *boleti* of trees: is rare.

Genus 176. TETRATOMA. *Herbst, Fabr., Payk., Leach.*
Antennæ terminated by a club of four joints, the other joints very small: *body* oval: *tibiæ* not spiny.
Sp. 1. *Tetr. Fungorum.*
Inhabits *fungi.*

Genus 177. LEIOIDES. *Latr., Leach.* ANISOTOMA. *Illig., Fabr.* SPHÆRIDIUM. *Olivier.* TETRATOMA. *Herbst.*
Antennæ abruptly terminated by a five-jointed club, the eighth joint (the second of the club) very small: *thorax* almost hemispheric: *tibiæ* spinose.
Sp. 1. *Lei. picea.*
Anisotoma piceum. *Illig.* Anisotoma picea. *Panz.* Leoides picea. *Latr.*
Inhabits sandy places in Europe.

b. *Antennæ terminated by joints, resembling in their form the teeth of a saw.*

Genus 178. BOLILOPHAGUS. *Illig., Fabr.* ELEDONA. *Latr., Leach.* OPATRUM. *Oliv., Marsh.* DIAPERIS. *Oliv.*
Palpi filiform; *maxillary* ones with their last joint almost cylindric: *antennæ* arcuate: *body* oval, convex, generally rough: *thorax* transverse, emarginate before; the sides often with acute margins.
Sp. 1. *Boli. Agaricola.*
Bolilophagus Agaricola. *Illig., Fabr.* Eledona Agaricola. *Latr., Leach.* Opatrum Agaricola. *Oliv., Marsh.*
Inhabits *boleti* and other *fungi.*

STIRPS 3.—*Antennæ* nearly or quite filiform, with their extremities simple.

a. *Mandibles with their extremities bifid.*

Genus 179. HELOPS. *Fabr., Oliv., Lam., Illig., Latr., Rossi, Leach.* TENEBRIO. *Linn.*
Maxillary palpi terminated by a securiform joint: *antennæ* as long or longer than the thorax: *thorax* quadrate or semicircular: *body* convex.
Sp. *Hel. lanipes.*

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Helops lanipes. *Fabr., Latr., Oliv.* Tenebrio lanipes. *Linn.*
Inhabits Europe under the bark of trees.

b. *Mandibles with their points entire. Tarsi with denticulated nails.*

Genus 180. CISTELA. *Fabr., Latr., Lam., Oliv., Leach.* CHRYSOMELA. *Linn.* MORDELLA. *Geoff.*

Body ovate: *antennæ* serrated: *feet* rather long.

Sp. 1. *Cist. ceramboides.*
Cistela ceramboides. *Fabr., Latr., Oliv.* Chrysomela ceramboides, *Linn.*
Sp. 2. *Cist. sulphurea.* (*Pl. 4. fig. 6.*)
Crioceris sulphurea. *Marsh.* 219. 1.

Fam. XXX. MELYANDRYADÆ. *Leach.*

Mandibles bifid at their extremities: *head* more or less triangular, without a contraction behind, at its juncture with the thorax: *four anterior tarsi* with the last joint but one bilobate: *maxillary palpi* with the last joint large, securiform, or obtrigonate.

STIRPS 1.—*Hinder tarsi* with entire joints.

Genus 181. SERROPALPUS. *Oliv., Payk., Illig., Latr., Leach.* DIRCÆA. *Fabr.*

Antennæ filiform: *body* almost cylindric, and very long.

An insect of this genus has lately been taken in this country, and was first discovered in Windsor Forest. In July 1817, being in Hampshire in company with my friend Mr. John Chant, we took four specimens from a rotten oak near Lyndhurst.

Genus 182. ORCHESIA. *Latr.* DIRCÆA. *Fabr., Leach.* HALLOMEMUS. *Illig., Payk., Hellwig.* MEGATOMA. *Herbst.* MORDELLA. *Marsh.*

Hinder feet formed for leaping: *antennæ* clavate: *body* elliptic.

Sp. 1. *Orc. micans.* Fabr.
Hallomenus micans. *Paykull.* Serropalpus micans. *Illiger.* Megatoma picea. *Herbst.* Mordella Boleti. *Marsh.* Orchesia micans. *Latr., Leach.*
Inhabits *boleti.*

STIRPS 2.—*Tarsi* altogether with their last joint but one bilobate.

Genus 183. MELANDRYA. *Fabr., Latr., Leach.* CHRYSOMELA. *Linn.* SERROPALPUS. *Illig., Bosc.*

Antennæ simple, filiform: *maxillary palpi* terminated by an elongate securiform joint: *body* nearly elliptic; *thorax* trapezoid, broad behind.

Sp. 1. *Mel. caraboides.*
Chrysomela caraboides. *Linn.* Serropalpus caraboides. *Oliv., Illig.* Melandra serrata. *Fabr., Latr.* Crioceris caraboides. *Marsh.*
Inhabits rotten trees.

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Genus 184. LAGRIA. *Fabr., Oliv., Lam., Leach.* CHRYSOMELA. *Linn.* CANTHARIS. *Geoff.* TENEBRIO. *De Geer.*

Antennæ simple, growing insensibly thicker towards their extremity: *maxillary palpi* double the size of the labial, with the last joint large, securiform; *labial palpi* with the last joint ovate: *body* oblong (generally villose).

Sp. 1. *Lag. hirta.*

Lagria hirta. *Fabr., Latr.* Chrysomela hirta. *Linn.* Auchenia hirta. *Marsh.*

Inhabits the white-thorn in May and June.

Fam. XXXI. PYROCHROIDÆ. *Leach.*

PYROCHOIDES. *Latreille.*

Head cordiform, abruptly strangulated at its junction with the thorax: *tarsi* with their penultimate joints all bilobate: *body* elongate, depressed, or convex and cylindric: *thorax* almost cordate.

STIRPS 1.—*Antennæ* pectinated, serrated, or branched.

Genus 185. PYROCHROA. *Fabr., Geoff., De Geer, Oliv., Latr., Leach.* CANTHARIS. *Linné.*

Antennæ pectinated or serrated: *thorax* orbicular.

The prevailing colour in this genus is red and black.

Sp. 1. *Pyr. rubens.* Fabr., Latr., Oliv.

Inhabits white-thorn hedges in May and June.

Sp. 2. *Pyr. coccinea.* (*Pl. 3. fig. 3.*)

Inhabits the woods of Kent.

STIRPS 2.—*Antennæ* simple.

Genus 186. SCRAPTIA. *Latr., Leach.*

Labial palpi terminated by a semilunar, or large triangular joint: *thorax* almost semicircular.

Sp. 1. *Scr. fusca.*

Scraptia fusca. *Latr., Leach.*

Inhabits *boleti.*

Genus 187. NOTOXUS. *Geoff., Oliv., Illig., Latr., Leach.* MELÖE. *Linn., Donovan.* ANTHICUS. *Payk., Fabr.*

Labial palpi terminated by a small truncate joint: *thorax* almost cordiform, produced into a porrected horn in front: *antennæ* simple.

Sp. 1. *Not. monoceros.* (*Pl. 2. fig. 23. a. antennæ, head, and thorax magnified.*)

Melöe monoceros. *Linné, Don.* Notoxus monoceros. *Oliv., Illig., Latr.* Anthicus monoceros. *Fabr., Payk.*

Inhabits sandy situations; and has been taken in profusion on the sandy sea shores of Swansea.

Genus 188. ANTHICUS. *Payk., Fabr., Leach.* NOTOXUS. *Illig., Latr.* LYTTA. *Marsh.*

Labial palpi terminated by a small truncate joint: *thorax* almost cordiform, not anteriorly produced.

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Sp. 1. *Anth. fusca.*
Lytta fusca. *Marsh.*
Inhabits dung in the neighbourhood of stables.

Fam. XXXII. MORDELLADÆ. *Leach.*

MORDELLANÆ. *Latreille.*
Head cordiform, abruptly strangulated at its junction with the thorax: *hinder tarsi* (sometimes the others) with their penultimate joint entire: *body* elevated, arcuate, laterally compressed, and terminated by a point: *head* very large: *elytra* very short, or very narrow and pointed behind: *hinder feet* large: *tibiæ* with spurs.

Genus 189. RHIPIPHORUS. *Bosc, Fabr., Payk., Oliv., Lam., Leach.* MORDELLA. *Marsh., Linné.*

Tarsi with all the joints simple: *palpi* almost filiform: *antennæ* pectinated or flabellate: *scutellum* none, or concealed.
Sp. 1. *Rhip. paradoxus.*
Mordella paradoxa. *Linn.* Rhipiphorus paradoxus. *Latr., Leach.*
Inhabits Europe. In Britain it is extremely rare. The larvæ inhabit the nests of *Vespa Crabro* (the hornet). *Mordella paradoxa* of Marsham, which is distinct from the Linnean species, has been found in the nest of a wasp.

Genus 190. MORDELLA. *Linn., Geoff., Fabr., Latr., Marsh., Leach.*

Tarsi with all their joints simple: *maxillary palpi* terminated by a securiform joint: *antennæ* simple, or very slightly serrated: *scutellum* distinct.
Sp. 1. *Mord. aculeata.*
Mordella aculeata. *Linn., Fabr., Latr., Oliv., Marsh., Leach.*
Inhabits the blossoms of the crab-tree, white-thorn, &c.
Sp. 2. *Mord. fasciata.* (*Pl.* 4. *fig.* 8.)

Genus 191. ANASPIS. *Latr., Geoff., Leach.* MORDELLA. *Linn., Fabr., Oliv., Marsh.*

Penultimate joint of the four *anterior tarsi* bilobate: *maxillary palpi* with the last joint securiform: *scutellum* none.
Sp. 1. *Anas. frontalis.*
Mordella frontalis. *Fabr., Oliv., Payk., Marsh.* Anaspis frontalis. *Latr., Leach.*
Inhabits flowers, especially those of the umbellate plants.

Fam. XXXIII. CANTHARIDÆ. *Leach.*

CANTHARIDÆ. *Latreille.*
Head large, cordiform: *neck* distinct: *mandibles* not notched at their points: *thorax* almost quadrate, or cordiform: *elytra* flexible: *tarsi* generally with entire joints.

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Stirps 1.—*Antennæ* of equal thickness, tapering towards their points, or subclavate, longer than the thorax, composed of globular or obconic joints: *elytra* covering only a part of the abdomen; short, oval, diverging at the suture: *wings* none: *tarsi* with all their joints entire.

Genus 192. MELÖE *of authors.*

Abdomen very large, generally soft: *antennæ* various.

Obs.—Dr. Leach has written an excellent monograph on this genus, which will be found in the eleventh volume of the *Transactions of the Linnean Society*, and is illustrated by highly finished figures of the species by that celebrated artist and excellent naturalist Mr. Sowerby. An enumeration of the species and habitats will be found in the calendar.

Stirps 2.—*Antennæ* composed of cylindric or obconic joints, longer than the thorax.

Genus 193. CANTHARIS. *Geoffroy, De Geer, Oliv., Lam., Latr., Leach.* Melöe. *Linn.* Lytta. *Fabr., Marsh.*

Elytra soft, elongate, linear, with the sides somewhat inflexed, the back convex, rounded: *maxillæ* with two membranaceous laciniæ, the external one acute within, subuncinate: *antennæ* with the first joint larger than the others; the second very short, transverse; the rest obconic, the last ovoid.

Sp. 1. *Canth. vesicatoria*, (Spanish fly.) (*Pl. 4. fig. 5.*)

Melöe vesicatorius. *Linn.* Cantharis vesicatoria. *De Geer, Geoff., Oliv., Latr.* Lytta vesicatoria. *Marsh., Fabr.*

Inhabits Europe: is found on the ash, but is rare in England: it is the common blister-fly of the shops.

Fam. XXXIV. Œdemiradæ. *Leach.*

Œdemerites. *Latreille.*

Antennæ filiform or setaceous: *rostrum* not very flat, and dilated at its extremity: *head* produced into a kind of rostrum.

Genus 194. ŒDEMERA. *Latr., Oliv., Leach.* Necydalis. *Linn., Fabr.* Cantharis. *Marsh.*

Antennæ inserted at the anterior internal margin of the eyes: *rostrum* not elongate: *eyes* prominent: *elytra* tubulate: *palpi* with the last joint broader than the penultimate joint.

Sp. 1. *Œdem. cærulea.*

Necydalis cœrulea. *Linn., Fabr.* Œdemera cœrulea. *Latr., Oliv., Leach.*

Inhabits Europe on the flowers of umbelliferous plants.

Genus 195. MYCTERUS. *Clairv., Oliv., Leach.* Rhinomacer. *Fabr., Latr.* Mylabris. *Schæffer.*

Antennæ inserted before the eyes on the rostrum: *rostrum* elongate,

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narrow: *eyes* globose, prominent: *elytra* hard: *palpi* with the last joint compressed.

Sp. 1. *Myc. curculionides.*

Rhinomacer curculionides. *Fabr., Latr.* Mycterus griseus. *Clairv.* Mycterus curculionides. *Leach.*

Inhabits Europe: has been taken in South Devon by the late Mr. John Cranch, of Kingsbridge, zoologist in the late unfortunate expedition to the Congo. For a most interesting biographical account of this indefatigable naturalist, see *Capt. Tuckey's Narrative*, and *Journal of Arts*, No. IX.

Fam. XXXV. SALPINGIDÆ. *Leach.*

Antennæ thicker at their extremities: *rostrum* very flat, and dilated at its extremity: *head* produced into a rostrum.

Genus 196. SALPINGUS. *Illiger, Leach.* CURCULIO. *Linn., De Geer, Marsh.* ANTHRIBUS. *Fabr., Payk., Panz., Clairv.* RHINOSIMUS. *Latr.*

Antennæ inserted before the eyes: *elytra* rigid.

Sp. 1. *Sal. Roboris.*

Rhinosimus Roboris. *Latr.* Curculio ruficollis. *Marsh.* Salpingus Roboris. *Leach.*

Inhabits Europe under the bark of trees.

Section III. *TETRAMERA.*

Tarsi with four joints.

Division I.—*Head anteriorly rostrated; the mouth at the apex of the rostrum.*

Fam. XXXVI. BRUCHIDÆ. *Leach.*

BRUCHELÆ. *Latreille.*

Palpi obvious, filiform, not very minute: *rostrum* broad: *labrum* exserted: *antennæ* eleven-jointed, subclavate, with the club formed of distinct joints, in some; filiform, or gradually thicker towards their points, in others; serrated or pectinated.

Genus 197. PLATYRHINUS. *Clairville, Leach.* ANTHRIBUS. *Fabr., Geoff., Payk., Latr.* MACROCEPHALUS. *Oliv.*

Antennæ clavate, the club elongate: *eyes* not emarginate: *elytra* covering the anus above: *body* ovate, oblong: *abdomen* somewhat elongate-quadrate.

Sp. 1. *Pl. latirostris.*

Anthribus latirostris. *Fabr., Latr., Payk.* Platyrhinus latirostris. *Clairv., Leach.* Macrocephalus latirostris. *Oliv.*

Inhabits *boleti* in woods: is rare in Britain.

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Genus 198. ANTHRIBUS. *Paykull, Fabr., Latr., Geoff., Leach.* MACROCEPHALUS. *Oliv.*

Antennæ clavate: *the club* ovate, abrupt, incrassated: *eyes* not emarginate: *elytra* covering the anus above: *body* short, oval, thick: *thorax* transverse, broader behind, lobated: *rostrum* short.

Sp. 1. *An. scabrosus.*

Anthribus scabrosus. *Payk., Fabr., Latr., Leach.* Bruchus scabrosus. *Marsh.* Macrocephalus scabrosus. *Olivier.*

Inhabits the elm and horse-chesnut.

Genus 199. RHINOMACER. *Oliv., Fabr., Leach.* ANTHRIBUS. *Payk., Latr., Leach.*

Antennæ clavate: *eyes* not emarginate: *elytra* covering the anus above; *abdomen* elongate, narrow: *thorax* roundish, nearly equally broad: *rostrum* at the base much narrower than the head, the longitudinal diameter many times exceeding the breadth: *tarsi* with the second joint not including the third.

Sp. 1. *Rhi. attelaboides.*

Anthribus rhinomacer. *Payk., Latr.* Rhinomacer attelaboides. *Fabr., Leach.*

Inhabits pine-trees.

Genus 200. BRUCHUS. *Linn., De Geer, Oliv., Fabr., Latr., Marsh., Leach.* MYLABRIS. *Geoff.*

Antennæ nearly filiform: *eyes* emarginate for the insertion of the antennæ: *body* short, oval, thick: *elytra* not covering the anus above.

Sp. 1. *Bru. Pisi.*

Bruchus Pisi. *Linn., Fabr., Oliv., Latr., Leach.*

Inhabits the south of Europe and the north of America. The larva is frequently found in peas.

Fam. XXXVII. CURCULIONIDÆ. *Leach.*

CURCULIONITES. *Latreille.*

Palpi very small, conic-subulate, scarcely discernible: *rostrum* rounded, thick, often proboscis-shaped: *labrum* none: *antennæ* with distinct joints, the eighth or ninth generally clavate, the club regular, the joints coriaceous: *head* from the eyes more or less narrowed, distinctly produced into a rostrum: *mandibles* small or minute: *mentum* not cylindric-cordate: *body* rarely cylindric: *anterior tibiæ* never triangular.

A. *Antennæ straight, not geniculated at the second joint. Body of all, from the base of the thorax, narrower, not cylindric.*

Genus 201. ATTELABUS. *Linn., Fabr., Oliv., Latr., Leach.* CURCULIO. *De Geer.*

Head behind simply elongate, produced with no neck: *tibiæ* with one

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hook at their joints: *body* ovate: *abdomen* quadrate, rounded behind: *labium* corneous, quadrate; the middle of the upper margin emarginate, obtusely unidentate.

Sp. 1. *Att. curculionoides.*

Attelabus curculionoides. *Linn., Latr., Oliv., Marsh., Leach.*

Inhabits the nut-tree and willow.

Genus 202. APODERUS. *Oliv., Latr., Leach.* ATTELABUS. *Linn., Fabr., Payk.* CURCULIO. *Marsh.*

Head with a distinct neck: *tibiæ* with one hook at their joints: *body* ovate: *abdomen* quadrate, rounded behind: *labium* corneous, quadrate, the middle of the upper margin emarginate, obtusely unidentate.

Sp. 1. *Apo. Coryli.*

Attelabus Coryli. *Linn., Fabr., Payk.* Curculio Coryli. *Marsham.* Apoderus Coryli. *Latr., Leach.*

Inhabits the nut-tree, and is very common.

Genus 203. RHYNCHITES. *Herbst., Latr., Leach.* CURCULIO. *Linn., De Geer, Marsh.* RHINOMACER. *Geoff., Clairv.* ATTELABUS. *Fabr., Oliv.*

Head elongate behind the eyes, with no neck: *clypeus* dentate: *tibiæ* with very short heels: *abdomen* quadrate, rounded behind: *body* ovate, narrowly produced before: *thorax* conic-cylindric, broader behind (often with a spine on each side in the male): *labium* membranaceous, small, the apex rounded, villose, entire.

Sp. 1. *Rhyn. Bacchus.*

Inhabits Europe, and is found in England on the nut- and plum-tree, but is very rare.

Genus 204. DEPORÄUS. *Leach's MSS.*

Head elongate, with no neck: *clypeus* subdentate: *tibiæ* with short heels: *abdomen* quadrate-rounded behind: *hinder thighs* thick and formed for leaping.

Sp. 1. *Dep. Betulæ.*

Rhynchites Betulæ. *Herbst.*

Inhabits the oak, birch, and hazel.

Genus 205. APION. *Herbst, Latr., Kirby, Leach.* CURCULIO. *Linn., Marsh.*

Eyes prominulous: *head* elongate behind: *abdomen* subovate: *tibiæ* with obsolete heels: *labium* subquadrate, entire.

The Rev. William Kirby has given an admirable paper to the *Linnean Society of London*, in which upwards of sixty species of this genus are described, in the ninth volume of their *Transactions*. He has added a supplement which is published in the tenth volume.

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The whole of the insects of this genus are very small; they are in general found at the roots of grass, on the blossoms of clover, &c. and in sand-pits: in the months of April, May and June, they may be taken in profusion.

B. *Antennæ geniculated, the basal joint very much elongated, generally received in a lateral oblique groove, (at the base at least,) or the sides of the rostrum. (Antennæ in all clavate, the club generally composed of firmly connected joints, the last acute. Tarsi with the last joint but one bifid, or emarginate above, cordate.)*

a. *Antennæ inserted beyond the base of the rostrum, larger than the head; the club distinctly many-jointed, ovate. Mandibles generally obtuse. Tibiæ at the apex ciliated with spines, in a few terminated by a strong hook. Body ovate or elliptic. Colours various.*

Genus 206. CURCULIO *of authors.* BRACHYRINUS. *Latr.*

Body ovate, convex, narrower before: *thorax* round or conic-cylindric, narrower than the base of the elytra: *scutellum* extremely minute: *abdomen* ovate-conic, subovate, or globose: *lip* minute: *antennæ* eleven-jointed: *hinder feet* not formed for leaping.

Sp. 1. *Cur. argentatus.*

Curculio argentatus. *Gmelin, Marsh., Fabr., Leach.* Brachyrinus argentatus. *Latr.*

Inhabits Europe, and is very abundant in this country on the oak in May and June.

Genus 207. LIXUS. *Latr., Fabr., Leach.* LEPTOSOMA. *Leach.* CURCULIO. *Linn., Geoff., Fabr., Marsh.*

Body elongate-ovate: *rostrum* as broad as the head: *lip* small, entire, transverse-quadrate, corneous, narrower than the mentum.

Sp. 1. *Lix. paraplecticus.*

Lixus paraplecticus. *Leach.*

Inhabits the *Phellandrium aquaticum.*

Genus 208. RHYNCHÆNUS. *Fabr., Oliv., Leach.* CURCULIO. *Linn., Geoff., Lam., Latr.*

Body oblong-ovate, twice as long as broad: *antennæ* eleven-jointed, the club distinct: *wings* perfect: *rostrum* moderate.

Sp. 1. *Rhyn. Pini.*

Rhynchænus Pini. *Leach.* Curculio Pini. *Linné.*

Inhabits the *Pinus sylvestris.*

Genus 209. BALANINUS. *Germar.*

Body oblong, twice as long as broad: *antennæ* twelve-jointed: *wings* perfect: *rostrum* very long and very slender.

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Sp. 1. *Bal. Nucum.*

Rhynchænus Nucum. *Fabr.*

Inhabits the nut-tree: the larva living on the kernel of the fruit is called the nut-maggot.

Genus 210. LIPARUS. *Oliv., Leach.* Curculio. *Linn., Latr., Marsh.* Rhynchænus. *Fabr.*

Body oblong-ovate, twice as long as broad: *antennæ* with the club three-jointed beginning at the ninth joint, or four-jointed beginning at the eighth joint: *wings* none.

Sp. 1. *Lip. Germanus.*

Curculio Germanus. *Linn., Marsh.* Rhynchænus fusco-maculatus. *Fabr.* Liparus Germanus. *Leach.*

Inhabits Europe: is rare in Britain, but has been taken near Dover and Hastings.

Genus 211. CRYPTORHYNCHUS. *Illig., Leach.* Curculio. *Linn., Marsh.* Rhynchænus. *Fabr.*

Body round-oval, half as long again as broad: *abdomen* short, triangular-quadrate: *anus* naked: *rostrum* applied to the breast: *coleoptra* subquadrate, the diameters nearly equal: *hinder feet* not formed for leaping: *mentum* corneous, sub-obtrigonate.

Sp. 1. *Crypt. Erysimi.*

Rhynchænus Erysimi. *Fabr.* Cryptorhynchus Erysimi. *Illiger, Leach.*

Inhabits

Genus 212. CIONUS. *Clairv., Latr., Leach.* Rhynchænus. *Fabr.* Curculio. *Linn., Geoff., Oliv.*

Body quadrate-ovate, thick, a little longer than broad: *abdomen* large, subquadrate, a little narrower and rounded behind: *anus* not naked: *rostrum* applied to the breast: *coleoptra* convex, as broad as long, inflexed behind: *hinder feet* not formed for leaping.

Sp.1. *Cio. Scrophulariæ.*

Curculio Scrophulariæ. *Linn., Marsh.* Rhynchænus Scrophulariæ. *Fabr.* Cionus Scrophulariæ. *Clairv., Leach.*

Inhabits the water betony.

Genus 213. ORCHESTES. *Oliv., Illig., Leach.* Rhynchænus. *Clairv., Fabr., Latr.* Curculio. *Linn., Marsh.*

Body ovate: *abdomen* elongate-quadrate, rounded behind: *elytra* inflexed behind, covering, or at least touching the anus: *hinder feet* formed for leaping.

Sp. 1. *Orc. Alni.*

Curculio Alni. *Linn., Marsh.* Rhynchænus Alni. *Fabr.* Orchestes Alni. *Leach.*

Inhabits the alder.

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b. *Antennæ inserted at the base of the rostrum. Tarsi inflected to the internal side of the tibiæ.*

Genus 214. CALANDRA. *Clairv., Fabr., Leach.* CURCULIO. *Linn., Geoff., Oliv.* RHYNCHOPHORUS. *Herbst.*

Body elliptic-oval, flat above: *eyes* immersed, oblong, encircling the head beneath: *rostrum* thickened at the insertion of the antennæ: *elytra* plain, not covering the anus above: *anus* acutely prominent: *feet* strong.

Sp. 1. *Cal. granaria.*

Calandra granaria. *Fabr., Latr., Leach.* Curculio granarius. *Marsh.*

Inhabits

Genus 215. COSSONUS. *Clairv., Fabr., Latr., Leach.* CURCULIO. *Payk., Herbst.*

Body very much lengthened, sublinear or subcylindric, narrow before: *elytra* covering the anus above: *tibiæ* terminated by a hook internally: *back* flat, depressed.

Sp. 1. *Cos. linearis.*

Cossonus linearis. *Clairv., Fabr., Latr., Leach.* Curculio linearis. *Payk., Marsh.* Curculio parallelopipedos. *Herbst.*

Inhabits trunks of trees in Windsor Forest.

OBS.—In addition to the above in *Germar's and Zincker Sommer's Magazin der Entomologie*, vol. iii. for 1817, notice is given of the following genera as lately established, (the species mentioned may be considered the types).

Genus MAGDALIS. *Germar.*
Sp. 1. Cur. aterrimus.

Genus BAGOUS. *Germar.*
Sp. 1. Cur. binodulus. *Herbst.* 2. Cur. Alismatis. *Gyll.*

Genus SITONA. *Germar.*
Sp. 1. Cur. hispidulus. 2. Cur. lineatus.

Genus CURCULIO.
Sp. 1. Cur. sulcirostris.

Genus GRYPHUS. *Germar.*
Sp. 1. Cur. Equiseti.

Genus LEPYRUS. *Germar.*
Sp. 1. Cur. triguttatus.

Genus PACHYGASTER. *Germar.*
Sp. 1. Cur. niger.

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Genus HYPERA. *Germar.*
Sp. 1. Cur. nigrorostris.

Genus THYLACITES. *Germar.*
Sp. 1. Cur. incanus.

Division II.—*Head not gradually prolonged into a rostrum. Tarsi not spongy beneath. Antennæ forming a solid mass, shorter or not much longer than the head.*

Fam. XXXVIII. BOSTRICIDÆ. *Leach.*

BOSTRICINI. *Latreille.*

Body cylindric or globose: *head* globose: *tibiæ* compressed, the anterior ones dentated: *antennæ* eight- or ten-jointed; the first joint elongate, the two or three last joints forming a large mass: *palpi* very small, generally conic, rarely filiform.

STIRPS 1.—*Club* of the *antennæ* commencing before the ninth joint.

Genus 216. HYLURGUS. *Latr., Leach.* IPS. *De Geer, Marsh.* SCOLYTUS. *Oliv.*

Tarsi with the penultimate joint bifid: *antennæ* with the club commencing at the eighth joint, very little or not at all compressed.

Sp. 1. *Hyl. Piniperda.*

Ips Piniperda. *Marsh.* Hylurgus Piniperda. *Latr.*

Inhabits this country, perforating the bark of the pine.

Genus 217. TOMICUS. *Latr., Leach.*. DERMESTES. *Linnæus.* IPS. *De Geer.* BOSTRICHUS. *Fabr., Payk.* SCOLYTUS. *Oliv.*

Tarsi with entire short joints: *antennæ* with the club much compressed, beginning at the seventh joint, distinctly annulated: *body* not linear.

Sp. 1. *Tom. Typographus.*

Dermestes Typographus. *Linn.* Ips Typographe. *De Geer.* Bostrichus Typographus. *Fabr., Payk.* Ips Typographus. *Marsh.* Scolytus Typographus. *Oliv.* Tomicus Typographus. *Latr., Leach.*

Inhabits Europe, under the bark of trees, which it gnaws into various labyrinth-like passages.

Genus 218. PLATYPUS. *Herbst, Latr., Leach.* BOSTRICHUS. *Hellwig., Fabr.* SCOLYTUS. *Panz.*

Tarsi with entire long joints: *antennæ* with the club much compressed, commencing at the sixth joint: annulations not or but slightly distinct: *body* linear.

Sp. 1. *Pla. cylindricus?*

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Platypus cylindricus. *Herbst, Latr.* Bostrichus cylindricus. *Fabr.* Scolytus cylindricus. *Oliv.*

Discovered to be a native of Britain by Mr. D. Bydder, who took it in the New Forest of Hampshire from beneath the bark of trees.

STIRPS 2.—*Antennæ* with the club beginning at the ninth joint.

Genus 219. SCOLYTUS. *Geoff., Schæffer, Latr., Oliv., Leach.*

Tarsi with the last joint but one bifid: *antennæ* with the club compressed, obovoid, the apex rounded.

Sp. 1. *Sco. Destructor.*

Scolytus Destructor. *Oliv., Latr.* Ips Scolytus. *Marsh.* Hylesinus Scolytus. *Fabr.*

Inhabits beneath the bark of the elm.

Genus 220. HYLESINUS. *Fabr., Latr., Leach.*

Tarsi with their penultimate joint bifid: *antennæ* with the club little or not compressed, ovoid, the extremity pointed.

Sp. 1. *Hyl. crenatus.*

Hylesinus crenatus. *Fabr., Latr.* Scolytus crenatus. *Oliv.*

Inhabits Europe, under the bark of trees.

Fam. XXXIX. CISIDÆ. *Leach.*

Body ovoid or oblong; in some depressed, in others linear: *palpi* filiform or bent at their extremities: *antennæ* ten-jointed, increasing towards their extremities or terminated by a perfoliated mass.

STIRPS 1.—*Antennæ* with the club three-jointed, perfoliated.

Genus 221. CIS. *Latr., Leach.*

Antennæ twice as long as the head; *body* oval, depressed.

Sp. 1. *Cis Boleti.*

Dermestes Boleti. *Scopoli.* Anobium Boleti. *Fabr., Illig., Payk.* Anobium bidentatum. *Oliv.* Ptinus Boleti. *Marsh.*

Inhabits the *Boletus versicolor.*

STIRPS 2.—*Antennæ* with a nearly globose two-jointed club.

Genus 222. CERYLON. *Latr., Leach.*

Body elongate: *thorax* quadrate, with the hinder margin straight, contiguous with the elytra: *abdomen* not pedunculated.

Sp. 1. *Cer. histeroides.*

Lyctus histeroides. *Fabr., Payk., Panz.* Rhyzophagus histeroides. *Herbst.* Cerylon histeroides. *Latr.*

Inhabits Europe, beneath the bark of trees.

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Genus 223. MONOTOMA. *Herbst, Leach.* CERYTON. *Latr.*

Body elongate, linear: *thorax* quadrate, with the hinder margin distant from the base of the elytra: *abdomen* somewhat peduncu-lated.

Sp. 1. *Mon. Juglandis.*

Lyctus Juglandis. *Fabr., Payk., Panz.* Corticaria taxicornis. *Marsh.*

Inhabits Europe, under the bark of the stumps of trees, particularly those in damp situations.

Fam. XL. MYCETOPHAGIDÆ. *Leach.*

Body ovoid or oblong; in some depressed, in others linear: *palpi* filiform or bent at their extremities: *antennæ* eleven-jointed: *mandibles* little or not at all prominent.

STIRPS 1.—*Antennæ* gradually thickening towards their extremities. *Tarsi* with the first joint longer than the following one.

Genus 224. MYCETOPHAGUS. *Fabr., Payk., Oliv., Panz., Latr., Leach.* TRITOMA. *Geoff.* DERMESTES. *Thunb.* SILPHOIDES. *Herbst.* BOLETARIA. *Marsh.*

Body oval: *antennæ* with the last joint elongate, ovate: *maxillary palpi* prominent.

Sp. 1. *Myc. quadripustulatus.*

Mycetophagus quadripustulatus. *Fabr., Latr., Panz., Payk.* Boletaria quadripustulata. *Marsh.*

Inhabits *fungi.*

STIRPS 2.—*Antennæ* gradually thickening towards their extremities, or with a three-jointed club.

a. *Tarsi with the first joint longer than the second. Palpi very short, the maxillary ones but little or not at all prominent. Antennæ as long as the thorax or less.*

Genus 225. LATRIDIUS. *Herbst, Leach.* IPS. *Oliv.* CORTICARIA. *Marsham.* DERMESTES. *Fabr., Paykull.*

Antennæ with the second joint larger than the third.

Sp. 1. *Lat. porcatus.*

Latridius porcatus. *Herbst, Leach.* Latridius minutus. *Latr.* Dermestes marginatus. *Paykull.*

Inhabits damp paper and old wood in houses.

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Genus 226. SILVANUS. *Latr., Leach.* Tenebrio. *De Geer.* Dermestes. *Fabr., Panz.* Ips. *Olivier.* Colydium. *Payk., Herbst.* Corticaria. *Marsham.*

Antennæ with the second and following joints to the eighth joint nearly equal.

Sp. 1. *Sil. frumentarius.*

Colydium frumentarium. *Panzer.* Corticaria frumentaria. *Marsh.* Silvanus frumentarius. *Latr., Leach.*

Inhabits damp cellars in old wood and paper.

Stirps 3.—*Antennæ* eleven-jointed. *Mandibles* prominent or exserted.

* *Mandibles small. Body long and linear.*

Genus 227. LYCTUS. *Fabr., Payk., Leach.*

Antennæ with a two-jointed club: *thorax* long and linear.

Sp. 1. *Lyc. oblongus.*

Lyctus oblongus. *Latr., Leach.* Lyctus canaliculatus. *Fabr.* Ips oblongus. *Oliv.* Bitoma unipunctata. *Herbst.* Corticaria oblonga. *Marsh.*

Inhabits old wood.

** *Mandibles large. Body elongate, much depressed, nearly equally broad.*

Genus 228. TROGOSITA. *Fabr., Oliv., Illig., Latr., Lam., Leach.*

Thorax almost quadrate, separated from the abdomen by a remarkable interval: *antennæ* moniliform, shorter than the thorax, compressed towards the apex: *labrum* exserted, coriaceous, small, hairy in front.

Sp. 1. *Tro. mauritanica.*

Tenebrio mauritanicus. *Rossi, Marsh.* Trogosita caraboides. *Fabr., Illig., Payk., Herbst, Latr.* Trogosita mauritanica. *Oliv., Leach.*

Inhabits Europe, under stones on the banks of rivers.

Fam. XLI. Pryonidæ. *Leach.*

Lip much widened at its extremity, cordiform: *body* elongate: *antennæ* long, generally inserted in a notch in the eyes: *labrum* very small or almost none.

Genus 229. PRIONUS. *Geoff., Fabr., Oliv., Latr., Leach.*

Thorax with the sides gently sloping, dentated: *antennæ* serrated, a little shorter than the body; of the male twelve, of the female eleven-jointed.

Sp. 1. *Pri. coriarius.*

Cerambyx coriarius. *Linn., Marsh.* Prionus coriarius. *Latr., Fabr., Oliv., Leach.*

Inhabits old trees; flies in the evening.

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Fam. XLII. CERAMBYCIDÆ. *Leach.*

CERAMBYCINI II. *Latr.*

Lip much widened at its extremity, cordiform: *body* elongate: *labrum* very apparent: *antennæ* inserted in a notch in the eyes.

Subdivision 1.—*Head vertical. Palpi almost filiform.*

Genus 230. LAMIA. *Latr., Fabr., Leach.*

Antennæ ten-jointed, longer than the body.

This genus is divided into sections.

A. *Body depressed.*

Sp. 1. *Lam. ædilis.*

Lamia ædilis. *Fabr., Latr., Leach.* Cerambyx ædilis. *Linn., Marsh.*

Inhabits the trunks of trees, but is very rare in Britain.

B. *Body not depressed.*

Sp. 2. *Lam. nebulosa.*

Cerambyx nebulosus. *Fabr., Marsh.* Lamia nebulosa. *Latr., Leach.*

Inhabits dried faggots in woods, hurdles, &c.

Sp. 3. *Lam. Textor.* (*Pl. 2. fig. 24.*)

Lamia Textor. *Fabr., Latr.* Cerambyx Textor. *Marsh.*

Inhabits the wood of willow-trees in Hampshire and near Bristol.

C. *Body linear. Thorax not spined at the sides.*

Sp. 4. *Lam. oculata.*

Cerambyx oculatus. *Marsh.* Saperda oculata. *Fabr.* Lamia oculata *Latr.*

Inhabits the trunks of trees, but is very rare in England.

Genus 231. SAPERDA. *Leach.*

Antennæ eleven-jointed, longer than the body: *body* linear: *thorax* without spines.

Sp. 1. *Sap. lineato-collis.*

Cerambyx lineato-collis. *Marsh.* Saperda lineato-collis. *Leach's Zool. Misc.* vol. i.

Inhabits the trunks of trees, but is very rare. Dr. Leach suspects this species to be Saperda Cardui *Fabr.*

Subdivision 2.—*Head nutant. Palpi with the last joint thicker than the others.*

Genus 232. CERAMBYX. *Linn., Fabr., &c.*

Antennæ longer than the body: *palpi* with the last joint obconic, compressed: *thorax* with a spine on each side.

Sp. 1. *Cer. moschatus.*

Inhabits willows in Europe, emitting, whilst alive, a fine smell of musk.

Genus 233. CLYTUS. *Fabr., Leach.* CERAMBYX. *Linn., Marsh.*

Labial palpi with the last joint obtrigonate: *thorax* without spines, globose: *antennæ* shorter than the body: *hinder thighs* clavate.

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Sp. 1. *Cly. Arietis.* (*Pl. 2. fig. 25.*)
Cerambyx Arietis. *Linn., Marsh.* Clytus Arietis. *Fabr., Leach.* Callidium Arietis. *Latr.*
Inhabits trunks of trees in sunny weather.

Genus 234. CALLIDIUM. *Fabr., Latr., Leach.* CERAMBYX. *Linn., Marsh.*

Labial palpi with the last joint obtrigonate: *thorax* orbicular, depressed or but little convex: *antennæ* setaceous, as long as the body: *hinder thighs* abruptly clavate.

Sp. 1. *Cal. violaceum.*
Cerambyx violaceus. *Linn., Marsh.* Callidium violaceum. *Fabr., Latr., Leach.*
Inhabits Europe. In Britain it is generally found on palings. I lately bred a specimen from a larva found in a Norway deal, and I am informed by an intelligent carpenter from whom I received the larva, that he has frequently met with them in new wood. Mr. Kirby has given an interesting history of this species in the *Transactions of the Linnean Society*, vol. v.

Genus 235. MOLORCHUS. *Fabr.*

Elytra abbreviated.

Sp. 1. *Mol. major.*
Necydalis major. *Linn.* Molorchus Umbellatarum. *Fabr.*
Inhabits flowers and hedges.

Fam. XLIII. LEPTURADÆ. *Leach.*

Lip much widened at its extremity, cordiform: *body* elongate: *labrum* very apparent: *antennæ* inserted between the eyes.

Genus 236. LEPTURA *of authors.*

Thorax not spined on each side.

Sp. 1. *Lep. elongata.*
Leptura elongata. *Fabr., Latr., Marsh., Leach.*
Inhabits various flowers in hedges, and is pretty common.

Sp. 2. *Lep. quadrifasciata.* (*Pl. 2. fig. 26.*)
Inhabits umbelliferous plants; is rather scarce.

Genus 237. RHAGIUM. *Fabr., Leach.* LEPTURA. *Linn., Latr., Marsh.*

Thorax with a spine on each side: *antennæ* setaceous.

Sp. 1. *Rha. vulgare.* Leach.
Leptura Inquisitor. *Latr., Marsh.* Rhagium Inquisitor. *Fabr.*
Inhabits umbelliferous plants in woods, and may be found in decayed stumps of trees in the winter months.

Genus 238. HARGIUM. *Leach's MSS.*

Thorax with a spine on each side: *antennæ* thickest in their middle.

Sp. 1. *Rha. Inquisitor.*

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Leptura Inquisitor. *Linné.* Rhagium Indagator. *Fabr.*
Inhabits England, but is very rare.

Fam. XLIV. Criocerida. *Leach.*

Lip not cordiform: *maxillæ* with their external division not resembling a two-jointed palpus: *body* elongate: *thorax* cylindric or quadrate: *mandibles* bifid or notched at their extremities.

Genus 239. DONACIA. *Fabr., Payk., Hoppe, Oliv., Latr., Leach.*
Leptura. *Linn., Marsh.*

Antennæ with elongate-cylindric joints, those of the base obconic: *eyes* not notched: *abdomen* elongate, triangular: *hinder thighs* thick.

* *Hinder thighs dentated.*

Sp. 1. *Don. micans.*
Donacia micans. *Hoppe, Leach.* Leptura micans. *Marsh.*
Inhabits aquatic plants.

** *Hinder thighs simple.*

Sp. 2. *Don. simplex.*
Leptura simplex. *Marsh.*
Inhabits aquatic plants.

Obs.—Donacia Zosteri *Fabr.*, and Equiseti, both of which have lately been taken in Britain, constitute the genus Macroplea of *Hoffmansegg.*

Genus 240. CRIOCERIS. *Geoff., Oliv., Lam., Leach.*

Antennæ moniliform, with the exception of the basal joints which are globose: *eyes* notched: *neck* distinct: *abdomen* quadrate.

Sp. 1. *Cri. merdigera.* (*Pl. 2. fig.* 14.)
Crioceris merdigera. *Latr., Leach.* Lema merdigera. *Fabr.* Auchenia merdigera. *Marsh.* Chrysomela merdigera. *Linn.*
Inhabits the white lily.

Fam. XLV. Chrysomelidæ. *Leach.*

Chrysomelinæ. *Latreille.*

Lip not cordiform: *maxillæ* with their external division resembling a biarticulate palpus: *body* more or less ovoid or oval: *thorax* transverse, or not longer than broad.

Stirps 1.—*Palpi* very small: *antennæ* inserted near each other between the eyes, at a distance from the mouth: *body* shield-shaped: *thorax* semicircular.

Genus 241. CASSIDA *of authors.*

Antennæ thicker towards their extremities, their base concealed by the thorax: *body* nearly orbiculate.

Sp. 1. *Cass. equestris.*
Cassida equestris. *Fabr., Payk., Panz., Latr., Leach.* Cassida viridis. *Marsh., Illig.*
Inhabits the *Mentha sylvestris.*

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STIRPS 2.—*Maxillary palpi* very apparent: *antennæ* inserted very near to each other, between the eyes, towards the middle of the face.

Division I.—*Feet not formed for leaping.*

Genus 242. GALERUCA. *Geoff., Latr., Fabr., Oliv., Leach.*

Palpi with the two last joints very slightly different in size, the last conic: *antennæ* shorter than the body, the joints obconic; the second joint half the length of the third.

Sp. 1. *Gal. Tanaceti.* (*Pl. 2. fig. 13.*)

Chrysomela Tanaceti. *Marsh.* Galeruca Tanaceti. *Latr., Fabr.*

Inhabits chalk-pits.

Genus 243. ADIMONIA. *Schrank, Leach.*

Palpi with the two last joints not very different in size, the last joint conic: *antennæ* shorter than the body, the joint obconic, with the second and third joints shorter than the fourth joint.

Sp. 1. *Ad. nigricornis.*

Crioceris nigricornis. *Fabr.* Galeruca nigricornis. *Latr.* Chrysomela halensis. *Marsh.* Adimonia nigricornis. *Leach.*

Inhabits hedges.

Genus 244. LUPERUS. *Geoff., Oliv., Latr., Leach.*

Palpi with the two last joints nearly equal in size, the last conic: *antennæ* as long as the body, the joints cylindric, elongate.

Sp. 1. *Lup. flavipes.*

Luperus flavipes. *Latr., Leach.* Crioceris flavipes. *Fabr.*

Inhabits bushes in damp woods.

Division II.—*Hinder feet formed for leaping, the thighs being incrassated.*

Genus 245. HALTICA. *Leach.* ALTICA. *Geoff., Oliv., Panz., Latr.* CHRYSOMELA. *Linn., De Geer, Marsh.* CRIOCERIS. *Fabr.* LEMA. *Fabr.* GALERUCA. *Fabr.*

Antennæ with the second joint generally a little shorter than the first.

* *Body ovate.*

Sp. 1. *Hal. oleracea.*

Altica oleracea. *Latr., Panz.* Chrysomela oleracea. *Marsh.* Haltica oleracea. *Leach.*

Inhabits sand-pits, and nettles in hedges.

** *Body nearly orbiculate.*

Sp. 2. *Hal. testacea.*

Galeruca testacea. *Fabr.* Altica testacea. *Latr.* Chrysomela testacea. *Marsh.* Haltica testacea. *Leach.*

Inhabits sand-pits, and nettles in hedges.

STIRPS 3.—*Maxillary palpi* very apparent: *antennæ* inserted before the eyes, gradually thickening towards their points: *head* nutant, forming an obtuse angle with the thorax.

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Division I.—*Mandibles short, obtuse, truncated or terminated by a very short point: antennæ with the four last joints globose or turbinated.*

Subdivision 1.—*Antennæ with the last four joints turbinated. Body hemispheric or oval. Thorax transverse.*

Genus 246. CHRYSOMELA. *Latr., Fabr., &c.*

Palpi terminated by two joints of nearly an equal length, the last almost ovoid truncate or nearly cylindric: *sternum* not produced.

* *Thorax with the sides incrassated, as if margined: body ovate quadrate.*

Sp. 1. *Chry. Banksii.*
Chrysomela Banksii. *Fabr., Latr., Marsh., Leach.*
Inhabits nettles in lanes.

** *Thorax with the sides not incrassated. Body ovate quadrate.*

Sp. 2. *Chry. Litura.*
Chrysomela Litura. *Fabr., Latr., Marsh., Leach.*
Inhabits the broom.

*** *Body elongate-ovate quadrate.*

Sp. 3. *Chry. marginella.*
Chrysomela marginella. *Fabr., Latr., Marsh., Leach.*
Inhabits plants growing by the side of ditches.

Obs.—Chrysomela tenebricosa *Linn.* forms the Genus Timarcha *(of Hoppe)?*

Subdivision 2.—*Antennæ with the four last joints semi-globose, almost forming a club. Body elongate-quadrate. Thorax as long as broad.*

Genus 247. HELODES. *Payk., Fabr., Oliv., Leach.*

Palpi short, thicker at their middle, the last joint short-obconic.

Sp. 1. *Hel. Phellandrii.*
Helodes Phellandrii. *Payk., Fabr.* Proscuris Phellandrii. *Latr.*
Inhabits flowers in meadows.

Stirps 4.—*Maxillary palpi* very apparent: *antennæ* inserted before the eyes: *head* vertical: *palpi* with the last joint conic-cylindric: *body* short-cylindric.

Genus 248. CRYPTOCEPHALUS. *Geoff., Fabr., Oliv., Latr., Lam., Marsh., Leach.*

Antennæ simple, filiform, about the length of the body.

Sp. 1. *Crypt. sericeus.*
Chrysomela sericea. *Linn.* Cryptocephalus sericeus. *Fabr., Oliv., Marsh., Leach.*
Inhabits the flowers of the dandelion.

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Genus 249. CLYTHRA. *Laicharting, Fabr., Oliv., Latr., Leach.*

Antennæ short, serrated, exserted: *palpi* alike.

Sp. 1. *Cly. quadripunctata.*
Clythra quadripunctata. *Fabr., Latr., Leach.* Cryptocephalus quadripunctatus. *Marsh.* Chrysomela quadripunctata. *Linn.*
Inhabits the oak, but is very local.

Fam. XLVI. EROTYLIDÆ.

Antennæ moniliform below, terminated by an ovoid club: *thorax* elevated at the middle: *tibiæ* elongate-triangular.

STIRPS. 1.—*Palpi* all terminated by large semilunar or securiform joints.

Genus 250. TRITOMA. *Fabr., Oliv., Latr., Leach.*

Body short-ovate, the back elevated in the middle: *thorax* with the middle of the hinder margin dilated into an angle.
Sp. 1. *Trit. bipustulatum.* (*Pl. 2. fig. 9.*)
Tritoma bipustulatum. *Fabr., Payk., Latr., Leach.*
Inhabits *boleti.*

Genus 251. TRIPLAX. *Payk., Fabr., Oliv., Leach.* SILPHA. *Linn., Marsh.*

Body oval.

Sp. 1. *Tri. russica.*
Silpha russica. *Linn., Marsh.* Triplax russica. *Payk., Fabr.* Tritoma russica. *Latr., Leach.*
Inhabits dead trees and *fungi.*

STIRPS 2.—*Maxillary palpi* filiform, or thicker towards their extremities.

* *Tarsi with the penultimate joint bilobate. Body hemispheric, but not contractile into a ball.*

Genus 252. PHALACRUS. *Latr., Payk., Leach.*

Antennæ with a three-jointed club.

Sp. 1. *Pha. bicolor.*
Phalacrus bicolor. *Payk., Latr., Leach.* Dermestes Calthæ. *Scopoli.* Anisotoma bicolor. *Illig., Fabr.*
Inhabits various flowers.

** *Tarsi with the joints entire. Body nearly globose, contractile into a ball.*

Genus 253. AGATHIDIUM. *Illig., Latr., Leach.*

Antennæ with a three-jointed club.

Sp. 1. *Agath. nigripenne.*

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Agathidium nigripenne. *Illig.*, *Latr.*, *Leach.* Sphæridium ruficolle. *Oliv.* Anisotoma nigripennis. *Fabr.*
Inhabits sand-pits.

Section IV. *TRIMERA.*

Tarsi all three-jointed.

Fam. XLVII. Coccinellidæ. *Leach.*

Antennæ shorter than the thorax: *maxillary palpi* terminated by a large securiform joint: *body* hemispheric: *thorax* transverse, the hinder margin arcuated.

Genus 254. COCCINELLA *of authors.*

Thorax (even behind) narrower than the elytra: *body* hemispheric, approaching to ovate.
Sp. 1. *Coc. septempunctata* (Common Lady-cow or Lady-bird).
Coccinella septempunctata *of authors.*
Inhabits Europe.

Genus 255. CHILOCORUS. *Leach.*

Thorax lunate, without hinder angles: *body* entirely marginated.

Sp. 1. *Chi. Cacti.*
Coccinella Cacti. *Latr.*, *Fabr.* Chilocorus Cacti. *Leach.*
Inhabits white-thorn hedges.

Fam. XLVIII. Endomychidæ. *Leach.*

Antennæ longer than the thorax: *maxillary palpi* not terminated by a large joint: *body* more or less ovoid: *thorax* almost quadrate.

Genus 256. ENDOMYCHUS. *Payk.*, *Fabr.*, *Leach.*

Antennæ with the greater portion of their joints very short, nearly cylindric; the ninth joint longer than the one before it, the last with the apex truncate or obtuse: *palpi* with their extremities thicker: *thighs* not abruptly clavate: *body* ovate: *thorax* short, with the base gradually enlarging from the apex, not narrowed behind: *mandibles* with their points distinctly bifid or bidentate.
Sp. 1. *End. coccineus.*
Chrysomela coccinea. *Linn.* Endomychus coccineus. *Payk.*, *Latr.*, *Fabr.*, *Leach.* Tenebrio coccineus. *Marsh.*
Inhabits beneath the bark of the stumps of trees: this is a very local insect. In Coombe Wood, Surrey, they occurred for a year or two in profusion in the months of May and June. The larvæ resemble the female glow-worm, but are not more than a quarter of an inch in length, and are found beneath the bark of trees, particularly those in moist places.

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Genus 257. LYCOPERDINA. *Latr., Leach.*

Antennæ moniliform, gradually thickening towards their extremities, the ninth joint scarcely longer than the one before it: *maxillary palpi* filiform: *labial palpi* with the last joint large, almost ovoid: *thighs* abruptly clavate: *body* elongate-ovate: *thorax* with the anterior angles a little dilated, narrowed behind: *mandibles* with their points very acute, undivided.

Sp. 1. *Lyc. Bovistæ.*

Endomychus Bovistæ. *Payk., Fabr.* Tenebrio Bovistæ. *Marsh.* Lycoperdina immaculata. *Latr.* Lycoperdina Bovistæ. *Leach.*

Inhabits the *Lycoperdium* or puff-ball.

Order IV. DERMAPTERA. *De Geer, Leach, Kirby.*

Order Coleoptera. *Linné, Marsham.*

Order Orthoptera. *Latreille, Lamarck.*

Characters of the Order.

Elytra somewhat crustaceous and abbreviated, of a square form; the suture straight: *wings* membranaceous, externally coriaceous, large, folded transversely and longitudinally: *anus* armed with forceps, which is horny and moveable: *body* linear depressed: *antennæ* inserted before the eyes, composed of from twelve to thirty joints; the first articulation largest, the second very small, the others short, obconic or nearly globose: *mandibles* with their points bidentate: *palpi* filiform, terminated with a very obscure tuberculiform little body or spine: *tarsi* three-jointed, villose beneath: *eyes* triangular-orbicular, and but little prominent.

Obs.—The genera are founded on the number of joints in the antennæ.

Genus 258. FORFICULA *of authors.*

Antennæ composed of fourteen joints.

Sp. 1. *For. auricularia.* Forceps at the base internally denticulated, and a little beneath with a tooth on each side: elytra yellowish-brown, with the disk darker.

Forficula auricularia *of authors.*

Inhabits Europe. Mr. Marsham has considered the sexes of this insect as two species, under the names *auricularia* and *neglecta.*

Genus 259. LABIA. *Leach.*

Antennæ twelve-jointed.

Sp. 1. *Lab. minor.* Forceps denticulated within. (*Pl. 4. fig. 16.*)

Forficula minor. *Fabr., Panzer, Leach.*

Inhabits dung-hills, under clods of earth, stones, &c. The forceps of

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the male are somewhat larger than that of the female, which character Mr. Marsham has considered as specific.

Genus 260. LABIDURA. *Leach.*

Antennæ with about thirty joints.

Sp. 1. *Labid. gigantea.* Entirely testaceous yellow.

Forficula gigantea. *Fabr.*

Inhabits Europe. It was discovered to inhabit Britain by the Rev. William Bingley, who observed them on the sea-coast under stones near Christchurch, Hampshire, where they occurred in great abundance.

Order V. ORTHOPTERA. *Leach.*

Order Orthoptera. *Oliv., Lam., Latr.*

Class Ulonata. *Fabr.*

Order Hemiptera. *Linné.*

Characters of the Order.

Elytra coriaceous, the internal margin of one overlapping the same margin of the other: *wings* membranaceous, the anterior margin coriaceous, longitudinally folded: *palpi* short: *body* elongate, narrow: *tarsi* with three or four very rarely with five joints.

Fam. I. Achetidæ. *Leach.*

Gryllides. *Latreille.*

Elytra horizontal: *wings* longitudinally folded, often produced beyond the elytra: *tarsi* three-jointed: *hinder feet* formed for jumping.

Stirps 1.—*Antennæ* not longer than the thorax: *anterior feet* compressed, formed for digging: *oviduct* not exserted.

Genus 261. GRYLLOTALPA. *Ray, Latr., Leach.*

Antennæ setaceous, composed of a vast number of joints (beyond sixty): *anterior tibiæ* and tarsi formed for digging; two first joints of the tarsi very large, dentiform: *hinder feet* little formed for jumping.

Sp. 1. *Gryl. vulgaris.* Above fuscous, ferruginous yellowish beneath: *anterior tibiæ* quadridentate: *wings* twice the length of the elytra.

Gryllus Gryllotalpa. *Linn.* Acheta Gryllotalpa. *Fabr.* Gryllotalpa vulgaris. *Latr., Leach.*

Inhabits Europe in gardens and cultivated places, especially the sides of ponds and banks of streams: they burrow and work underground like the mole, raising a ridge as they proceed, but seldom throw up hillocks. They sometimes destroy whole beds of cabbages, young legumes and flowers. At night they come abroad and make long excursions. In fine weather, about the middle of April, and at the close of day, they begin to utter a low, dull, jarring note, continued for a long time without interruption. About the beginning of May

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they lay their eggs, two hundred or more, below ground, the female being excessively solicitous to preserve them from cold and accidents. They are said to be attracted to gardens by horse-dung, and to be expelled by the dung of hogs. They are common in some parts of Hampshire and Wiltshire.

STIRPS 2.—*Feet* not formed for digging: *oviduct* exserted: *antennæ* longer than the thorax.

Genus 262. ACHETA. *Fabr.*, *Leach.* GRYLLUS. *Linn.*, *Geoff.*, *Latr.*, *Oliv.*, *Lam.*

Sp. 1. *Ach. campestris.* Body three times longer than broad, black, shining.

Gryllus campestris. *Linn.*, *Latr.* Acheta campestris. *Fabr.*, *Leach.*

Inhabits the temperate parts of Europe; is not very common in Britain.

The house cricket belongs to this genus.

Fam. II. GRYLLIDÆ. *Leach.*

LOCUSTARIÆ. *Latreille.*

Elytra and *wings* oblique: *hinder feet* formed for jumping: *tarsi* four-jointed: *antennæ* setaceous: *oviduct* exserted.

Genus 263. CONOCEPHALUS. *Thunb.*, *Leach.* LOCUSTA. *Geoff.*, *De Geer*, *Fabr.*, *Oliv.*, *Lam.*, *Latr.*

Thorax deflexed, convex, truncated: *head* acuminated: *hinder feet* twice the length of the body: *antennæ* as long as the body.

Sp. 1. *Con. viridissimus.* Green: antennæ, vertex, dorsum of the thorax, and suture of the elytra fuscous ferrugineous.

Locusta viridissima. *Fabr.*, *Latr.* Gryllus viridissimus. *Linné.*

Inhabits Europe. In the autumn the perfect insect may be found in great plenty in the marshes near London.

Fam. III. LOCUSTIDÆ. *Leach.*

ACRYDII. *Latreille.*

Elytra and *wings* oblique: *hinder feet* formed for jumping: *tarsi* with three joints: *antennæ* filiform or ensiform: *oviduct* not exserted.

STIRPS 1.—*Hinder legs* as long as the body: *antennæ* filiform: *scutellum* short.

Genus 264. LOCUSTA. *Leach.* GRYLLUS. *Fabr.*, *Panz.*, *Linn.*

Antennæ filiform, or terminated in a club: *hinder legs* not, or scarcely, longer than the body.

OBS.—We have many indigenous species of this genus.

Sp. 1. *Loc. migratoria.* Thorax somewhat carinated: mandibles blue. This species, though not a native of this country, has been occasionally taken in Britain; in the year 1748 it appeared in several

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irregular flights in many parts of Europe, and visited England: but they perished in a very short time, before they did much harm.

"Of all the insects which are capable of adding to the calamities of the human race, locusts seem to possess the most formidable powers of destruction. Legions of these voracious animals of various species are produced in Africa, where the devastation they commit is almost incredible. The air is darkened by their numbers; they carry desolation with them wherever they pass, and in the short space of a few hours are said to change the most fertile provinces into a barren desert.

"Some of the species serve as food, and are eaten fresh as well as salted. In the latter state they are constantly exposed to sale in the Levant, but the quantity of nutritious matter is said to be very small."

STIRPS 2.—*Hinder legs* longer than the body: *antennæ* capitate: *scutellum* short.

Genus 265. GOMPHOCERUS. *Leach's MSS.* GOMPHOCEROS. *Thunb.*

Hinder legs longer than the body: *antennæ* capitate; club of the antennæ spoon-shaped in both sexes: *anterior tibiæ* simple.

Sp. 1. *Gomph. rufus.*

Gryllus rufus. *Linné.*

Inhabits England.

STIRPS 3.—*Wings* covered by the scutellum.

Genus 266. ACRYDIUM. *Fabr., Geoff., De Geer, Oliv., Leach.*

Sp. 1. *Acr. subulatum.* Obscure, testaceous brown, granulose: thorax carinated, marginated.

Gryllus subulatus. *Linn.* Acrydium subulatum. *Fabr., Oliv., Leach.* Tetrix subulata. *Latr.*

Inhabits Europe. It is found on hot and sandy banks, and is subject to some variation in colour.

The species of Acrydium are but little understood. We seem to possess three very distinct indigenous species, all varying in size, sculpture, and colour.

Order VI. DICTYOPTERA. *Leach.*

Order HEMIPTERA. *Linné.*

Class ULONATA. *Fabr.*

Order ORTHOPTERA. *Latr.*

Characters of the Order.

Elytra coriaceous, nervose, decussating each other: *wings* membranaceous, with a few longitudinal folds: *maxillary palpi* elongate: *body* depressed, oval, or somewhat orbicular: *tarsi* with five joints.

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Genus 267. BLATTA. *Linn., Fabr., &c.*

Sp. 1.

"The genus *Blatta* may be defined (as it now stands), to be a general reservoir for all insects agreeing with the character of the Order. The foreign species are numerous, and but little known: much might be done towards elucidating this hitherto neglected part of entomology, and it is hoped some entomographer who has time will devote some share of his attention to the examination of the genera and species."

Order VII. HEMIPTERA.

Order Hemiptera. *Linn., Lam., Cuv., Leach.*

Class Rhyngota. *Fabr.*

Order Hemiptera. Section I. *Heteroptera.* Latr.

Characters of the Order.

Rostrum attached to the anterior extremity of the head: *elytra* somewhat crustaceous or coriaceous, with the apex membranaceous, placed in an horizontal direction, one decussating the other: *thorax* with the first segment (which bears the feet) larger than the following one: *haustellum* with three setæ: *ocelli* or little eyes two, one obsolete. (*Metamorphosis* semicomplete.)

Section I. *TERRESTRIA. Latr., Leach.*

The insects which compose this section are not only distinguished from the second section by their economy, but likewise by the structure of some essential organs: the *antennæ* of this division are exserted, and are very distinct.

Fam. I. Pentatomidæ. *Leach.*

Corisiæ I. *Latreille.*

Antennæ composed of five joints: *rostrum* with four distinct joints, the three first of nearly an equal length: *labrum* very long, striated: *tarsi* with three distinct joints, the first elongate: *head* trigonate, immersed even to the eyes in the thorax.

Stirps 1.—*Scutellum* elongate, covering the elytra and the wings.

Genus 268. TETYRA. *Fabr., Leach.* Scutellera. *Latr.* Cimex. *Linn.*

Scutellum longer than broad, not covering the sides of the abdomen: *thorax* very narrow in front: *antennæ* with the second joint longer than the third.

Sp. 1. *Tet. Maura.* Fabr.

Inhabits

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STIRPS 2.—*Scutellum* not covering the wings or elytra.

Genus 269. ÆLIA. *Fabr., Leach.*

Body ovate: *thorax* with the anterior margin much narrower than the hinder: *head* longer than broad: *antennæ* with the second joint not longer than the third, their base covered by the lateral margins of the head.

Sp. 1. *Æl. acuminata.* Pale-yellowish, longitudinally lineated with fuscous, impressed-punctate; a fuscous band running down the middle of the back divided by a whitish line; last joint of the antennæ red.

Cimex acuminatus. *Linn.* Ælia acuminata *Fabr., Leach.* Pentatoma acuminatum. *Latr.*

Inhabits grassy places: is rare in Britain.

Genus 270. PENTATOMA. *Oliv., Latr., Leach.* CIMEX. *Fabr, Wolff.*

Body ovate: *thorax* with the anterior margin much narrower than the hinder: *head* with nearly equal diameters.

Sp. 1. *Pent. bidens.* Body griseous above; thorax with a lengthened spine on each side behind.

Cimex bidens. *Fabr.* Pentatoma bidens. *Latr., Leach.*

Inhabits Europe.

Sp. 2. *Pent. prasinus.* Green above; hinder angles of the thorax without spines.

Cimex prasinus. *Fabr.* Pentatoma prasinus. *Leach.*

Inhabits woods and ferns on heaths.

Genus 271. CYDNUS. *Fabr., Leach.* PENTATOMA. *Latr.*

Body ovate, somewhat orbicular; anterior margin of the thorax narrower than the hinder: *head* nearly semicircular: *antennæ* with the second joint longer than the third: *tibiæ* spinulose.

Sp. 1. *Cyd. oleraceus.* Brassy dark green; sides of the head and thorax with a longitudinal line, on the latter red; outer margin of the elytra a spot on each, and the apex of the elytra red; thighs (apex excepted) and the middle tibiæ yellowish.

Inhabits woods and sandy situations.

Fam. II. COREIDÆ. *Leach.*

CORISIÆ II. *Latreille.*

Antennæ composed of four joints: *rostrum* with four distinct joints, the first three of nearly an equal length: *labrum* very long, striated: *tarsi* with three distinct joints, the first elongate: *head* trigonate, immersed even to the eyes within the thorax.

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Genus 272. COREUS. *Fabr., Lam., Wolff, Latr., Leach.* CIMEX. *Linn., Geoff.*

Antennæ inserted above a line drawn from the eyes to the base of the labrum; the last joint thick: *thorax* with the anterior narrower than the posterior margin: *body* ovate, the sides of the abdomen dilated: *head* trigonate; neck not apparent.

Sp. 1. *Cor. marginatus.* Red-fuscous, obscure; sides of the abdomen elevated, acute; antennæ with their internal base unidentate, the first and last joints blackish, the middle ones red; thighs beneath with a canal, and a few little teeth.

Coreus marginatus. *Fabr., Latr., Leach.* Cimex marginatus. *Linné.*

Inhabits Europe, and is common in Britain in hedges and on the dock.

Genus 273. BERYTUS. *Fabr., Leach.* NEIDES. *Latr.*

Antennæ inserted above a line drawn from the eyes to the base of the labrum; geniculated about the middle; the first joint very long, the last thick: *body* filiform: *head* somewhat conic: *neck* not apparent: *scutellum* minute, linear conic: *feet* elongate: *thighs* clavate.

Sp. 1. *Ber. tipularius.* Reddish-gray; antennæ as long as the body, with the last joint fuscous: clypeus acuminate, and produced; thorax with three elevated lines, which are parallel and longitudinal; two of these are marginal, the other dorsal; elytra striate nervous, impressed-punctate, spotted with fuscous.

Cimex tipularius. *Linné.* Berytus tipularius. *Fabr., Leach.* Neides tipularius. *Latr.*

Inhabits grassy places.

Genus 274. LYGÆUS. *Fabr., Wolff, Latr., Leach.* Cimex. *Linn., De Geer.*

Antennæ filiform, inserted beneath a line drawn from the eyes to the base of the labrum: *body* elongate ovate: *head* trigonate, neck not apparent.

Sp. 1. *Lyg. apterus.* Red with black spots: elytra abbreviated.

Inhabits woods in the autumn.

Genus 275. CAPSUS. *Fabr., Latr., Leach.* CIMEX. *Linn.*

Head trigonate, neck not apparent: *antennæ* setaceous; the second joint at the apex thick, the two last when combined much shorter than the one before it.

Sp. 1. *Cap. ater.* Body black.

Inhabits grassy places, and is very common.

Genus 276. MIRIS. *Fabr., Latr., Leach.* CIMEX. *Linn., Geoff., &c.* LYGÆUS. *Wolff.*

Antennæ setaceous, the second and following joints alike: *head* trigonate: *neck* not apparent.

Sp. 1. *Mir. vagans.* Leach.

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Genus 277. MYODOCHA. *Latr., Leach.* CIMEX. *De Geer.*

Head ovoid, with a distinct neck: *antennæ* slightly thicker towards their extremities.

Sp. 1. *Myo. tipuloides.*

Myodocha tipuloides. *Latr., Leach.* Cimex tipuloides. *De Geer, Mem. sur les Insectes,* v. 354. *tab.* 35. *fig.* 18.

Inhabits

Fam. III. CIMICIDÆ. *Leach.*

CIMICIDES I. 1. *Latreille.*

Rostrum with two or three distinct joints: *labrum* very short, not projecting: *feet* simple: *eyes* not very large: *feet* formed for walking on the earth, with distinct nails.

Genus 278. REDUVIUS. *Fabr., Oliv., Lam., Latr., Leach.* CIMEX. *Linn., Geoff., De Geer.*

Body not linear: *antennæ* inserted above a line drawn from the eyes to the base of the rostrum: *rostrum* with the middle joint evidently longer than the others: *thorax* bilobate, abruptly elevated behind: *tibiæ* alike, elongate, somewhat cylindric.

Sp. 1. *Red. personatus.* Black.

Reduvius personatus. *Latr., Fabr., Leach.*

Inhabits Europe: is rare in Britain.

Genus 279. PLOIARIA. *Scopoli, Latr., Leach.* GERRIS. *Fabr.* CIMEX. *Geoff.*

Body filiform: *four posterior feet* very long, filiform: *anterior feet* raptorious, with very long coxæ.

Sp. 1. *Plo. vagabunda.*

Gerris vagabundus. *Fabr.* Ploiaria vagabunda. *Leach.*

Inhabits

Genus 280. CIMEX. *Linn., Latr., Leach.* ACANTHIA. *Fabr.*

Body depressed: *rostrum* short, setaceous: *wings* none.

Sp. 1. *Cim. lectularius.* Reddish brown, with short hair.

Cimex lectularius. *Linn., Latr., Leach.* Acanthia lectularia. *Fabr.*

Inhabits Europe in houses, sucking the blood of man. The common bed-bug.

Genus 281. TINGIS. *Fabr., Latr., Leach.* CIMEX. *Linn., Geoff., De Geer.*

Body entirely depressed, reticulated: *feet* all simple: *antennæ* terminated by an oval joint, the third joint very long.

Sp. 1. *Tin. Cardui.* Body grayish.

Tingis Cardui. *Fabr., Panz., Latr.*

Inhabits thistles, and is very abundant.

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Fam. IV. Hydrometidæ. *Leach.*

Cimicides I. 2. *Latreille.*

Rostrum with two or three distinct joints: *labrum* very short: *eyes* moderate: *feet* very long, formed for walking on the water, with the nails very minute, inserted laterally into a fissure at the extremity of the last joint of the tarsi.

Genus 282. HYDROMETRA. *Latr., Lam., Fabr., Leach.* Cimex. *Linn., Geoff.* Aquarius. *Schellenberg.*

Antennæ setaceous, the third joint longer than the rest: *anterior feet* simple: *head* elongate-cylindric, apex thickened.

Sp. 1. *Hyd. stagnorum.* Black above: feet brown reddish.

Hydrometra stagnorum. *Fabr., Leach.* Cimex stagnorum. *Linn.* Aquarius paludum. *Schellenberg.*

Inhabits Europe in most places, and walks on the surface of the water.

Genus 283. VELIA. *Latr., Leach.* Cimex. *Rossi.* Hydrometra. *Fabr.*

Antennæ filiform, the first joint longest: *anterior feet* raptorious: *rostrum* two-jointed: *head* somewhat vertical.

Sp. 1. *Vel. rivulorum.* Black; sides of the thorax and margins of the abdomen red: thorax with two anterior punctures; each elytron with three and a spot of white; inferior sides of the abdomen punctured with black.

Hydrometra rivulorum. *Fabr.* Velia rivulorum. *Latr., Leach.*

Inhabits running waters and springs.

Genus 284. GERRIS. *Latr., Leach.* Cimex. *Linn., De Geer, Schrank, Geoff.*

Antennæ filiform, the first joint longest, the last cylindric: *anterior feet* raptorious: *rostrum* three-jointed: *head* porrected.

Sp. 1. *Ger. paludum.* Brown-olive, black above, cinereous, silky beneath: abdomen nearly equally broad: trunk as long as the head, carinated beneath, a series of impressed lines on each side: antennæ and feet black: thorax with an elevated line extending to the middle of the back: lateral margins of the thorax and abdomen with the anus reddish.

Hydrometra paludum. *Fabr.* Gerris paludum. *Latr., Leach.*

Inhabits ponds and ditches in France, England, and Sweden.

Obs.—The species of this genus are certainly but little known; they are either subject to great variation, or are very numerous.

Fam. V. Acanthidæ. *Leach.*

Cimicides II. *Latreille.*

Labrum very prominent: *eyes* very large: *feet* formed for walking and jumping.

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Genus 285. ACANTHIA. *Schrank, Latr., Leach.* CIMEX. *Linn., De Geer, Geoff.* SALDA. *Fabr.* LYGÆUS. *Wolff.*

Antennæ filiform: *rostrum* straight, long.

Sp. 1. *Acan. maculata.* Black spotted with pale colour.
Acanthia maculata. *Latr., Leach.*
Inhabits grassy banks.

Section II. *AQUATICA.* Leach.

Fam. HYDROCORISIÆ. *Latreille.*

Antennæ very minute, not exserted, inserted beneath the eyes. All the insects of this section live in the water.

Fam. VI. NEPADÆ. *Leach.*

Anterior tarsi united with the tibiæ: *body* depressed or linear.

STIRPS 1.—*Anus* without setæ: *tarsi* of the four posterior feet distinctly biarticulate: *antennæ* four-jointed.

Genus 286. NAUCORIS. *Geoff., Fabr., Oliv., Latr., Leach.* NEPA. *Linn., De Geer.*

Four posterior feet ciliated, formed for swimming: *antennæ* inserted beneath the eyes: *body* ovate, much depressed.
Sp. 1. *Nau. cimicoides.*
Inhabits ponds.

STIRPS 2.—*Anus* furnished with two setæ: *tarsi* of the four posterior feet one-jointed: *antennæ* three-jointed.

Genus 287. NEPA. *Linn., De Geer, Fabr., Oliv., Lam., Latr., Leach.* HEPA. *Geoff.*

Rostrum perpendicularly inflected: *body* oval: *anterior thighs* thick: *four hinder feet* not elongate-filiform.
Sp. 1. *Nepa cinerea.* Dark grayish-black. (*Pl. 5. fig. 4.*)
Nepa cinerea. *Linn., Fabr., Latr., Leach.*
Inhabits ditches: is very common.

Genus 288. RANATRA. *Latr., Fabr., Schellenberg, Leach.* NEPA. *Linn., De Geer, Oliv., Lam.* HEPA. *Geoff.*

Rostrum porrected: *body* linear: *four hinder feet* very long, filiform: *thighs of anterior feet* elongate.
Sp. 1. *Ran. linearis.* Grayish brown.
Ranatra linearis. *Fabr., Latr., Schell., Leach.* Nepa linearis. *Linn.*
Inhabits the ditches and ponds of Europe. It is very local in this country. It may occasionally be found near London in ponds on Epping Forest, Copenhagen Fields, and near Hammersmith.

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Fam. VII. Notonectidæ. *Leach.*

"Linné and all his predecessors comprehended the species under the generic appellation *Notonecta*. The accurate Geoffroy was the first who separated *Notonecta* into two genera, which have been adopted by most succeeding writers, excepting Linné, who in his last edition of the *Systema Naturæ* has merely given the synonyms of that author, without taking the least notice of the important characters which induced him to separate them."

De Geer confounded the animals of this tribe with *Nepa* and *Naucoris*, whilst Latreille and Olivier placed them in a division of their family *Hydrocorisæ*. In the *Edinburgh Encyclopædia* Dr. Leach separated them from the *Hydrocorisæ*, and placed them in a particular tribe, named in that work *Notonectides*, and in the twelfth volume of the *Transactions of the Linnean Society* he has given an excellent paper, in which are described at large the whole of the British species hitherto discovered, which consist of four very natural genera.

Stirps 1.—*Body* cylindrical oval, or nearly square: *tarsi* with two articulations. (*Scutellum large.*)

"All the insects of this family swim on their back, moving by means of their long hinder legs, which resemble oars; whence they have been aptly named *boat-flies*."

Genus 289. NOTONECTA *of authors.*

Body oval and cylindric: *antennæ* with the third articulation slenderer than the second: *anterior tarsi* with the first articulation long: *claws* of the hinder feet very minute.

Besides the above characters, the following will be useful, in order to enable the young entomologist to distinguish this genus from Plea, from which it was first separated by that close examiner of nature Dr. Leach.

The *thorax* is hexagonal; the anterior part is much attenuated, and the hinder margin is straight: the head is narrower than the broadest part of the thorax: the eyes are oblong, and converge a little behind: the *hinder legs* are much ciliated, and the *claws* are so minute as to be discovered with great difficulty: the tips of the *elytra* are notched.

Sp. 1. *Not. furcata.* Elytra black, with two grayish spots at the base, and two larger ones at the posterior part.

Notonecta furcata. *Fabr., Oliv., Leach.*

Var. β. Elytra with ferrugineous spots.

Inhabits ponds and ditches in England and Scotland.

Sp. 2. *Not. maculata.* Elytra dark brown and varied with spots: back ferrugineous with a darker fascia.

Notonecta maculata. *Oliv., Leach.* Notonecta glauca. Var. β. *Latr.*

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Inhabits England, near Bristol, Plymouth, and Exeter.
Elytra with the apex of a palish black.

Sp. 3. *Not. glauca.* Elytra grayish, the margin with minute blackish spots: back black, the apex pale brownish. (*Pl.* 5. *fig.* 3.)
Notonecta glauca *of authors.*
Inhabits Britain in almost every pond.

Genus 290. PLEA. *Leach, Trans. of Linn. Soc.* vol. xii.

Body of a squarish oval: *antennæ* with the third and remainder of the joints largest: *anterior tarsi* with the articulations nearly equal: *claws* on the hinder feet large.

The thorax is obscurely hexagonal with the hinder margin prominent and rounded, the head as broad as the broadest part of the thorax: the eyes are rather oblong, without the least tendency to converge behind: the hinder pair of legs not more ciliated than the others, but are terminated by very strong and distinct claws: tips of the elytra acuminated and entire.

Sp. 1. *Not. minutissima.* Gray with a brownish line in the front: thorax and elytra deeply punctured.
Notonecta cinerea, anelytra. *Geoff. Ins. Par.* i. 477. 2. Notonecta minutissima. *Fourc., Latr., Oliv., Fabr.* Plea minutissima. *Leach.*
Length of the body 1½ lin.
Inhabits ponds and stagnant waters near London in profusion.

"This species has been considered by Geoffroy, Fabricius and Olivier, as *Notonecta minutissima* of Linné, which reference undoubtedly belongs to the following species; viz. to *Sigara minutissima.*"

"Geoffroy has described the larvæ, never having seen the perfect insect."

STIRPS 2.—*Body* roundish and depressed: *tarsi,* the anterior with one articulation; the hinder with two; base and margin of the elytra only channelled.

Genus 291. SIGARA. *Leach, Trans. Linn. Soc.* vol. xii.

Scutellum distinct: *thorax* divided by a transverse line: *body* ovate, the posterior part acuminated.

Sp. 1. *Sig. minutissima.* Above cinereous: elytra brownish with very faint spots; the under part and feet yellowish.
Notonecta minutissima. *Linné.* Sigara minutissima. *Leach.*
Inhabits rivers and running waters in England, Ireland, and Scotland.
Length of the body 1 lin.

Genus 292. CORIXA. *Geoffroy, Leach.*

Scutellum none: *thorax* transverse, the posterior part produced: *body* long, the anterior and posterior part rounded.

"The thorax is more or less produced behind in all the species of this genus, but is not evident in the first division of this genus until

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the elytra have been elevated. The front, the under parts of the body, and the legs, in all the British species are yellowish."

* *Elytra to the apex gradually decreasing and ending in a point.*

The channel on the anterior margin of the elytra in this division is uninterrupted, and gradually disappears before it reaches to the extremity of the elytra.

Sp. 1. *Cor. coleoptrata.* Thorax reddish-gray: elytra palish yellow, with longitudinal rows of black spots.

Sigara coleoptrata. Elytra wholly coriaceous and brown: the exterior margin yellow. *Fabr. Syst. Rhyng.* 105. 4.

Inhabits ponds and ditches near Norwich. Dr. Leach has observed, that although the character by Fabricius does not accord with that given above, yet as he drew his description from a museum specimen (which generally assumes the colour he mentions) the Doctor has given his synonym without any hesitation; but this insect is distinct from the *Sigara coleoptrata* of Panzer, which is figured with a scutellum, and most probably belongs to the genus *Sigara* as mentioned above.

** *Elytra at the apex rather rounded.*

The channel in the fore part of the elytra, at about two-thirds from its commencement, is interrupted by an oblique, transverse, elevated line, and it terminates abruptly before it reaches to the apex of the elytron, and then it leaves the margin inclining a little inwards or backwards.

a. *Elytra and thorax rough.*

Sp. 2. *Cor. striata.* Thorax and elytra brown with yellow lines and transversely striated: back black, sides pale yellow.

Notonecta striata. *Linn.* Corixa striata. *Leach.*

Inhabits stagnant waters.

Sp. 3. *Cor. stagnalis.* Thorax with numerous transverse yellow lines: elytra brown, besprinkled with minute yellowish dots: anterior part of the margin yellowish; posterior with yellowish lines; back brownish black.

Corixa stagnalis. *Leach, Tr. Linn. Soc.* xii.

Inhabits ponds and stagnant waters.

This species is about half the size of *C. striata.*

Sp. 4. *Cor. fossarum.* Brown: thorax with six transverse yellow lines: elytra brown, with minute yellowish dots, the anterior part yellowish, towards the base of the posterior part yellowish lines: back yellowish. Smaller than *C. stagnalis.*

Inhabits ponds and ditches.

Sp. 5. *Cor. lateralis.* White: thorax with seven black lines: elytra with minute black spots, anterior margin immaculate.

C. lateralis. *Leach, Trans. Linn. Soc.* xii.

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This species is considerably smaller than *C. fossarum*, back black, sides yellow.

Sp. 6. *Cor. dorsalis.* Thorax with six transverse black lines on the margin: elytra black and spotted, the anterior margin immaculate.

C. dorsalis. *Leach, Trans. Linn. Soc.* xii.

Rather larger than *C. stagnalis.* Back yellow.

b. *Thorax and elytra smooth and shining.*

Sp. 7. *Cor. Geoffroyi.* Yellow: thorax with numerous transverse black lines: elytra black with minute spots: back wholly black: apex yellowish.

La Corise. *Geoff. Hist. Nat. des Insect.* i. P. 478. *pl.* 9. *fig.* 7. Sigara striata. *Panz. Faun. Ins. Germ. Ins.* 50. 23. Corixa Geoffroyi. *Leach.*

Length of the body half an inch.

Inhabits stagnant waters, and is very common.

"All authors have considered this species as *Notonecta striata* of Linné, although it will not agree with his character. It is figured by Geoffroy and Panzer, and is of the former author the species serving as the type of the genus *Corixa.*"

Sp. 8. *Cor. affinis.* Yellow: thorax with numerous transverse black lines: elytra black with minute dots: back wholly black, sides dentated and yellow.

Cor. affinis. *Leach, Trans. Linn. Soc.* xii.

Inhabits ponds near Plymouth, but is rare. But half the size of *C. Geoffroyi.*

Order VIII. OMOPTERA. *Leach.*

Order Hemiptera. *Linn., Cuvier, Lamarck.*

Class Rhyngota. *Fabr.*

Order Hemiptera. Section 2. *Homoptera.* Latr.

Characters of the Order.

Rostrum attached to the inferior part of the head: *elytra* coriaceous or membranaceous throughout; suture straight: *thorax* composed of two segments, the second as long or longer than the first: *ocelli* three. *Metamorphosis* semicomplete, or incomplete.

Fam. I. Cicadiadæ. *Leach.*

Cicadariæ I. *Latreille.*

Antennæ composed of six distinct joints: *ocelli* or *little eyes* three: *tarsi* with three joints.

Genus 293. CICADA. *Lamarck, Geoff., Linn., De Geer, Latr.*

Tettigonia. *Fabr.*

Thighs of the anterior feet thick, dentate.

Sp. 1. anglica? (*Pl.* 5. *fig.* 2. *natural size.*)

The only species known to inhabit this country was lately discovered by Mr. Daniel Bydder, near the New Forest in Hampshire.

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Fam. II. Cereopidæ. *Leach.*

Cicadariæ II. *Latreille.*

Antennæ three-jointed: *ocelli* two: *tarsi* with three joints.

Stirps 1.—*Antennæ* not inserted in the internal sinus of the eyes; the two first joints conjoined shorter than the head.

Genus 294. FLATA. *Fabr., Leach.* Fulgora. *Latr.*

Front as if truncated, vertical, not rostrated: *eyes* globular: *elytra* very broad; the external margin very much dilated: *body* broad, triangular.

Sp. 1. *Fla. reticulata.*

Inhabits Europe, and is common in this country in hedges during the summer months.

Genus 295. ISSUS. *Fabr., Leach.* Fulgora. *Latr., Oliv.* Cicada. *Villers.*

Front as if truncated, not rostrated, vertical: *elytra* at their external base very much dilated, with the apex narrower: *body* short, deltoid: *eyes* globular.

Sp. 1. *Iss. coleoptratus.*

Inhabits hedges.

Genus 296. CIXIUS. *Leach.* Fulgora. *Latr.* Flata. *Fabr.*

Front as if truncated, not rostrated, vertical: *elytra* with the external margin nearly straight or scarcely arcuate: *body* elongate, quadrate: *eyes* globular.

Sp. 1. *Cix. nervosus.*

Flata nervosa. *Fabr.*

Inhabits hedges.

Stirps 2.—*Antennæ* inserted in the internal sinus of the eyes, the two first joints as long or longer than the head.

Genus 297. ASIRACA. *Latr., Leach.* Delphax. *Fabr.*

Antennæ as long or longer than the thorax, the first joint very long, compressed, angulate.

Sp. 1. *Asi. clavicornis.* Body brown or obscure brown variegated: apex of the four anterior tibiæ white: elytra semihyaline: apex with a fuscous band; nerves spotted with fuscous.

Delphax clavicornis. *Fabr.* Asiraca clavicornis. *Latr., Leach.*

Inhabits France and England in grassy places.

Stirps 3.—*Antennæ* inserted between the eyes; *thorax* not transverse; hinder margin more or less prominent.

Genus 298. CERCOPIS. *Fabr., Schrank, Latr., Leach.* Cicada, *Linn.* Tettigonia. *Oliv.*

Antennæ inserted on the frontlet, the second longer than the first joint, the third joint short-conic; *thorax* not dilated.

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Sp. 1. *Cer. sanguinolenta.* Black, shining; each wing-case with a spot at the base, one in the middle, and a flexuous band at the apex blood red. (*Pl. 5. fig. 1.*)

Cicada sanguinolenta. *Linn.* Cercopis sanguinolenta. *Fabr., Leach.*
Inhabits France, Germany, and England in the woods of Kent.

Genus 299. LEDRA. *Fabr., Latr., Leach.* CICADA. *Linn., Geoff.* MEMBRACIS. *Oliv., Lamarck, Schrank.*

Antennæ inserted in the frontlet, the two first joints nearly equally long; the third elongate-conic: *thorax* dilated behind into an auricle.

Sp. 1. *Led. aurata.*
Inhabits the oak and various trees in woods.

Genus 300. MEMBRACIS. *Latr., Fabr., Leach.* CICADA. *Linn.*

Antennæ inserted in the frontlet; the two first joints nearly equally long, the third elongate-conic: *thorax* dilated behind.

Sp. 1. *Mem. cornutus.* Brownish.
Cicada cornuta. *Linn.* Membracis cornuta. *Latr., Leach.*
Inhabits woods and hedges.

STIRPS 4.—*Antennæ* inserted between the eyes: *thorax* transverse, hinder margin straight.

Genus 301. IASSUS. *Fabr., Leach.* TETTIGONIA. *Latr., Oliv., Lamarck.*

Front broad, not longer than broad, on each side above the insertion of the antennæ produced into an angle.

Sp. 1. *Iass. Lanio.* Fabr.
Inhabits England and other parts of Europe.

Genus 302. TETTIGONIA. *Oliv., Lamarck.* CICADA. *Linn., Fabr., Latr., Leach.*

Front elongate-quadrate, the apex truncate, convex, thickened.

Sp. 1. *Tet. viridis.*
Inhabits moist places.

Fam. III. PSYLLIDÆ. *Latreille, Leach.*

Tarsi with two joints distinct: *antennæ* with ten or eleven joints, the last with two setæ: *legs* formed for leaping. Both sexes with wings.

Genus 303. PSYLLA. *Geoff., Oliv., Lam., Latr., Leach.* CHERMES. *Linn., De Geer, Fabr.*

Antennæ filiform or slightly setaceous, as long as the body: *thorax* with the anterior margin arcuate.

Sp. 1. *Psyl. Alni.* Green-yellowish; anterior segment of the thorax, squamula of the elytra, and nervures, green.
Chermes Betulæ Alni. *Linn.* Chermes Alni. *Fabr.* Psylla Alni. *Latr., Leach.*
Inhabits the alder.

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Genus 304. LIVIA. *Latr., Leach.* DIRAPHIA. *Illiger.*

Antennæ shorter than the thorax, the base much thickened even to the middle: *thorax* with the anterior segment transverse, straight.

Sp. 1. *Liv. juncorum.* (*Pl.* 5. *fig.* 11.) *magnified: the line beneath exhibits the natural size.*)

Livia Juncorum. *Latr.*

Inhabits Junci.

Fam. IV. APHIDÆ. *Leach.*

APHIDII. *Latreille.*

Tarsi two-jointed, the first joint very short: *rostrum* in both sexes: *antennæ* with six, seven, or eight joints: females generally apterous: *tarsi* with the last joint vesiculous.

STIRPS 1.—*Antennæ* eight-jointed: *rostrum* minute and horizontal with indistinct joints: *head* elongate-quadrate.

Genus 305. THRIPS. *Linn., Geoff., Latr., Lam., Oliv., Leach.*

Elytra and wings horizontal and linear.

Sp. 1. *Thr. Physapus.* Black, hairy: antennæ, tibiæ, and tarsi pale: middle of the tibiæ pale brown; elytra and wings white. (*Pl.* 5. *fig.* 12. *magnified: the line beneath shows the natural size.*)

Inhabits the blossoms of various plants.

STIRPS 2.—*Antennæ* seven-jointed: *elytra* larger than the wings: *rostrum* subperpendicular, with three very distinct joints: *head* transverse.

Genus 306. APHIS. *Linn., Fabr., Latr., Oliv., Lam., Leach.*

Antennæ setaceous or filiform, seven-jointed: *elytra* larger than the wings; elongate triangulate: *abdomen* towards the apex generally tuberculated or horned: *eyes* entire. (*Pl.* 5. *fig.* 9.)

The animals of this genus are very numerous, and are found on almost every plant. The French call them *Pucerons*, the English Plant-lice. The species require examination; the plant on which they are found should be noticed, as it will afford specific names. The females are generally apterous.

Genus 307. ERIOSOMA. *Leach's MSS.*

Abdomen without tubercles or horns: *antennæ* short and filiform: *body* tomentose.

"The *Eriosomata* form what are called improperly Galls on the stalks of trees near their joints, and knobs, which are in fact excrescences caused by the efforts of nature to repair the damage done to the old trees by the perforation of those insects, whose bodies are covered with down." *Leach's MSS.*

Sp. 1. *Er. Mali.*

Aphis lanigera *of authors.*

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Genus 308. ALEYRODES. *Latr., Lam., Leach.* TINEA. *Linn.* PHALÆNA. *Geoff.*

Antennæ filiform, short, six-jointed: *elytra* and wings equal in size: *body* mealy: *eyes* two, each divided into two.

Sp. 1. *Al. Chelidonii.* Body yellowish, or rosy powdered with white: eyes black; each elytron with a puncture and spot of black.

Inhabits hedges and woods.

Fam. V. COCCIDÆ. *Leach.*

GALINSECTA. *Latreille.*

Tarsi with one joint and one nail: *rostrum* in the female: *wings* in the male, but no elytra: *female* apterous.

Genus 309. COCCUS. *Linn., Geoff., Fabr., Oliv., Latr., Lam., Leach.*

Antennæ of the female eleven-jointed: *abdomen* of the males with two very long setæ at the apex.

Sp. 1. *Coc. Cacti.*

Coccus Cacti. *Linn., De Geer, Fabr., Latr., Leach.*

Inhabits fruit-trees.

This genus requires a minute investigation, which should be conducted by some one possessing a great share of patience, and having a competent knowledge of entomology.

Order IX. APTERA. *Leach.*

Order APTERA. *Linn., Lamarck.*

Order SUCTORIA. *Latr.*

Characters of the Order.

Body somewhat ovate, compressed, covered with a coriaceous skin, and composed of several segments: *trunk* short, consisting of three leg-bearing joints: *head* small, compressed, rounded above, and truncate before: *eyes* minute, orbicular, lateral: *antennæ* lamelliform, small, ciliated with spinules, one-jointed at their base, inserted in two excavations behind the eyes: *palpi* filiform (composed of four rounded joints) scarcely longer than the head, porrect, generally resting on the rostrum: *legs* strong, and formed for jumping, especially the hinder ones: *coxæ* and thighs large, compressed: *tarsi* elongate, cylindric, composed of five simple joints, the last articulation furnished with two long, acute, slender nails.

LARVA without feet.

PUPA folliculate.

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Genus 310. PULEX *of authors.*

Sp. 1. *Pul. irritans.* Body brunneous, sometimes inclined to rust colour.

The common bed-flea is found throughout Europe.

"Notwithstanding the inconveniences attending this little insect, there is something pleasing in the appearance of the flea. Its motions are elegant, and all its postures indicate agility. The shell with which it is enveloped is in a state of perpetual cleanliness, while the muscular power which it is capable of exerting is so extraordinary, as to excite our wonder at so much strength confined and concentrated within so small a space; this species being able to spring, on the most moderate computation, to the distance of at least two hundred times its own length, and drag a weight eight times heavier than itself. It has sometimes become a favourite with ladies, who have pleased themselves with keeping, taming, and feeding it. A golden chain has been made for it with a lock and key; and being kept in a box with wool, in a warm place, and fed daily, it has been known to live for six years.

"The *Pulices* of birds and of mammalia ought to be most carefully examined. There are a vast number of species which have been confounded with *P. irritans.*"

Order X. LEPIDOPTERA.

Order Lepidoptera. *Linn., Cuv., Lam., Latr., Leach.*

Class Glossata. *Fabr.*

Characters of the Order.

Wings four, covered with scales: *tongue* spiral, filiform. Linné divided this order into three genera; viz. *Papilio* (butterfly), *Sphinx* (hawk-moth), and *Phalæna* (moth), which were characterized by the form of their antennæ; and these divisions form the three great sections of Latreille, as follow:

Section I. *DIURNA.*

Wings four; all, or at least the superior ones, erect when the insect is at rest: *antennæ* with their points thicker or capitate; in a very few somewhat setaceous, with the extreme apex hooked. The insects of this section, which constituted the Linnean genus *Papilio*, all fly by day. *Caterpillars* with sixteen feet. *Chrysalis* naked, and generally angulated.

Fam. I. Papilionidæ. *Leach.*

Papilionides. *Latreille.*

Hinder tibiæ with heels only at their extremities: *wings* all elevated when at rest.

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In this section I shall enumerate the whole of the British species.

STIRPS 1.—*Caterpillar* elongate, cylindric: *chrysalis* elongate, angular: *tarsi of the imago* with distinct nails.

Genus 311. PAPILIO. *Fabr., Latr., Leach.*

Antennæ, at their points, furnished with a conic-ovate or lengthened-ovate, somewhat arcuate, club: *palpi* very short, pressed close to the face, scarcely reaching the clypeus; the two first joints of equal length; the third minute, and nearly obsolete: *feet* in both sexes alike, all being formed for walking, and furnished with distinct but simple claws: *anterior* wings generally somewhat falcate; hinder ones often tailed; the internal margin excised or folded to admit of free play to the abdomen.

The caterpillar is tentaculated, fleshy and furcate. The chrysalis angulated, with two processes before; it fastens itself by a transverse thread.

The species of this genus, which constitutes the most beautiful part of the creation, are found chiefly in the warmer regions, very few occurring in the more temperate parts of the world. Their flight is extremely rapid.

Sp. 1. *Pap. Machaon.* Black and yellow; hinder wings tailed; edges of the wings black, with yellow crescents; the tips of the hinder ones with a red spot at their inferior tips. (*Pl. 5. fig. 1.*)

Papilio Machaon. *Linn., Babr., Haworth.*

Inhabits Europe; the larva feeds on umbelliferous plants.

In England it is called the Swallow-tailed butterfly; it is very local, but occurs near Bristol, Beverley in Yorkshire, and has been taken plentifully in Hampshire near the New Forest. It is the most superb of all the British species of this family. The caterpillar is green, banded with black, marked by a row of red spots. It changes into the chrysalis state in July; and the fly is found in August. There are two broods; the first appears in May, having lain in the pupa state all the winter.

Papilio Podalirius of Linné, which belongs to this genus, has been introduced into the British Fauna on very dubious authority. But Mr. Haworth is yet in hopes of receiving indigenous specimens from Yorkshire.

Genus 312. GONEPTERYX. *Leach.* COLIAS. *Fabr., Latr.* PIERIS. *Schrank.*

Antennæ short, gradually thickening into an obconic head: *palpi* short, much compressed; the last joint very short: *feet* alike in both sexes, all with a bifid or unidentate nail: *wings* angulated, large, the hinder ones grooved to receive the abdomen: *chrysalis* angulated with a thread round its middle.

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Sp. 1. *Gon. Rhamni.* Wings of the male yellow, of the female whitish; with a fulvous spot on each.
Inhabits woods in the spring and autumn. Flight slow.

Genus 313. COLIAS. *Fabr., Latr., Leach.* PAPILIO. *Linné, Haworth.* PIERIS. *Schrank.*

Antennæ short, gradually thickening into an obconic head: *palpi* much compressed; the last joint very short: *feet* alike in both sexes, all with bifid or unidentate nails: *wings* anterior, somewhat trigonate; hinder rounded, with a groove to receive the abdomen: *chrysalis* angulated, fastened by a transverse thread.

Sp. 1. *Col. Hyale* (clouded yellow butterfly).
Inhabits Europe. Occurs in England once in three years, some seasons only locally, at others in the greatest profusion in every part of the country. There is a pale coloured variety of each sex, which have been considered as distinct species.

Sp. 2. *Col. Edusa.*

Genus 314. PONTIA. *Fabr., Leach.* PIERIS. *Schrank, Latr.*

Antennæ elongate, with an abrupt, obconic, compressed head: *palpi* slender, somewhat cylindric; the last joint as long as the preceding: *wings* not very narrow, or much lengthened; hinder ones grooved to admit the abdomen, but not tailed: *feet* alike in both sexes; claws unidentate or bifid: *chrysalis* angulated, fastened by a transverse thread.

"* *Anterior wings somewhat trigonate; hinder ones somewhat orbiculate.*"

Sp. 1. *Pont. Cratægi* (black-veined white). Wings white, with a faint tinge of yellowish and black nervures.
Inhabits Europe. In England it is found in the woods near London; the larva feeds on the white-thorn.

Sp. 2. *Pont. Brassica* (large cabbage butterfly).
Inhabits Europe; the larva on the cabbage.

Sp. 3. *Pont. Rapæ* (small cabbage butterfly).
Inhabits gardens.

Sp. 4. *Pont. Napi* (green-veined white).
Inhabits gardens and woods.

Sp. 5. *Pont. Cardamines* (orange tip butterfly).
Inhabits path-ways in woods.

Sp. 6. *Pont. Daplidice* (Bath white). This has long been doubted whether a native of this country; but that successful and industrious entomologist Mr. Stephens has sufficiently proved the fact, by taking a specimen at Dover in July 1818.

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"** *Wings somewhat oval.*"

Sp. 7. *Pont. Sinapis* (wood white). Wings white, with blackish tips.
Inhabits woods.

Genus 315. MELITÆA. *Fabr., Leach.* ARGYNNIS. *Latr.* PAPILIO. *Linn., Haworth.*

Antennæ terminated by a short club: *palpi* very hairy, divaricating, with the last joint acicular, half the length of the preceding joint: *hinder wings* orbicular: *anterior feet* very short in both sexes; *tarsi* with double nails.
Caterpillar pubescent, with fleshy tubercles.
Chrysalis suspended by the tail.

Sp. 1. *Mel. Euphrosyne* (pearly border). Wings indented, tawny, with black spots; nine silvery spots on the under side.
Inhabits waste grounds and heaths.

Sp. 2. *Mel. Silene* (pearly border likeness).
Inhabits woods and waste ground.

Sp. 3. *Mel. Cinxia* (Glanville).
Inhabits Europe: very rare in Britain.

Sp. 4. *Mel. Artemis* (greasy).
Inhabits Europe: seldom taken near London, but is common near Norwich.

Sp. 5. *Mel. Dictynna* (heath).
Inhabits heaths and marshes.

Sp. 6. *Mel. Lucina* (Duke of Burgundy).
Inhabits the borders of woods and hedges, but is local.

Genus 316. ARGYNNIS. *Fabr., Latr., Leach.*

Antennæ terminated by a short club: *palpi* divaricating abruptly, terminated with a minute, slender, acicular, very short joint; the second joint broad, hairy: *hinder wing* orbicular: *anterior feet* very short in both sexes: *tarsi* with double nails.
Chrysalis suspended by the tail.
Caterpillars spiny.

Sp. 1. *Arg. Lathonia* (Queen of Spain fritillary).
Inhabits Europe: is very rare in Britain.

Sp. 2. *Arg. Aglaia* (dark green fritillary).
Inhabits Europe in woods and lanes.

Sp. 3. *Arg. Adippe* (high brown fritillary).
Inhabits heaths and the borders of woods.

Sp. 1. *Arg. Paphia* (silver-washed fritillary).
Inhabits the borders of woods, and the New Forest in Hampshire.

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Genus 317. VANESSA. *Fabr., Latr., Leach.* PAPILIO. *Linn., Haworth.*

Antennæ terminated with an abrupt short club: *palpi* contiguous, and terminated gradually in a point; the two combined bearing some resemblance to a rostrum: *anterior pair of feet* in both sexes short and very hairy: *tarsi* with double nails.

Chrysalis suspended by its tail.

Caterpillar spiny.

Sp. 1. *Van. Atalanta* (red admirable). Wings indented, black with white spots; a red fascia in the upper wings, and another on the margin of the under wings.

Inhabits Europe: the larva feeds on the nettle.

Sp. 2. *Van. Cardui* (painted lady). Wings orange, indented; variegated with black and white spots: four ocelli on the under side of the posterior wings.

Inhabits Europe: the larva feeds on the thistle.

Sp. 3. *Van. Antiopa* (Camberwell beauty). Wings angulated and black, the borders whitish.

Cynthia Cardui. *Fabr., Leach.*

Inhabits Europe. This species has become exceedingly rare in this country. Mr. Haworth has observed (in the first part of his *Lepidoptera Britannica*) "There is something very extraordinary in the periodical but irregular appearance of this species, *Papilio Edusa* (*Colias Hyale* of this work) and *Pap. Cardui*. They are plentiful all over the kingdom in some years; after which *Antiopa* in particular will not be seen by any one for eight, ten, or more years, and then appear as plentiful as before. To suppose they come from the Continent, is an idle conjecture; because the English specimens are easily distinguished from all others by the superior whiteness of their borders. Perhaps their eggs, in this climate, like the seeds of some vegetables, may occasionally lie dormant for several seasons, and not hatch until some extraordinary but undiscovered coincidence awake them into active life."

Sp. 4. *Van. Io* (peacock).

Inhabits nettles.

Sp. 5. *Van. polychloros* (large tortoise-shell).

Inhabits Europe: the larva on the elm.

Sp. 6. *Van. Urticæ* (small tortoise-shell).

Inhabits Europe: the larva feeds on nettles.

Sp. 7. *Van. C. album* (comma).

Inhabits woods: the larva feeds on the nettle, hop, willow, and the currant.

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Genus 318. APATURA. *Fabr., Leach.* NYMPHALIS. *Latr.* PAPILIO. *Linn., Haworth.*

Antennæ with an elongate-obconic thickened club: *palpi* with the second joint not much compressed, the anterior margin broad: *anterior pair of feet* very short in both sexes.

Sp. 1. *Apa. Iris* (purple emperor). Wings indented, brownish, shining, with blue or purple; on both surfaces a whitish interrupted fascia and a single ocellus on the under wing.

The following account of this interesting and elegant insect is given by Mr. Haworth.

"In the month of July he makes his appearance in the winged state, and invariably fixes his throne upon the summit of a lofty oak, from the utmost sprigs of which, on sunny days, he performs his aërial excursions; and in these ascends to a much greater elevation than any other insect I have ever seen, sometimes mounting higher than the eye can follow, especially if he happens to quarrel with another emperor, the monarch of some neighbouring oak: they never meet without a battle, flying upwards all the while and combating with each other as much as possible, after which they will frequently return again to the identical sprigs from whence they ascended. The wings of this fine species are of a stronger texture than those of any other in Britain, and more calculated for that gay and powerful flight which is so much admired by entomologists. The Purple Emperor commences his aërial movements from ten to twelve o'clock in the morning, but does not perform his loftiest flights till noon, decreasing them after this hour until he quite ceases to fly about four in the afternoon; thus emulating the motions of that source of all his strength, the sun. The females, like those of many other species, are very rarely seen on the wing: the reason of which is both interesting and but little known. It is their being destitute of a certain *spiral socket* which the males possess, near the base of the main tendon of their upper wings; which socket receives and works a strong elastic spring arising from the base of the under wings, thereby enabling them to perform a stronger, longer, and more easy flight than it is possible for the females to do."——

"The males usually fly very high, and are only to be taken by a bag-net fixed to the end of a rod twenty or thirty feet long. There have been instances, though very rare, of their settling on the ground near puddles of water, and being taken there. When the Purple Emperor is within reach, no fly is more easily taken than he; for he is so very bold and fearless that he will not move from his settling place until you quite push him off: you may even tip the ends of his wings, and be suffered to strike again."

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Genus 319. LIMENITIS. *Fabr., Leach.* NYMPHALIS. *Latr.*

Antennæ gradually clubbed; club slender, round obconic: *palpi* as long as the head, with the second joint not very much compressed; the anterior margin not remarkably broader: *anterior pair of feet* in both sexes very short and spurious: *wings* not much longer than broad: *Four hinder feet* with double nails.

Larva elongate.

Chrysalis suspended by the tail.

Sp. 1. *Lim. Camilla* (white admirable).

Inhabits Europe. This is considered a rare insect in Britain, but I have observed them in certain years in Bedstile-wood near Finchley, and Birch-wood in Kent, in tolerable abundance.

Genus 320. HIPPARCHIA. *Fabr., Leach.* MANIOLA. *Schrank.* SATYRUS. *Latr.* PAPILIO. *Linn., Haworth.*

Antennæ with a slender somewhat fuciform, or trigonate-orbicular club: *palpi* meeting above the tongue, with the second joint very much compressed, and much longer than the first: *anterior pair of legs* shorter than the rest, and often very hairy; feet of the other legs with double nails: *hinder wings* somewhat orbicular or orbiculate-triangulate, with the external margin excavated to receive the abdomen; the middle cell closed behind, from which part the nervures radiate; the other margin entire, or with acute or obtuse indentations.

Caterpillar downy, with a globular head somewhat compressed in front; the abdomen bimucronate behind.

Chrysalis angulated, with the front bimucromate suspended by the tail. *Leach's Zool. Misc.* vol. i. p. 27.

Sp. 1. *Hipp. Galathea* (marbled).

Inhabits woods and fields.

Sp. 2. *Hipp. Hyperanthus* (the ringlet).

Inhabits woods and fields.

Sp. 3. *Hipp. Pamphilus* (small heath).

Inhabits heaths.

Sp. 4. *Hipp. blandina* (Scotch Argus).

Inhabits the isles of Bute and Arran.

Sp. 5. *Hipp. Pilosella* (small meadow brown).

Inhabits fields and the borders of woods.

Sp. 6. *Hipp. Janira* (meadow brown).

Papilio Jurtina. *Haworth, Linn.*

Inhabits fields and lanes.

Sp. 7. *Hipp. Megæra* (gate-keeper).

Inhabits fields and the borders of woods.

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Sp. 8. *Hipp. Ægeria* (speckled wood, or wood Argus).
Inhabits the borders of woods and fields.

Sp. 9. *Hipp. Semele* (grayling, or rock underwing).
Inhabits heaths, commons, and rocky wastes.

STIRPS 2.—*Larvæ* oval, depressed: *pupa* short, contracted, obtuse at both extremities: *tarsi* with very small nails.

Genus 321. THECLA. *Fabr., Leach.* POLYOMMATUS. *Latr.*
Feet in both sexes all alike: *nails* scarcely produced beyond the pulvilli, which are large: *antennæ* gradually clubbed; the club elongate, cylindric oval: *hinder wings* tailed.

* *Antennæ gradually clavated.*

Sp. 1. *The. Betulæ* (brown hair streak.)
Inhabits the borders of woods.

Sp. 2. *The. Pruni* (black hair streak).
Inhabits the borders of woods.

Sp. 3. *The. Quercus* (purple hair streak).
Inhabits oak woods, flying on the highest branches of the trees.

** *Antennæ abruptly clavated.*

Sp. 4. *The. Rubi* (green underside, or hair streak).
Inhabits the skirts of woods.

Genus 322. LYCÆNA. *Fabr., Leach.* POLYOMMATUS. *Latr.*
Legs alike in both sexes: *nails* projecting beyond the pulvilli, which are small: *antennæ* with an abrupt club, somewhat ovate, compressed, or spoon-shaped.

* *Hinder wings more or less tailed.*

Sp. 1. *Lyc. dispar* (large copper).
Papilio Hypothöe. *Donovan.*
Inhabits the fens of Cambridgeshire, and has been observed near Aberdeen in Scotland.

Sp. 2. *Lyc. Chryseis* (purple-edged copper).
Inhabits Europe: in Britain it is extremely rare.

Sp. 3. *Lyc. Virgaureæ* (scarce copper).
Inhabits Europe: very local in Britain. It is found in some parts of Huntingdonshire.

Sp. 4. *Lyc. Phlæas* (small copper).
Inhabits woods and heaths.

** *Hinder wings with the posterior margin entire.*

Sp. 5. *Lyc. Corydon* (chalk-hill blue).
Inhabits chalky districts.

Sp. 6. *Lyc. Adonis* (Clifden blue).
Inhabits chalky districts.

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Sp. 7. *Lyc. Dorylus* (common blue).
Inhabits heaths, commons, and lanes.

Sp. 8. *Lyc. Argus* (studded blue).
Inhabits fields and marshes.

Sp. 9. *Lyc. Idas* (black-spot brown).
Inhabits grassy places.

Sp. 10. *Lyc. Artaxerxes* (white-spot, brown or Scotch Argus).
Inhabits Arthur's Seat and the base of Kirk-hill, (one of the Pentland range near Edinburgh) in great plenty.

Sp. 11. *Lyc. Alsus* (Bedford blue).
Inhabits clover fields, &c.

Sp. 12. *Lyc. Argiolus* (azure blue).
Inhabits meadows.

Sp. 13. *Lyc. Cymon.*
Inhabits Europe: in Britain it is very local. It is found near Sherborne in Dorset in great abundance.

Fam. II. Hesperidæ. *Leach.*

Hesperides. *Latreille.*

Hinder tibiæ with two pair of heels or spurs, one pair at the middle, the other at the usual place: *antennæ* distinctly terminated with a club, hooked at their extremities: *palpi* short, thick, and squamose in front: *hinder wings* elevated when the insect is at rest.

Genus 323. HESPERIA. *Fabr., Cuv., Lam., Latr., Walck., Leach.* Papilio. *Linn., Haworth.*

Palpi with the third joint cylindric or cylindric-conic.

** Antennæ ending in an abrupt very acute hook.*

Sp. 1. *Hes. Comma* (pearl skipper).
Inhabits Europe: in England, near Lewes in Sussex.

Sp. 2. *Hes. Sylvanus* (wood skipper).
Inhabits the borders of woods.

*** Antennæ with their points arcuate.*

Sp. 3. *Hes. Tages* (dingy skipper).
Inhabits Europe, on dry heaths and banks.

Sp. 4. *Hes. Malvæ* (mallow skipper).
Inhabits dry banks.

**** Antennæ with straight points.*

Sp. 5. *Hes. Linea* (small skipper).
Inhabits the skirts of woods.

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Sp. 6. *Hes. Paniscus* (scarce skipper).
Inhabits meadows: very rare in Britain, excepting in some parts of Bedfordshire, where it is common.

Section II. *CREPUSCULARIA*. Latreille.

Wings horizontal in repose: *antennæ* prismatic or fusiform.

The insects of this section constitute the Linnean genus *Sphinx*, which has been divided by later writers into a number of genera.

Fam. III. SPHINGIDÆ. *Leach.*

SPHINGIDES. *Latreille.*

Palpi short, covered with very short close scales; the last joint tuberculiform and very short.

STIRPS 1. Anus not tufted.

Genus 324. SMERINTHUS. *Latr., Leach.* LAOTHÖE. *Fabr.*, SPHINX. *Linn., Haworth.* SPECTRUM. *Scopoli.*

Antennæ somewhat prismatic, serrated towards the middle, gradually thicker: *tongue* very short: *anterior wings* angulated: *palpi* contiguous.

Sp. 1. *Sme. ocellata* (eyed hawk-moth).
Inhabits Europe. The larva on the willow and poplar.

Sp. 2. *Sme. Tiliæ* (lime hawk-moth).
Inhabits the lime in the larva state.

Sp. 3. *Sme. Populi* (poplar hawk-moth).
Inhabits Europe. The larva feeds on the poplar.

Genus 325. SPHINX. *Linn., Fabr., Latr., Haworth, Leach.* SPECTRUM. *Scopoli.*

Palpi contiguous above the tongue: *tongue* long, very distinct, convoluted: *antennæ* prismatic, thicker towards their middle, in the males slightly ciliated.

OBS.—This genus has lately been divided into the following genera: I. DEILOPHILA, *Ochsheimer*. Sp. 1. Elpenor. 2. Porcellus. 3. Lineata. 4. Euphorbiæ. 5. Galii.—II. SPHINX, *Och.* Sp. 1. Pinastri. 2. Ligustri. ?. Convolvuli.—III. ACHERONTIA, *Och.* Sp. 1. Atropos.

Sp. 1. *Sph. Porcellus* (small elephant hawk-moth).
Inhabits Europe: is very rare in Britain.

Sp. 2. *Sph. Elpenor* (elephant hawk-moth).
Inhabits Europe. The larva feeds on the ladies bed-straw, and is found in the autumn in drills or ditches in marshes near London.

Sp. 3. *Sph. lineata* (silver line hawk-moth).
Inhabits Europe, and is exceeding rare in this country. *Sphinx lineata*

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of Donovan is distinct, and must be considered as a doubtful inhabitant of Britain.

Sp. 4. *Sph. Galii* (scarce spotted elephant).

Inhabits Europe: it is very rare in Britain. Two specimens have been taken in Cornwall near Penzance, one near Kingsbridge in Devon, and another near London.

Sp. 5. *Sph. Euphorbiæ* (spotted elephant).

Inhabits Europe: it is very rare in Britain. The larva has occurred near Plymouth.

Sp. 6. *Sph. Pinastri* (pine hawk-moth).

Inhabits Europe: it has been taken near London, and in Ravelston-wood near Edinburgh.

Sp. 7. *Sph. Convolvuli* (convolvulus hawk-moth).

Inhabits Europe: it has been taken near London, and in the most remote parts of Britain, even in the Shetland Islands, but does not make a regular appearance.

Sp. 8. *Sph. Ligustri* (privet hawk-moth).

Inhabits Europe. The larva feeds on the privet and ash in gardens and woods.

Sp. 9. *Sph. Atropos* (death's head hawk-moth).

Inhabits Europe. It must be considered as a valuable acquisition to the British cabinet; for although it occasionally occurs in the larva state, yet it is bred with extreme difficulty, and the fly when taken on the wing is generally very much mutilated and rubbed. The caterpillar feeds on the blossom of the potatoe.

STIRPS 2.—*Anus* tufted.

Genus 326. MACROGLOSSUM. *Scopoli, Leach.*

Palpi contiguous above the tongue: *tongue* very long, distinct and convoluted: *antennæ* prismatic, thicker towards their middle, (of the males ciliated); *wings* opaque.

Sp. 1. *Macro. Stellatarum* (humming-bird hawk-moth).

Inhabits gardens. The perfect insect feeds on the wing, extracting the honey of stellated plants.

Genus 327. SESIA. *Fabr., Leach.* MACROGLOSSA. *Ochsheimer.*

Palpi contiguous above the tongue: *tongue* very long; distinct, and convoluted: *antennæ* prismatic, thicker towards their middle (of the males ciliated): *wings* transparent.

Sp. 1. *Ses. bombyciformis* (narrow-bordered bee hawk-moth).

Inhabits open places in woods.

Sp. 2. *Ses. fusiformis* (broad-bordered bee hawk-moth).

Inhabits the borders of woods.

Fam. IV. ZYGÆNIDÆ. *Leach.*

ZYGÆNIDES. *Latreille.*

Palpi long, separate, covered with long scales or porrected hair.

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Genus 328. ÆGERIA. *Fabr., Leach.* SESIA. *Latr., Laspeyres.* TROCHILUM. *Scopoli.*

Antennæ fusiform: *abdomen* with the anus bearded.

Sp. 1. *Æg. apiformis* (bee hornet sphinx).
Inhabits Europe: is rare in Britain.

Sp. 2. *Æg. crabroniformis* (hornet sphinx).
Inhabits Europe: the larva feeds on the wood of the lime-tree.

There are several other species of this genus found in Britain, but their synonyms have never been satisfactorily ascertained.

Genus 329. ZYGÆNA *of authors.* SPHINX. *Linn.*

Antennæ abruptly flexuous-clavate: *palpi* cylindric-conic.

Sp. 1. *Zyg. Filipendulæ* (six-spot burnet).
Inhabits fields.

Genus 330. INO. *Leach.* PROCRIS. *Fabr., Latr.* ZYGÆNA. *Panz., Walckenaer.* SPHINX. *Linn.*

Antennæ of the male bipectinate, of the female simple: *palpi* short.

Sp. 1. *Ino Statices* (forester).
Inhabits the margins of woods in meadows.

Section III. *NOCTURNA.* Latreille.

Wings horizontal in repose: *antennæ* setaceous, gradually narrowing towards their extremities.

Fam. V. BOMBYCIDÆ. *Leach.*

BOMBYCITES. *Latreille.*

Antennæ with a single series of ciliæ (of the male at least serrated): *tongue* none: *palpi* two, short, cylindric, very hairy: *thorax* not crested: *wings* elongate undivided.

STIRPS 1.—*Wings* deflexed, long and narrow: *larvæ* naked: *pupa* with its segments laterally denticulated.

Genus 331. HEPIALUS. *Fabr., Latr., Leach.* PHALÆNA (Noctua). *Linné.*

Antennæ moniliform, shorter than the thorax: *palpi* very small, and very hairy: *wings* elliptic, equal, long.

Sp. 1. *Hep. Humuli* (ghost swift). Sp. 2. *Hep. Mappa* (map-winged swift). Sp. 3. *Hep. Hectus* (golden swift), &c.

Genus 332. COSSUS. *Fabr., Latr., Cuv., Leach.* PHALÆNA (BOMBYX). *Linné.*

Antennæ as long as the thorax, setaceous, furnished with a single series of short transverse obtuse teeth: *palpi* very distinct, thick cylindric, and squamous: *anterior wings* larger than the posterior.

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Sp. 1. *Cos. Ligniperda* (goat moth).
Phalæna (Bombyx) *Cossus*. Linné.
Inhabits Europe. The larva feeds on the internal parts of the willow, ash, and oak. The celebrated Lyonnett has immortalized himself by his laborious work on the anatomy of the larva and perfect insect. The caterpillar diffuses a scent, by which its residence may frequently be made known to those passing such trees as are much infested by it. It remains three years in this state, when it spins a strong web intermixed with particles of wood, and changes into the chrysalis, which it does in the month of May; and in June the perfect insect may be found sticking to the trunks of trees (generally willows) early in the morning and in the evening.

I once found the larva in an old oak near Norwood, in the month of January. Mr. Standish informs me, that those which feed on the wood of the oak are paler in colour than those which feed on the willow.

Genus 333. ZEUZERA. *Latr., Leach.* Bombyx. *Hübner.* Hepialus. *Schrank.* Phalæna (Noctua). *Linné.* Cossus. *Fabr.*
Antennæ setaceous, of the males pectinated at their base; of the females entirely simple, with the exception of their base, which is tomentose.
Sp. 1. *Zeu. Æsculi* (wood leopard-moth).
Inhabits Europe. In England it is rather rare; but may be found against trees in St. James's Park in July, if industriously sought after.

Stirps 2.—*Wings* broad and spreading: *larva* more or less hairy, its hinder legs formed for walking: *pupa* with its segments simple.

Genus 334. SATURNIA. *Schrank, Leach.* Phalæna (Attacus). *Linné.* Bombyx. *Fabr., Hübner, Latr.*
Wings horizontal: *antennæ* subcylindric: of the male doubly pectinated: *hinder wings* simple.
Sp. 1. *Sat. Pavonia minor* (emperor moth).

Stirps 3.—*Wings* deflexed: *larvæ* more or less hairy, its hinder legs formed for walking: *pupa* with its segments simple.

"* *Antennæ in both sexes pectinated.*"

Genus 335. LIPARIS. *Och., Germ., Leach's MSS.* Hypogymna. *Hüb.*
Palpi porrected, hairy, composed of two joints, the last of which is incrassated at its extremity: *tongue* obsolete: *antennæ* setaceous.
Sp. 1. *Lip. Monacha* (black arches). Sp. 2. *Lip. dispar* (gipsy moth).

Genus 336. LARIA. *Schrank, Leach, Germar.* Orgya. *Och.*, Dasychira. *Hübner.*
Palpi very hairy, three-jointed: last joint minute linear and almost naked: *tongue* obsolete: *antennæ* filiform.

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Sp. 1. *Lar. pudibunda* (pale tussock). Sp. 2. *Lar. fascelina* (dark tussock).

Genus 337. GASTROPACHA. *Och., Germ., Leach's MSS.*

Palpi porrected, three-jointed, hairy, subcylindric, with obtuse points: *tongue* obsolete: *antennæ* filiform.

Sp. 1. *Gas. quercifolia* (lappet moth).

"** *Antennæ of the male alone pectinated.*"

Genus 338. ODENESIS. *Germar, Leach's MSS.*

Palpi porrect, hairy and three-jointed, dilated in the middle, attenuated and reversed at their extremities: *tongue* very short: *antennæ* filiform.

Sp. 1. *Od. potatoria.* (*Pl.* 12. *fig.* 3.)

Genus 339. LASIOCAMPA. *Schrank, Leach, Germar.*

Palpi compressed, porrected, very hairy, two-jointed; the second joint elongate obtuse: *tongue* obsolete: *antennæ* filiform.

Sp. 1. *Las. Quercus* (egger moth). Sp. 2. *Las. trifolia*, &c.

Genus 340. ERIOGASTER. *Germar, Leach's MSS.*

Palpi very short and very hairy, subglobose: *tongue* obsolete: *antennæ* filiform.

Sp. 1. *Eri. lanestris.* Sp. 2 *Eri. Populi.*

Genus 341. ENDROMIS. *Och., Germ., Leach's MSS.* DIMORPHA. *Hüb.*

Palpi compressed, recurved, very hairy; second joint obtuse: *tongue* very obsolete: *antennæ* filiform.

Sp. 1. *End. versicolor* (Kentish glory).

OBS.—Bombyx rubra, &c. forms the Genus PENTHROPHERA. *Germ.*

Genus 342. STAUROPUS. *Germ., Leach's MSS.* HARPYIA. *Och.*

Palpi reflexed, compressed, hairy and biarticulated; last joint minute: *tongue* obsolete: *antennæ* filiform (of the male naked at their extremities).

Sp. 1. *Stau. Fagi* (lobster moth).

Genus 343. NOTODONTA. *Och., Germar, Leach's MSS.* PTILODONTIS. *Hüb.*

Palpi short, very hairy, two-jointed; first joint very short, second compressed and truncate: *tongue* short: *antennæ* filiform.

Sp. 1. *Not. Tritopus.* Sp. 2. *Ziczac.* Sp. 3. *Dromedarius.* Sp. 4. *Trepida.*

Genus 344. PYGÆRA. *Och., Germar, Leach's MSS.* MELALOPHA. *Hüb.*

Palpi very hairy, two-jointed; first joint incurved, second reversed obtuse: *tongue* abbreviated, but spiral: *antennæ* setaceous.

Sp. 1. *Pyg. Bucephala* (buff-tip).

OBS.—Bombyx curtula, 2. reclusa, form the genus CLOSTERA *of Hoffmansegg.*

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STIRPS 4. *Wings* deflexed: *larva* with its hinder legs converted into a furcate tail.

Genus 345. CERURA. *Schrank, Leach, Germar.* ANDRIA. *Hübner.*
Palpi cylindrical, hairy obtuse, with their joints confluent: *tongue* spiral but abbreviated: *antennæ* filiform pectinated.
Sp. 1. *Cer. Vinulia* (puss moth). Sp. 2. *Cer. Furcula* (kitten moth).

The caterpillar of both the above feeds on leaves: the first may frequently be found in August and September on willows and poplars; the latter species is not common in Britain.

Fam. VI. ARCTIADÆ. *Leach.*

NOCTUO-BOMBYCITES. *Latr.*

Palpi two; *antennæ* pectinated or ciliated: *tongue* visible, but often short and somewhat membranaceous: *wings* trigonate, deflexed, undivided: *caterpillar* with sixteen feet.

Genus 346. ARCTIA. *Schrank, Latreille, Leach.* BOMBYX. *Fabr.*
Palpi with long scales: *antennæ* of the males (at least) with a double series of pectinations: *tongue* often short, composed of two separate filaments.

** Antennæ ciliated.*

Sp. 1. *Arc. villica* (cream spot tyger). Sp. 2. *Arc. Caja* (tyger moth). Sp. 3. *Arc. Plantaginis* (wood tyger). Sp. 4. *Arc. russula* (clouded buff). Sp. 5. *Arc. mendica* (muslin). Sp. 6. *Arc. Menthrastri* (ermine). Sp. 7. *Arc. papyritia* (water ermine). Sp. 8. *Arc. lubricipeda* (buff ermine).

*** Antennæ pectinated.*

Sp. 1. *Arc. Salicis* (satin moth). Sp. 2. *Arc. chrysorrhœa* (yellow-tail). Sp. 3. *Arc. phœorrhœa* (brown-tail moth).

Genus 347. CALLIMORPHA. *Latr., Leach.* BOMBYX. *Fabr.* LITHOSIA. *Fabr.*
Palpi with short not porrect scales: *antennæ* simple or slightly ciliated: *tongue* long, the two filaments conjoined.
Sp. 1. *Cal. Dominula* (scarlet tyger moth).

OBS.—Bombyx; 2. *Rosea* (red arches). 3. *Jacobeæ* (cinnabar); are referable to this genus.

Fam. VII. TINEIDÆ. *Leach.*

TINEITES. *Latreille.*

Antennæ setaceous, simple: *tongue* distinct: *palpi* two, cylindric: *wings* long, oblong, somewhat elliptic, incumbent or convolute: inferior ones much folded, all undivided.

STIRPS 1.—*Antennæ* distant from each other: *eyes* separate, divided by a frontlet: *tongue* elongate: *palpi* not longer than the head.

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Genus 348. LITHOSIA. *Fabr., Latr., Leach.*

Wings horizontal: *palpi* shorter than the head, last joint cylindric, distinctly shorter than the second: *back* much flattened: *antennæ* simple or but slightly ciliated.

Sp. 1. *Lit. quadra* (four-spotted footman). Sp. 2. *Lit. complana*, &c.

Genus 349. YPONOMEUTA. *Latr., Leach.* TINEA. *Fabr., Hübner, Haworth.*

Wings rolled or convoluted: *palpi* as long as the head; the third joint obconic, as long or longer than the one before it: *antennæ* simple.

Sp. 1. *Ypo. Evonymella.*

STIRPS 2.—*Antennæ* separate: *eyes* separate: *tongue* elongate: *palpi* much longer than the head, over which they are recurved.

Genus 350. ÆCOPHORA. *Latr.* NEMAPOGON. *Schrank, Leach.* PHALÆNA (Tinea). *Linné.* TINEA. *Fabr.* ALUCITA. *Oliv.*

Wings broadly fringed, lying on the back: *palpi* twice as long or more than the body; the second joint longer than the head, the last joint almost naked, recurved beyond the head.

OBS.—To this genus TINEA 1. *Linneella.* 2. *Flavella.* 3. *Roesella*, and their congeners belong.

STIRPS 3.—*Tongue* not distinct, very short: *front* very hairy: *palpi* longer than the head, the second joint hairy.

Genus 351. EUPLOCAMUS. *Latr., Leach.* TINEA. *Fabr.* PYRALIS. *Hübner.*

Palpi two; the second joint with numerous elongate scales, the third joint naked and ascending: *antennæ* much pectinated.

Sp. 1. *Eup. Guttella.* Fabr.

Genus 352. PHYSIS. *Fabr., Hübner, Leach.* PHALÆNA (Tinea). *Linné.*

Palpi four, distinct; upper ones small, inflexed: *antennæ* simple, or slightly ciliated.

Sp. 1. *Phy. Pelionella* (clothes moth).

Inhabits houses.

OBS.—All the cloth moths, of which there are several species, belong to this genus.

STIRPS 4.—*Antennæ* very long, contiguous: *eyes* subcontiguous: *tongue* elongate: *palpi* very hairy, ascending not longer than the head.

Genus 353. ADELA. *Latr., Leach.* NEMOPHORA. *Hoffmanscgg.* NEMAPOGON. *Schrank.* ALUCITA. *Fabr.* TINEA. *Hübner.* PHALÆNA (Tinea). *Linné.*

Sp. 1. *Ad. Degeerella* (Japan-moth).

Inhabits the borders of woods.

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Obs.—All the long-horned Japan moths, as they are called by English collectors, belong to this genus.

Fam. VIII. Noctuadæ. *Leach.*

Noctuælites. *Latreille.*

Antennæ setaceous in the males, sometimes pectinated or ciliated: *tongue* distinct: *palpi* much compressed: *wings* horizontal or incumbent, not divided: *thorax* thick, often crested: *palpi* with the last joint much shorter than the preceding, squamose.

Genus 354. NOCTUA. *Fabr., Latr., Hübner, Leach.* Bombyx. *Fabr., Hüb.* Phalæna (Bombyx). *Linné.* Phalæna (Noctua). *Linné.* Pæcilia. *Schrank.* Cucullia. *Schrank.*

The genus *Noctua* requires a minute investigation. It contains several natural genera, as exhibited in the following divisions.

A. Caterpillars with sixteen feet.

* *Caterpillars half loopers, their anterior feet membranaceous, evidently shorter than the others. Wings horizontal.*

Sp. 1. *Noc. sponsa* (crimson underwing). Sp. 2. *Noc. nupta, &c.*

** *Caterpillars with membranaceous feet of conformable size.*

1. Wings horizontal.

Sp. 1. *Noc. fimbria* (broad-bordered yellow underwing). Sp. 2. *Noc. pronuba.* 3. *Noc. Orbona.* 4. *Noc. janthia, &c.*

2. Wings deflexed.

a. Sp. 1. *Noc. Rumicis* (common knot grass). 2. *Noc. Psi, &c.*
b. Sp. 1. *Noc. Ligustri* (coronet). 2. *Noc. Pisi* (broom moth), &c.
c. Sp. 1. *Noc. Verbasci.* 2. *Noc. Tanaceti* (shark moths), &c.
d. Sp. 1. *Noc. Batis* (peach blossom moth).
e. Sp. 1. *Noc. meticulosa* (angle shades).
f. Sp. 1. *Noc. palpina* (pale prominent moth).
g. Sp. 1. *Noc. camelina.*

B. Caterpillar with fourteen feet.

Sp. 1. *Noc. chrysites* (burnished brass). *Noc. festucæ* (gold spot), &c.

Notice of the following genera has lately reached this country from the Continent: the undermentioned indigenous species, which may be considered as types, are selected from the MSS. of Dr. Leach: I have added the English names, as it may enable those who have small collections of *Lepidoptera* to proceed in the natural arrangement.

Genus Colocasia. *Och.* Jaspidia. *Hüb.*

Sp. 1. *Noc. bombyx coryli* (nut-tree tussock).

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Genus Poecilia. *Schrank, Och.* Jaspidia. *Hüb.*
Sp. 1. *Noc. lichensis* (marbled green). 2. *Noc. perla* (marbled beauty).

Genus Tethea. *Och.*
Sp. 1. *Noc. retusa* (double kidney). 2. *Noc. subtusa* (olive). 3. *Noc. ridens* (the frosted green).

Genus Agrotis. *Hüb., Och.*
Sp. 1. *Noc. Ruris* (rufous dart). 2. *Noc. Segetum* (brown heart and club).

Genus Graphiphora. *Hüb., Och.*
Sp. 1. *Noc. Augur* (double dart). *Fabr.*

Genus Amphipyra. *Och.* Pyrophila. *Hüb.*
Sp. 1. *Noc. Tragopogonus* (the mouse). 2. *Noc. tetra* (the mahogany).

Genus Mormo. *Ochen.* Lemur. *Hüb.*
Sp. 1. *Noc. maura* (great brown bar). *Fabr.*

Genus Hadena. *Schrank, Och.*
Sp. 1. *Noc. Cucubali* (campion). 2. *Noc. Pteridis.* Fabr.

Genus Miselia. *Hüb., Sch.*
Sp. 1. *Noc. compta* (marbled coronet).

Genus Polia. *Hüb., Och.*
Sp. 1. *Noc. Chi* (Chi moth). 2. *Noc. flavocincta* (large ranunculus).

Genus Trachea. *Och.* Achatia. *Hübn.*
Sp. 1. *Noc. atriplicis* (arrach moth). 2. *Noc. præcox* (Portland moth)

Genus Apamea. *Och.*
Sp. 1. *Noc. basilinea* (rustic shoulder knot). *Fabr.*

Genus Mamestria. *Och.*
Sp. 1. *Noc. Pisi* (broom). 2. *Noc. Chenopodii* (nutmeg).

Genus Thyatira. *Och.*
Sp. 1. *Noc. Batis* (peach blossom). 2. *Noc. derasa* (buff arches).

Genus Mythimna. *Och.*
Sp. 1. *Noc. turca* (double line).

Genus Caradrina. *Och.*
Sp. 1. *Noc. Morpheus.*

Genus Leucania. *Och.* Heliophila. *Hüb.*
Sp. 1. *Pha. comma* (shoulder stripe wainscot).

Genus Nonagria. *Och.*
Sp. 1. *Noc. Typhæ* (bull-rush). 2. *Noc. Arundinis.*

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Genus Gortyna. *Och.*
Sp. 1. *Noc. flavago.* Hüb. *Rutilago* (frosted orange). *Fabr.*

Genus Xanthia. *Hüb., Och.*
Sp. 1. *Noc. Luteago.* 2. *Noc. Croceago* (orange upper wing).

Genus Cosmia. *Hüb., Och.*
Sp. 1. *Noc. affinis* (lesser spotted pinion). 2. *Noc. diffinis* (white spotted pinion). *Fabr.*

Genus Cerastis. *Och.* Glæa. *Hüb.*
Sp. 1. *Noc. Vaccinii* (chesnut). 2. *Satellitia* (satellite.)

Genus Xylena. *Hüb., Och.*
Sp. 1. *Noc. exoleta* (large second grass). 2. *Noc. putris* (flame). 3. *Noc. hepatica* (clouded bordered brindle). 4. *Noc. Pinastri* (bird's wing).

Genus Cucullia. *Schrank, Och.* Tribonophora. *Hüb.*
Sp. 1. *Noc. Artemisiæ.* 2. *Noc. Absinthii* (wormwood). 3. *Noc. Umbraticæ* (large pale shark). 4. *Noc. Scrophularia* (water betony).

Genus Abrostola. *Och.*
Sp. 1. *Noc. triplacea.* 2. *Noc. Asclepiades.*

Genus Anarta. *Och.*
Sp. 1. *Noc. Myrtilli* (beautiful yellow underwing).

Genus Heliothis. *Och.* Heliocentis. *Hüb.*
Sp. 1. *Noc. dipsacea* (marbled clover).

Genus Erastria. *Och.* Erotyla. *Hüb.*
Sp. 1. *Unca. Pyralis unca* (silver hook),

Genus Brepha. *Hüb.* Brephos. *Och.*
Sp. 1. *Noc. Parthenias* (orange underwing). 2. *Noc. notha* (light orange underwing).

Genus Euclidia. *Hüb., Och.*
Sp. 1. *Noc. Mi* (Shipton). 2. *Noc. triquetra.*

Fam. IX. Phalænidæ. *Leach.*

Phalænites. *Latreille.*

Antennæ approximating at their base; those of the male often pectinated or ciliated: *clypeus* scarcely prominent: *feet* slender, rarely hairy: *palpi* two: *wings* undivided.

Stirps 1.—*Larva* with twelve feet.

Genus 355. PHALÆNA. *Linné, Fabr., Latr., Leach.* Geometra. *Haworth, Hübner.*

Antennæ setaceous of the male pectinated.

Sp. 1. *Pha. margaritaria* (large emerald moth), &c.

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STIRPS 2.—*Larva* with ten feet.

Genus 356. HIPPARCHUS. *Leach.* PHALÆNA. *Fabr., Latr., Linn.* GEOMETRA. *Hübner, Haworth.*

Wings extended obliquely, the upper wing covering the lower ones: *body* slender: *palpi* slightly hirsute: *antennæ* of the male pectinated.

Sp. 1. *Hip. papilionarius* (large emerald). 2. *Hip. prunata, &c.*

Genus 357. BUPALUS. *Leach.* PHALÆNA. *Linné, Fabr., Latr.* GEOMETRA. *Hübner, Haworth.*

Antennæ pectinated in the male: *body* slender: *palpi* slightly hirsute: *wings* horizontally extended, not angulated or indented.

Sp. 1. *Bup. pinarius* (the bordered white).

Inhabits pine forests.

Genus 358. GEOMETRA. *Hübner, Haworth, Leach.* PHALÆNA. *Fabr., Latr., Linné.*

Antennæ of the male pectinated: *body* slender: *palpi* but little or not at all hairy: *wings* horizontally extended; hinder margin very angular.

Sp. 1. *Geo. lunaria* (the lunar thorn). Sp. 2. *Geo. dolabraria* (scorched wing), &c.

Genus 359. OURAPTERYX. *Leach.* PHALÆNA. *Latr., Linné, Fabr.*

Antennæ somewhat ciliated: *body* slender: *palpi* but little hairy. *wings* horizontally extended; inferior ones prolonged, truncate, and terminated by a tail.

Sp. 1. *Our. sambucaria* (swallow-tail moth).

Genus 360. BISTON. *Leach.* PHALÆNA. *Linné, Fabr., Latr.* GEOMETRA. *Hübner, Haworth.*

Antennæ of the male much pectinated: *body* thick: *palpi* very hairy.

Sp. 1. *Bis. prodromaria* (oak beauty). 2. *Bis. betularia* (the peppered). 3. *Bis. hirtaria* (the brindled beauty), &c.

Genus 361. ABRAXAS. *Leach.* PHALÆNA. *Linné, Fabr., Latr., Hüb., Haworth.*

Antennæ simple, not ciliated: *body* slender: *palpi* scarcely hirsute: *wings* extended horizontally, not angulated or indented.

Sp. 1. *Abr. grossulariata* (common magpie moth). 2. *Abr. ulmaria* (scarce magpie moth), &c.

STIRPS 3.—*Caterpillars* with fourteen feet; the anal ones distinct; the first pair of membranaceous ones wanting.

Genus 362. HERMINIA. *Latr., Leach.* PHALÆNA (Pyralis). *Linné.* CRAMBUS. *Fabr., Bosc.* PYRALIS. *Hub.*

Wings triangulate, nearly horizontal: anterior margin of the upper wings straight: *palpi* two, recurved, compressed, often very large: *antennæ* ciliated.

Sp. 1. *Her. proboscidalis* (the snout), &c.

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Stirps 4.—*Caterpillars* with fourteen feet, anal ones wanting; the first pair of membranaceous ones distinct.

Genus 363. PLATYPTERYX. *Laspeyeres, Latr., Leach.* Phalæna. *Fabr.*

Anterior wings falcate: *antennæ* of the male pectinate: *palpi* very short, somewhat conic: *tongue* short.

Sp. 1. *Pla. falcataria* (pebble hooktip). 2. *Pla. lacertanaria* (the scolloped hooktip), &c.

Obs.—The last species has the anterior wings dentate.

Genus 364. CILIX. *Leach.* Bombyx. *Fabr.* Platypteryx. *Latr.*

Anterior wings rounded: *antennæ* of the male pectinated: *palpi* very short, somewhat conic: *tongue* none.

Sp. 1. *Cil. compressa* (goose-egg moth).

Bombyx compressus. *Fabr.*

Stirps 5.—*Caterpillars* with sixteen feet: *wings* with the body forming a broad short triangle, dilated on each side anteriorly.

Genus 365. TORTRIX. *Hübner, Leach.* Phalæna (Tortrix). *Linné.* Pyralis. *Latr., Fabr.*

Palpi with the second joint distinctly longer than the third, and more squamous; third joint short, truncate or obtuse, not recurved over the head.

Sp. 1. *Tor. Fagana.*

Genus 366. SIMAËTHIS. *Leach.* Tortrix. *Hübner.* Pyralis. *Latr.*

Palpi short, rising; the last joint not recurved over the head; with the second and third joints nearly equally long and equally squamose: *inferior wings* not completely covered by the upper ones.

Sp. 1. *Sim. dentana.*

Tortrix dentana. *Hübner.*

Genus 367. NOLA. *Leach.* Pyralis. *Hüb., Latr.*

Palpi short, porrect, last joint not recurved over the head; the second and third joints nearly equally long and equally squamose: *under wings* completely covered by the upper ones.

Sp. 1. *Nola palliolatis.*

Pyralis palliolatis. *Hübner, Latr.*

Fam. X. Pyralidæ. *Leach.*

Crambites. *Latreille.*

Palpi four: *larva* (as far as has been ascertained) with sixteen feet.

Stirps 1.—*Superior wings* forming with the body a nearly horizontal depressed triangle.

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Genus 368. BOTYS. *Latr., Leach.* PHALÆNA (Pyralis). *Linné.* PYRALIS. *Hübner, Schrank, Scopoli, Haworth.* NYMPHALA. *Schrank.* SCOPULA. *Schrank.* PYRAUSTA. *Schrank.* CRAMBUS. *Fabr.*

Tongue distinct, conspicuous: *palpi* exserted.

Sp. 1. *Bot. purpuraria.*

Genus 369. PYRALIS. *Hübner, Schrank, Schiffermuller, Leach.* PHALÆNA (Pyralis). *Linné.* CRAMBUS. *Fabr.* AGLOSSA. *Latr.*

Tongue none: *inferior palpi* largest, the second joint very squamous, the squamæ porrected in bundles.

Sp. 1. *Pyr. pinguinalis* (the large tabby).

Crambus pinguinalis. *Fabr.*

STIRPS 2.—*Superior wings* very long, enveloping the sides of the body.

Genus 370. GALLERIA. *Fabr., Latr., Leach.* PHALÆNA (Tinea). *Linné.* TINEA. *Geoffroy.*

Tongue very short: *palpi* short: *inferior palpi* largest, with close scales; upper ones concealed by the scales of the clypeus: *wings* narrow, covering and pressing against the sides of the body.

Sp. 1. *Gal. alvearia.*

Genus 371. CRAMBUS. *Fabr., Latr., Leach.* PHALÆNA (Tinea). *Linné.* TINEA. *Geoffroy.*

Wings narrow, convoluted round the body: *palpi* exserted, inferior ones largest: *head* with short close-applied scales: *tongue* distinct.

Sp. 1. *Cram. Pineti.*

Genus 372. TINEA. *Hübner, Geoff., Scop., Leach.* ALUCITA. *Latr.* PHALÆNA (Tinea). *Linné.* YPSOLOPHUS. *Fabr.*

Wings narrow, abruptly deflexed, behind and above ascending: *inferior palpi* with the second joint covered with numerous fasciculi of scales; the last erect, conic, naked: *head* with a bifid crest in front.

Sp. 1. *Tin. Nemorum.*

Fam. XI. ALUCITADÆ. *Leach.*

PTEROPHORITES. *Latreille.*

Wings divided, or formed of feathers united at their base.

Genus 373. PTEROPHORUS. *Geoff., Latr., Fabr., Leach.* ALUCITA. *Hübner, Schrank, Scopoli.* PHALÆNA (Alucita). *Linné.*

Palpi small, from their base ascending, not longer than the head, shortly and nearly equally squamose: *anterior wings* composed of two, *posterior* of three feathers: *pupa* naked, suspended by a hair.

Pter. pentadactylus.

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Genus 374. ALUCITA. *Hübner, Scopoli, Leach.* Pterophorus. *Geoff., Fabr.* Phalæna (Alucita). *Linn., Villers.* Orneodes. *Latr.*

Palpi produced much longer than the head; the second joint very squamous; the last joint naked, erect: *pupa* folliculate.

Sp. 1. *Alu. hexadactyla.*

Order XI. TRICHOPTERA.

Order Trichoptera. *Kirby, Leach.*

Order Neuroptera. *Linn., Cuv., Latr., Lam., &c.*

Characters of the Order.

"*Wings* much deflexed, with strong nervures, hispid or hairy, the lower wings plicate: *antennæ* inserted between the eyes, often very long, composed of an infinity of joints: *feet* elongate, spinulose: *tarsi* elongate, five-jointed; the last joint with two small nails: *larva* elongate, agile, somewhat cylindric, composed of twelve joints, the three first harder than the rest, and each bearing a pair of feet; the last segment with two hooked processes. It inhabits tubes constructed of sand, bits of wood, stones, or grass, glued together by a cement impenetrable to water: *pupa* somewhat resembling the perfect insect, shut up in the tube it inhabited whilst a larva, but having the power of motion prior to its emerging from the water (in which it resides), for the purpose of changing into the fly-state."

Genus 375. PHRYGANEA. *Linné, Fabr., Geoff., Latr., Leach.*

Dr. Leach has paid the greatest attention to the insects of this Order, having collected them with unexampled assiduity in various parts of England, Ireland, Scotland, and Wales. The Doctor will probably publish a work on this Order. When published, I must refer the student to it for a further account of the genera.

Fam. I. Leptoceridæ. *Leach.*

Antennæ much longer than the whole body.

Genus 376. LEPTOCERUS. *Leach.*

Antennæ simple, not denticulated.

Sp. 1. *Lept. interruptus.*

Phryganea interrupta. *Fabr.*

Inhabits Great Britain. It is found in great plenty near Luss, on the banks of Loch Lomond, on the margins of rivulets at Dreghorn near Edinburgh, and near Carlisle in northern England. It occurs during the day-time on the smaller branches of trees, and in the afternoon flies about in great abundance, in flocks.

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Genus 377. ODONTOCERUS. *Leach.*

Antennæ with the inner edge denticulated.

Sp. 1. *Odon. griseus.* Leach.

Inhabits Ireland and England.

Fam. II. PHRYGANIDÆ. *Leach.*

Antennæ as long as the body.

Genus 378. PHRYGANEA. *Leach.*

Anterior wings soft, villose.

Sp. 1. *Phr. grandis.*

Inhabits woods.

Genus 379. LIMNEPHILUS. *Leach.*

Anterior wings slightly coriaceous, nervures hispid or hairy.

Sp. 1. *Lim. rhombicus.* Leach.

Phryganea rhombica. *Linn.*

Inhabits trees in woods and marshes.

Order XII. NEUROPTERA. *Leach, Linn., Latr., Cuv.*

Class ODONATA. *Fabr.*

Class SYNISTATA. *Fabr.*

Wings four, naked, reticulated, and divided into a vast number of areolæ.

Section I. *SUBULICORNES.*

Antennæ subulate, very short, the last joint setiform: *maxillary palpi* very short: *wings* extended horizontally or erect, very much reticulated: *metamorphosis* semicomplete: *larva and pupa* aquatic, somewhat resembling the perfect insect.

Fam. I. LIBELLULIDÆ. *Leach.*

LIBELLULINÆ. *Latreille.*

Tarsi three-jointed: *mandibles* strong, corneous: *maxillæ* corneous, strong: *wings* equal, or the hinder ones a little larger at their base: *abdomen* not terminated with setæ or filaments: *eyes* very large.

STIRPS 1.—*Wings* horizontal: *head* hemispheric, with a distinct vesicle on which the little eyes are placed in a triangle: *abdomen* more or less depressed: *lip* with the middle lamella smallest.

Genus 380. LIBELLULA. *Linn., Fabr., Latr., Leach.*

Posterior wings alike in both sexes.

Sp. 1. *Lib. depressa.* All the wings blackish at the base; the abdomen depressed; of the male blueish, the female yellowish.

Libellula depressa. *Linn., Fabr., Latr., Leach.*

Inhabits gardens and woods, flying over them in pursuit of insects.

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Genus 381. CORDULIA. *Leach.* LIBELLULA. *Linn., Don., Panz., Latr.*

Posterior wings of the male produced into an angle at the anal edge.

Sp. 1. *Cor. ænea.* Wings pellucid: thorax and abdomen of a brassy green.

Inhabits marshy places on Epping Forest and the New Forest of Hampshire in June and July.

STIRPS 2.—*Wings* horizontal: *head* hemispheric, without a distinct vesicle for the little eyes, which are arranged in a straight line: *abdomen* cylindric, sometimes clavate: *lip* with the middle lamella not much smaller than the others.

Genus 382. CORDULEGASTER. *Leach.* LIBELLULA. *Linn., Don.* ÆSHNA. *Latr.*

Hinder wings of the male angulated at their anal edge: *abdomen* of the male clavate, of the female with an acuminated process.

Sp. 1. *Cor. annulatus.* Leach.

Libellula forcipata. *Harris.* Æshna annulata. *Latr.* Libellula Boltonii. *Don.*

Inhabits Yorkshire, Devonshire, Dorsetshire, Somersetshire, Hampshire, and Cornwall. It likewise occurs amongst the Lakes, in the North of England; amongst the Pentland Hills, near Edinburgh; and on Loch Lomond and Lock Katrine.

Genus 383. GOMPHUS. *Leach.* LIBELLULA. *Linn., Don.*

Hinder wings of the male angulated at their anal edge: *abdomen* clavate in both sexes.

Sp. 1. *Gom. vulgatissimus.* Leach.

Libellula vulgatissima. *Linn.* Libellula forcipata. *Don.*

Inhabits Europe. It occasionally occurs on Epping Forest, and at Coombe Wood in Surry.

Genus 384. ÆSHNA. *Leach, Fabr.* LIBELLULA. *Linn., Don.*

Hinder wings of the male angulated at their anal edge: *abdomen* cylindric in both sexes, not clavate.

Sp. 1. *Æsh. grandis.* Fabr., Leach.

Libellula grandis. *Linn., Don.*

Inhabits the fields near London; Hackney and Plaistow Marshes; but is difficult to catch unless in windy weather, when it may be found on the water plants growing in ditches. It may also be taken at the dusk of fine evenings in the months of June and July, flying in pursuit of various insects which appear only at these times.

Genus 385. ANAX. *Leach.*

Hinder wings of the male not angulated at their anal edge, but resembling those of the female: *abdomen* cylindric in both sexes; not clavate.

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Sp. 1. *Anax Imperator.*

Inhabits England in the New Forest of Hampshire. It is necessary to inform the young entomologist, that the insects of the first and second stirpes of this family require, whilst in a recent state, that the contents of the abdomen should be extracted, and filled with either a piece of paper or cotton, rolled up as near as possible to the natural size of the body, as without this precaution the insects will lose their colour and turn entirely black. For further directions see Instructions for Killing and Preserving.

STIRPS 3.—*Wings* erect: *head* transverse: *abdomen* cylindric, linear: *ocelli* or little eyes placed in a triangle.

Genus 386. AGRION. *Fabr., Latr., Leach.* LIBELLULA. *Linn.*

Wings membranaceous, with a rhomboidal stigma: *abdomen* of the male not armed with a forceps-like appendage.

Sp. 1. *Agrion sanguineus.*

Inhabits marshes.

Genus 387. LESTES. *Leach.*

Wings membranaceous with an oblong-quadrate parallelopiped stigma: *abdomen* of the male armed with a forceps-like appendage.

Sp. 1. *Lestes autumnalis.*

Inhabits marshy places.

Genus 388. CALEPTERYX. *Leach.* AGRION. *Fabr., Latr.*

Wings coriaceo-membranaceous, without a real stigma, in place of which is sometimes an irregular transparent spot: *abdomen* of the male furnished with a forceps-like appendage.

Sp. 1. *Cal. Virgo.*

Inhabits the banks of rivers.

Fam. II. EPHEMERIDÆ. *Leach.*

EPHEMERINÆ. *Latreille.*

Tarsi four-jointed: *mouth* not distinct: *inferior wings* much smaller than the others, sometimes wanting: *abdomen* with the extremity furnished with filaments. *Metamorphosis* quadruple.

STIRPS 1.—*Tail* with two filaments.

Genus 389. BAËTIS. *Leach.* EPHEMERA. *Linn., Fabr., Latr.*

Wings four.

Sp. 1. *Baëtis bioculata.*

Inhabits near water.

Genus 390. CLOEON. *Leach.*

Wings two.

Sp. 1. *Clo. pallida.*

Ephemera diptera. *Linn., Fabr.*

Inhabits Norfolk and Cumberland, near large pieces of water.

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Stirps 2.—*Tail* with three filaments.

Genus 391. EPHEMERA *of authors.*

Sp. 1. *Eph. vulgata.* (*Pl. 7. fig. 2.*)

Inhabits marshes, and the banks of rivers.

Section II. *FILICORNES.*

Antennæ longer than the head, not subulate: *wings* generally deflexed or incumbent.

Fam. III. Panorpidæ. *Leach.*

Panorpatæ. *Latreille.*

Head anteriorly produced into a rostrum: *wings* equal, ovate-elliptic, lying one over the other: *ocelli* three, approximate, arranged in a triangle.

Genus 392. PANORPA. *Linn., Fabr., Lam., Latr., Leach.*

Tarsi with two bent claws, denticulated beneath, having a spongy pulvillus between them: *palpi* nearly equal, filiform; the last joint cylindric-ovate: *mandibles* with their points distinctly bidentate: *abdomen* of the male with the three last joints forming a tail armed with a forceps.

Sp. 1. *Pan. communis.* (*Pl. 7. fig. 5. a. chela magnified.*)

Inhabits hedges, and is very abundant in this country.

Fam. IV. Hemerobiadæ. *Leach.*

Hemerobini. *Latreille.*

Antennæ filiform or setaceous: *palpi* four: *wings* equal: *tarsi* five-jointed.

Stirps 1.—*Ocelli* or little eyes not distinct.

Genus 393. CHRYSOPA. *Leach.* Hemerobius *of authors.*

Antennæ (at least as long as the body) with cylindric joints longer than broad.

Sp. 1. *Chrys. Perla.*

Hemerobius Perla. *Linné, Fabr., Latr.* Chrysopa Perla. *Leach.*

Inhabits woods, and is a common species.

Genus 394. HEMEROBIUS. *Leach, &c.*

Antennæ as long or shorter than the body, with moniliform joints.

Sp. 1. *Hem. variegatus.*

Inhabits ——: is rare near London.

Stirps 2.—*Ocelli* three, distinct.

Genus 395. OSMYLUS. *Latr., Leach.* Hemerobius. *Fabr. Villers, Roemer, Don.*

Antennæ moniliform.

Sp. 1. *Osm. maculatus.* Fuscous; head and feet testaceous: wings hairy, the upper ones and the costal margin of the inferior ones spotted with black. (*Pl. 7. fig. 4.*)

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Inhabits France, Germany, and England, in trees and hedges by the sides of running brooks.

Fam. V. Sialidæ. *Leach.*

Megaloptera. *Latreille.*

Thorax with the first segment large, not much longer than broad: *tarsi* five-jointed: *wings* of equal size: *feet* resembling each other.

Genus 396. SIALIS. *Latr., Leach.* Hemerobius. *Geoff., De Geer, Oliv.* Semblis. *Fabr.*

Wings deflexed: *tarsi* with the last joint but one bifid: *ocelli* none.

Sp. 1. *Si. niger.*

Inhabits trees; the larva in water.

Fam. VI. Raphidiadæ. *Leach.*

Rhaphidinæ. *Latreille.*

Wings of equal size: *thorax* with the first segment large: *tarsi* with four distinct joints, the last but one bilobate: *antennæ* nearly setaceous: *ocelli* three, arranged in a triangle.

Genus 397. RAPHIDIA. *Linn., Geoff., De Geer, Fabr., Oliv., Lam., Latr., Leach.*

Head oval, narrowed behind, inflexed: *thorax* with the first segment very long, narrow, and somewhat cylindric: *anus* of the female with two united setæ.

Sp. 1. *Raph. ophiopsis.* (*Pl. 7. fig. 6.*)

Inhabits trees and bushes near rivulets.

Fam. VII. Psocidæ. *Leach.*

Psoquillæ. *Latreille.*

Inferior wings smaller than the superior ones: some are apterous: *palpi* two, composed of four joints.

Stirps 1.—*Tarsi* two-jointed.

Genus 398. PSOCUS. *Latr., Leach.*

Wings four.

Sp. 1. *Pso. bipunctatus.* Latr.

Inhabits woods.

Stirps 2.—*Tarsi* three-jointed.

Genus 399. ATROPOS. *Leach.* Termes. *Linn., De Geer.* Psocus. *Fabr., Latr.* Pediculus. *Geoff.*

Wings none.

Sp. 1. *Atr. lignaria.*

Termes pulsatorium. *Linn.* Atropos lignaria. *Leach.*

Inhabits old books, and the paper on walls, often beating like a watch.

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Order XIII. HYMENOPTERA.

Order Hymenoptera. *Linn., Latr., Lam., Cuv., Leach.*

Class Piezata. *Fabricius.*

Characters of the Order.

Wings nervured (the areolæ large and unequal in size), the inferior ones smaller than the upper: *anus* of the female with an oviduct.

Section I. *TEREBRANTIA.*

Oviduct lamelliform or filiform; in a few resembling a sting and valved; the vagina bivalve, received in a canal beneath, before the anus: the valves compressed, in some compressed-lamelliform, in others elongate-cylindric, setaceous.

Division I.—*Abdomen united to the thorax along its whole breadth, without any distinct peduncle.*

Fam. I. Tenthredinidæ. *Leach.*

Tenthredinetæ. *Latreille.*

Abdomen sessile: *oviduct* composed of two lamellæ which are serrated: *mandibles* more or less long, terminated by two strong teeth: *wings* with the marginal cells complete: *labrum* distinct.

Larvæ with membranaceous feet.

In the third volume of the *Zoological Miscellany* Dr. Leach has given an excellent essay on this very interesting family of insects. "The object of which is to give the external character of the genera of this family, to enable the student to distinguish them without examining the parts of the mouth."

Stirps 1.—*Antennæ* short and clavated; with the third joint very long: *superior wings* with two marginal and three submarginal cells.

Genus 400. CIMBEX *Oliv., Fabr., Spinoli, Latr., Leach.* Tenthredo. *Linné, Jurine, Panz., De Geer.* Crabro. *Geoffroy.* Clavellaria. *Lamarck.*

Body slightly hairy: *abdomen* with the first articulation (of the male especially) on the upper part emarginated: the four posterior thighs of the male very thick, of the female simple; *tarsi* of the male with the last joint on the under part with a small horn or protuberance.

Sp. 1. *Cim. europæa.* Head and thorax black: abdomen blueish-black; the apex only yellow or ferruginous: antennæ and tarsi yellow: femora and tibiæ blueish-black: wings brownish at the apex.

Tenthredo femorata. *Linné, Panzer.* Cimbex femorata. *Fabr., Latr.* Crabro lunulatus. *Fourc.* Cimbex europæa. *Leach.*

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Inhabits Europe: is rare in Britain, but has been taken near Dartford in Kent, and at Windsor.

Genus 401. TRICHIOSOMA. *Leach, Zool. Misc.* vol. iii.

Body hairy: *abdomen* with the first articulation (especially in the male) but slightly emarginated, the four posterior *thighs* dentated (in the male thick).

Sp. 1, *Tri. sylvaticum.* Black, and slightly shining: abdomen of a dull yellow or brownish, the base and apex black: femora blueish-black: tibiæ and tarsi yellowish: wings with the apex brownish.

Inhabits woods near London, but is rare.

Genus 402. CLAVELLARIA. *Lamarck, Leach.*

Body hairy or but slightly hairy: *abdomen* with the first articulation scarcely marginated: *femora of the four posterior legs* without dentations (of the male thickened).

Sp. 1. *Cla. marginata.* Black; apex of the antennæ, tibiæ, and tarsi yellow: abdomen with the margins of the posterior segments white.

Tenthredo marginata. *Linn., Panz.* Cimbex marginata *of authors.*

Inhabits woods in Europe: and has once occurred at Windsor.

Genus 403. ZARÆA. *Leach.*

Eyes of the male joining at the posterior part.

Sp. 1. *Zar. fasciata.* Black; tibiæ and tarsi yellow, the superior wings with a brownish band (abdomen of the female with the base white).

Tenthredo fasciata. *Linné, Panz.* Cimbex fasciata *of authors.*

Inhabits woods: is rare in Britain.

Genus 404. ABIA. *Leach.*

Abdomen of the male with an elongated, silky spot on the posterior part: *eyes* of the male nearly joining.

Sp. 1. *Abia nigricornis.* Antennæ black: wings from the middle to the apex with light brown spots: feet light red; thighs black and shining.

Tenthredo nitens (female). *Linn.* Cimbex sericea, var. *Fabr.* Abia nigricornis. *Leach.*

Inhabits woods.

Sp. 2. *Abia sericea.*

Tenthredo sericea. *Linné.*

Inhabits woods and furze on heaths.

Genus 405. AMASIS. *Leach.*

Body without spots: *abdomen* with the first articulation undivided.

Sp. 1. *Am. læta.* Back of the abdomen pale yellow, the first segment wholly black: wings at the base blackish.

Tenthredo læta. *Fabr., Panz.* Cimbex læta *of authors.* Amasis læta. *Leach.*

Inhabits England and Germany. It has once occurred near Bristol.

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Stirps 2.—*Antennæ* of a moderate length, composed of three articulations, filiform, the last joint increasing towards the apex (in the males ciliated or furcated): *wings* with one marginal and three submarginal cells: *body* short, and increasing towards its apex.

Genus 406. HYLOTOMA. *Fabr.*, *Leach.*

Upper wings with the marginal cell emitting a small branch: *antennæ* of the male ciliated: *tibiæ*, the four hinder ones furnished with a spine situated near the middle on the inner side.

Larva with fourteen spurious feet.

Sp. 1. *Hyl. pilicornis.* Body blueish-black: wings at the apex clouded: feet black, with white bands: antennæ rather lengthened, black and ciliated: the third submarginal cell increasing towards the apex.

Length of the body 2½ lines, expansion of the wings 6 lines.

Found in Coombe Wood, Surry, by Mr. Stephens.

Obs.—Of this genus we have several indigenous species.

Genus 407. CRYPTUS. *Jurine*, *Leach.*

Upper wings without the branch to the marginal cells: *antennæ* of the male divided and ciliated: the whole of the *tibiæ* simple.

Sp. 1. *Cryp. Villersii.* Bright yellow: head, antennæ, (and thorax of the male) black: wings brownish and transparent.

Tenthredo furcata. *Vill. Ent.* 3. 86. *t.* 7. *f.* 16. ♂ *f.* 17. ♀.—*Panz. Faun. Insect. Germ.* 46. 1. Tenthredo Rubi Idæi. *Illig.*, *Rossi*, *Fn. Etr.* 2. 31. Hylotoma furcata. *Fabr.*, *Latr.*, *Spinol.*, *Klug.* Cryptus furcatus. *Jurine.* Cryptus Villersii. *Leach*, *Zool. Misc.* vol. iii. 124.— ♀ Hylotoma Angelicæ. *Fabr. Syst. Piezat.* 25.—*Klug*, *Berl. Mag.* 1814, *p.* 302. Tenthredo melanocephala. *Panz.*

Inhabits France, Germany, and Italy. In England it is very rare.

Stirps 3.—*Antennæ* short, with nine or ten articulations, increasing in thickness in the middle, but ending in a point, the third articulation longer than the fourth: *body* short, and increasing towards the apex.

Genus 408. MESSA. *Leach.*

Upper wings with one marginal and four submarginal cells: *antennæ* with nine joints.

Sp. 1. *Messa hortulana.*

Tenthredo hortulana. *Klug.* Messa hortulana. *Leach.*

Inhabits

Genus 409. ATHALIA. *Leach.*

Upper wings with two marginal and four submarginal cells: *antennæ* with ten joints.

Sp. 1. *Ath. spinarum.* 2. *Ath. Rosæ.* 3. *Ath. annulata.*

Genus 410. SELANDRIA. *Leach.* Tenthredo, *Fam.* I. *Klug.*

Upper wings with two marginal and four submarginal cells: *antennæ* with nine joints.

Sp. 1. *Sel. serva.* 2. *Sel. cinereipes.* 3. *Sel. ovata.*

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Genus 411. FENUSA. *Leach.* TENTHREDO, *Fam.* II. †. *Klug.*

Upper wings with two marginal and three submarginal cells: *antennæ* composed of nine joints.

Sp. 1. *Fen. pumila.*

Tenthredo pumila. *Klug.* Fenusa pumila. *Leach.*

STIRPS 4.—*Antennæ* composed of nine joints, moderately long: *body* moderately long: *upper wings* with two marginal cells.

Genus 412. ALLANTUS. *Panz., Jurine, Leach.* TENTHREDINES ALLANTI. *Klug.*

Upper wings with four submarginal cells: *antennæ* with the third joint longer than the fourth.

Sp. 1. *All. semicincta.* 2. *All. notha.* 3. *All. zonata, &c.*

Genus 413. TENTHREDO. *Leach.* TENTHREDINES ALLANTI. *Klug.*

Upper wings with four submarginal cells: *antennæ* with the third joint of the same length with the fourth.

Sp. 1. *Tenth. Rapæ.* 2. *Tenth. dimidiata.* 3. *Tenth. nasata, &c.*

Genus 414. DOSYTHEUS. *Leach.* TENTHREDINES DOLERI. *Klug.*

Upper wings with three submarginal cells: *antennæ* with the first joint short, the third longer than the fourth.

Sp. 1. *Dos. Elanteriæ.* 2. *Dos. Junci, &c.*

Genus 415. DOLERUS. *Jurine, Latreille, Leach.* TENTHREDINES DOLERI. *Klug.* DOLERUS. *Jurine.*

Upper wings with three submarginal cells: *antennæ* with the first joint short; the third and fourth of equal length.

Sp. 1. *Dol. opacus.* 2. *Dol. Gonagra, &c.*

Genus 416. EMPHYTUS. *Leach.* TENTHREDINES EMPHYTI. *Klug.*

Upper wings with three submarginal cells: *antennæ* with the first and second joints equal; third and fourth equal.

Sp. 1. *Emph. cincta.* 2. *Emph. cerea.* 3. *Emph. tibialis, &c.*

STIRPS 5.—*Superior wings* with but one marginal cell: *body* short; of the males narrower towards the apex: *antennæ* simple, nine-jointed, slightly ciliated, gradually increasing in the middle, and decreasing towards the apex.

Dr. Leach has observed that from the shortness of the body, the one marginal cell, &c. it is probable that this is nearly allied to the second stirps.

Genus 417. CRÆSUS. *Leach.*

Upper wings with four submarginal cells: *antennæ* in both sexes longer than the body (especially in the females) with very short ciliæ: *posterior tarsi* with the first joint elongated and compressed.

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Sp. 1. *Cræs. septentrionalis.*

Nematus Septentrionalis. *Jurine, Latr., Leach.* Cræsus Septentrionalis. *Leach, Zool. Misc.* vol. iii. p. 129.

Inhabits woods.

Genus 418. NEMATUS. *Leach.*

Superior wings with four submarginal cells: *antennæ* simple, nine-jointed; longer than the body in the males, the last articulation generally increasing, or internally a little produced: *tarsi* simple.

Sp. 1. *Nem. niger.* 2. *Nem. luteus.* 3. *Nem. lucidus, &c.*

Genus 419. CLADIUS. *Leach.*

Upper wings with three submarginal cells: *antennæ* of the same length as the body or scarcely longer; of the males with very long ciliæ; the 3d, 4th, and 5th joints from the apex, or the 6th and 7th (especially) a little produced; the third joint from the base with a small protuberance: *tarsi* simple.

Sp. 1. *Cla. difformis.*

Inhabits England, but is rare; it has occurred at Coombe Wood in Surry, and near Bristol.

Stirps 6.—*Antennæ* with many articulations: *body* rather depressed: *wings* with two marginal and four submarginal cells.

Genus 420. TARPA. *Fabr., Klug, Leach.* Megalodontes. *Latr., Spinola.* Diprion. *Schrank.*

Tibiæ, the four posterior armed on the inside with two spurs or spines.

Obs.—Abdomen with the posterior part of the first articulation with a membranaceous margin; the membrane pale.

Sp. 1. *Tar. Fabricii.* Black; head with two spots on the inner margin between the eyes: thorax with the anterior part angular; two stripes near the scutellum, and punctured; the membrane of the abdomen with two fasciæ, and a puncture on each side: anus with a white band: antennæ brown; the first two joints black: feet yellow; base of the coxæ of the four anterior feet black.

Tarpa Fabricii. *Leach.*

Length of the body 7 lines; expansion of the wings 12¼ lines. In the museum of Dr. Leach.

Sp. 2. *Tar. Klugii.* Black, with three spots between the eyes; those placed on the margin of the eyes broken: thorax with the anterior margin divided; two stripes near the scutellum, and punctured: abdomen with the 1st, 4th, 5th, 6th, 7th, and 8th joints at the posterior margins, with two yellow bands: antennæ with the second and last joint black, the others brown; feet reddish brown; tibiæ yellow; thighs of the four anterior legs black at their base.

Tenthredo cephalotes. *Fabr. Ent. Syst.* 2. 111. Tarpa cephalotes. *Fabr. Syst. Piezat.* 19. Tarpa plagiocephala. *Klug, Berl. Mag.* 1808, 270. *t.* 8. Tarpa Klugii. *Leach, Zool. Misc.* iii. 131.

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Length of the body 5—5¾ lines, expansion of the wings 10—11 lines.
Inhabits Germany and England: in the latter it is very rare, and has only been found near Bristol.

Genus 421. LYDA. *Fabr.*, *Spinol.*, *Klug.*, *Leach.* PAMPHILIUS. *Latr.*, *Leach*, *Edinb. Encycl.* vol. ix. 141. CEPHALEIA. *Jurine.*

Tibiæ, the four posterior furnished on the inside with a single spine near the middle and a double one beneath.
Larva with no spurious feet.
Lydæ. *Klug.*
Sp. 1. *Lyda Betulæ.* 2. *Lyda erythrocephala, &c.*

Genus 422. LOPHYRUS. *Latr.*, *Leach.* PTERONUS. *Jurine.* HYLOTOMA. *Fabr.* TENTHREDO. *Linn.*, *De Geer*, *Oliv.*, *Lam.*, *Panz.*

Antennæ pennated in the males; serrated in the females: *superior wings* with one marginal and three submarginal cells: *mandibles* tridentate.
Sp. 1. *Loph. Pini.*
Inhabits Europe: is very rare in Britain.

Fam. II. XIPHYDRIADÆ. *Leach.*

Abdomen sessile: *oviduct* composed of two lamellæ, which are serrated: *mandibles* more or less long, terminated by two strong teeth: *wings* with the three marginal cells complete: *labrum* obscure.
Larvæ with scaly feet, or at least not membranaceous.

Genus 423. CEPHUS. *Latr.*, *Fabr.*, *Panz.*, *Leach.* SIREX. *Linn.* ASTATUS. *Klug.* TRACHELUS. *Jurine.*

Mandibles exserted, longer than wide: *neck* long: *oviduct* exserted: *antennæ* inserted in the front between the eyes, gradually thicker externally.
Sp. 1. *Cephus pygmæus.* Latr.
Inhabits flowers in fields and hedges.

Genus 424. XIPHYDRIA. *Latr.*, *Fabr.*, *Panz.*, *Leach.* SIREX. *Linn.*

Mandibles exserted, longer than wide: *neck* long: *oviduct* exserted: *antennæ* setaceous, inserted above the clypeus.
Sp. 1. *Xiph. Camelus.*
Inhabits willow grounds.

Fam. III. UROCERIDÆ. *Leach.*

Abdomen sessile: *oviduct* filiform, exserted, or inclosed in a groove beneath the abdomen: *mandibles* short.

Genus 425. ORYSSUS. *Latr.*, *Fabr.*, *Jurine*, *Lam.*, *Klug*, *Panz.*, *Leach.* SPHEX. *Scopoli.*

Mandibles with their internal edge not dentated: *maxillary palpi* long and pendulous: *antennæ* filiform, compressed, inserted under the anterior margin of the clypeus: *superior wings* with one marginal cell,

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and two submarginal, the last incomplete: *oviduct* capillary, hidden in a longitudinal groove.

Sp. 4. *Orys. coronatus.*

Oryssus coronatus. *Fabr., Latr., Coquebert, Leach.* Oryssus Vespertilio. *Klug, Panz.* Sphex abietina. *Scopoli.*

Inhabits sandy places: taken by Dr. Leach in Darent wood in July.

Genus 426. UROCERUS. *Geoff., Oliv., Lam., Latr., Leach.* Sirex. *Linn., Fabr., Jurine, Panz.*

Mandibles dentated on their internal edge: *maxillary palpi* very small: *labial palpi* terminated by a very thick, hairy joint: *antennæ* gradually narrowing externally, inserted in the front, longer than the thorax: *superior wings* with two marginal and two submarginal cells complete: *abdomen* terminating in a point: *oviduct* exserted, composed of three parts, the outer ones valviform.

Sp. 1. *Uro. Gigas.* (*Pl.* 8. *fig.* 3.)

Sirex Mariscus. *Fabr.*(Male). Sirex Gigas Linné. *Fabr., Latr.* (Female).

Inhabits Europe: is rare in Britain.

Division II.—*Abdomen united to the thorax by a peduncle.*

Fam. IV. Evaniadæ. *Leach.*

Evaniales. *Latreille.*

Inferior wings with very distinct nervures: *antennæ* with 13 or 14 joints.

Genus 427. EVANIA. *Fabr., Oliv., Lam., Jurine, Panz., Leach.* Sphex. *Linn.* Ichneumon. *De Geer.*

Abdomen very small, much compressed, triangular or ovoid; abruptly pedunculated and inserted behind the metathorax.

Sp. 1. *Ev. appendagaster.* Fabr., Latr.

Found near Bristol and Swansea, but is very rare.

Genus 428. FŒNUS. *Fabr., Latr., Jurine, Panz., Leach.* Ichneumon. *Linn., Geoff., De Geer.* Gasteruption. *Latr.* (obsolete).

Neck elongate: *hinder tibiæ* clavate: *abdomen* a lengthened club.

Sp. 1. *Fœn. Jaculator.*

Fœnus Jaculator. *Fabr., Panz., Latr., Leach.* Ichneumon Jaculator. *Linn.*

Inhabits woods and hedges.

Fam. V. Ichneumonidæ. *Leach.*

Ichneumonides. *Latreille.*

Abdomen attached to the thorax by a part of its transverse diameter: *inferior wings* with very distinct nervures: *antennæ* with 21 joints or more: *mandibles* bidentate, or notched at their extremity.

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Division I.—*Abdomen with five very distinct segments.*

Subdivision 1.—*Superior wings with the first submarginal cell very large, the two discoidal cells situated longitudinally, one above the other.*

Genus 429. ICHNEUMON. *Latr., Leach.*

Maxillary palpi with very unequal joints; *oviduct* with its base not covered by a large scale, exserted.

[This Genus consists of several natural genera; but the characters are obscure, and are not yet fully understood. The following divisions are proposed by Latreille, who has submitted these insects to a scrupulous and daily investigation.

Division A.

Abdomen but little or not at all compressed.

Subdivision a.

Extremity of the abdomen of the female compressed and obliquely truncated: *oviduct* exserted.

1. * *Abdomen cylindric, with a very short peduncle.*

Genus Pimpla *of Fabricius.*

2. ** *Abdomen somewhat ovoid, with the peduncle long, slender, and arcuate.*

Genus Cryptus *of Fabricius.*

Subdivision b.

Extremity of the abdomen of the female slightly compressed, not obliquely truncated: *oviduct* scarcely prominent or exserted.

3. * *Abdomen cylindric, almost sessile.*

Genus Metopius *of Panzer.* Pelastes *of Illiger.*

4. ** *Abdomen almost fusiform or cylindric, gradually narrower towards the base; the peduncle not slender or arcuate.*

Genus Alomya *of Panzer.*

5. *** *Abdomen ellipsoid or ovalate, with the peduncle slender and arcuate.*

Genus Ichneumon *of Fabricius.*

Division B.

Abdomen very much compressed.

6. * *Apex truncate in the females.*

Genus Ophion *of Fabricius.*

7. ** *Abdomen with the apex pointed.*

Genus Banchus *of Fabricius.*]

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Subdivision 2.—*Superior wings with the first submarginal cell small, or of a moderate size; the two discoidal cells placed in a transverse line by the side of each other.*

Genus 430. BRACON. *Jurine, Fabr., Panz., Illiger, Spinoli, Latr., Leach.* ICHNEUMON. *Linn., Scopoli, Schrank.* VIPIO. *Latr.* (rejected name.)

Mouth produced into a rostrum: *superior wings* with the two first submarginal cells nearly equal, square.

Sp. 1. *Br. Desertor.*

Bracon Desertor. *Fabr., Latr., Leach.*

Inhabits woods.

Division II.—*Abdomen almost inarticulate, with but three distinct segments.*

Genus 431. SIGALPHUS. *Latr., Spinoli, Leach.* SPHÆROPYX. *Hoffmansegg.* CRYPTUS. *Fabr.* ICHNEUMON. *Fabr.* CHELONUS. *Jurine, Panz., Illiger.* BRACON. *Jurine.*

Sp. 1. *Sig. Irrorator.*

Sigalphus Irrorator. *Latr., Leach.* Cryptus Irrorator. *Fabr.*

Inhabits ————————.

Fam. VI. DIPLOLEPIDÆ. *Leach.*

DIPLOLEPARIÆ. *Latreille.*

Abdomen inserted to the thorax by a part only of its transverse diameter: *inferior wings* without distinct nervures: *body* not contractile into a sphere: *abdomen* compressed or depressed, scarcely pedunculated: *oviduct* filiform: *palpi* very short: *antennæ* filiform, straight, from 13 to 16 joints.

Genus 432. DIPLOLEPIS. *Geoff., Oliv., Panz., Illig., Leach.* CYNIPS. *Linné, Scopoli.*

Abdomen with the inferior part compressed, triangular-ovoid: *antennæ* filiform, joints cylindric.

Sp. 1. *Dip. Quercus-folii.*

Cynips Quercus-folii. *Linné.* Diplolepis Quercus-folii. *Latr.*

Inhabits the oak.

Genus 433. FIGITES. *Latr., Jurine, Leach.* CYNIPS. *Rossi.*

Abdomen with its inferior part compressed, triangular-ovoid: *antennæ* moniliform, thicker towards their extremities.

Sp. 1. *Fig. scutellaris.*

Figites scutellaris. *Jurine, Latr.* Cynips scutellaris. *Rossi.*

Inhabits France and England.

Fam. VII. CYNIPSIDÆ. *Leach.*

CYNIPSERA. *Latreille.*

Abdomen attached to the thorax by a part only of its transverse dia-

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meter: *inferior wings* without distinct nervures: *body* not contractile into a ball: *abdomen* compressed or depressed: *oviduct* filiform: *palpi* very short: *antennæ* broken, clavate, or gradually thicker externally, from six to twelve-jointed: *hinder feet* formed for leaping.

STIRPS 1.—*Hinder tibiæ* arcuated.

Genus 434. CHALCIS. *Fabr., Oliv., Panz., Jurine, Illig., Latr., Leach.* SPHEX. *Linné.* VESPA. *Linné.*

Abdomen ovoid-triangular, not sessile, terminated by a point: *superior wings* not folded, with the marginal and submarginal cells none, or obliterated: *maxillary palpi,* with the last joint but one shorter than the one before it.

Sp. 1. *Chal. clavipes.* (*Pl.* 8. *fig.* 6.)

Inhabits Europe. Is found on aquatic plants in Battersea fields in the month of June.

STIRPS 2.—*Hinder tibiæ* straight.

Genus 435. CYNIPS. *Geoff., Schæff., Fabr., Oliv., Walck., Latr., Leach.* ICHNEUMON. *Linné.*

Antennæ with cylindric joints: *abdomen* compressed; *oviduct* exserted.

Sp. 1. *Cyn. capræa.*

Inhabits?

Fam. VIII. CHRYSIDIDÆ. *Leach.*

CHRYSIDIDES. *Latreille.*

Abdomen attached to the metathorax by a portion only of its transverse diameter: *inferior wings* without distinct nervures: *body* not contractile into a ball.

STIRPS 1.—*Abdomen* semicylindric or semicircular, with five segments in the male, and four in the female: *thorax* attenuated in front, divided transversely by four segments.

Genus 436. CLEPTES. *Latr., Fabr., Panz., Jurine, Illiger, Spinoli, Leach.* SPHEX. *Linné, Vill.* CHRYSIS. *Oliv.* VESPA. *Geoff.* ICHNEUMON. *Rossi, Walck.*

Sp. 1. *Cle. semi-aurata.* Fabr., Latr.

Inhabits sand-banks.

STIRPS 2.—*Abdomen* semicylindric, truncated or rounded behind, often dentated, composed of three, sometimes of four joints: *thorax* semicylindric, divided by three transverse sutures: *metathorax* with the middle not elongated into a scutellum.

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Subdivision 1.—*Metathorax with the middle produced into a scutellum.*

* *Abdomen with the second segment larger than the others: palpi many-jointed.*

Genus 437. ELAMPUS. *Spinoli, Latr., Leach.* CHRYSIS. *Fabr., Jurine.* HEDYCHRUM. *Panz., Lepeletier.*

Mandibles dentated: *abdomen* terminated by an obtuse point; the second segment larger than the others.

Sp. 1. *El. Panzeri.*

Elampus Panzeri. *Spinoli.* Chrysis Panzeri. *Fabr.*

Inhabits walls. Taken at Exeter by Dr. Leach.

Subdivision 2.—*Metathorax with the middle not elongated into a scutellum.*

** *Abdomen with the third or fourth segment larger than the others: palpi two-jointed (and very small).*

Genus 438. CHRYSIS *of authors.* VESPA. *Geoff.*

Mandibles with one tooth on their internal edges: *abdomen* semicylindric, elongate; the last segment abruptly divided by an impression, with a transverse row of impressed dots.

Sp. 1. *Chr. ignita.* (*Pl. 8. fig. 7.*)

Inhabits sand-banks, posts, and walls. We have several species in this country that have been confounded with *Chr. ignita, &c.*

Genus 439. HEDYCHRUM. *Latr., Panz., Spin.* CHRYSIS, *Linn., Fabr., Illig., Lamarck.*

Mandibles bidentate on their internal edge: *abdomen* semicircular, with the extremity rounded; all the segments united.

Sp. 1. *Hed. auratum.*

Chrysis aurata. *Fabr.* Hedychrum auratum. *Leach.*

Inhabits sand-banks.

Section II. *ACULEATA.*

Oviduct none: *sting* or aculeus in the females having a communication with poisonous glands: *abdomen* attached to the thorax in all by a part only of its transverse diameter.

DIVISION I.—*Hinder feet not pollinigerous; their tarsi with the first joint cylindric, not much larger than the others, nor much compressed.*

LARVÆ omnivorous.

Subdivision 1.—*Ocelli or stemmata not distinct. Wings often wanting in the females and neuters.*

Fam. IX. FORMICADÆ. *Leach.*

FORMICARIÆ. *Latreille.*

Abdomen with a peduncle abruptly formed, with a scale on two knots:

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antennæ thicker towards their extremities, the first joint very long, more so in the females and neuters: *labrum* large, perpendicular, corneous.

These insects live in societies consisting of vast numbers. The males and the females are furnished with wings, the neuters being apterous.

Huber has written a work on the œconomy of these animals.

Genus 440. FORMICA *of authors.* Lasius. *Fabr.*

Peduncle of the abdomen formed of one simple scale: *sting* not punctorious: *poisonous glands* in the female and neuters: *antennæ* inserted in the front.

Sp. 1. *For. herculanea.*

Formica herculanea. *Latr., Leach.*

Inhabits woods, building a large nest with bits of sticks.

Fam. X. Mutilladæ. *Leach.*

Mutillariæ. *Latreille.*

Head large: *abdomen* somewhat conic or ovoid: *tibiæ* spinose: *maxillary palpi* as long or longer than the maxillæ: *antennæ* filiform, inserted in the middle of the face, longer than the head, the first joint not receiving the second: *superior wings* with three submarginal cells.

The insects of this family are solitary. The males are winged, the females apterous, and there are no neuters.

Genus 441. MUTILLA. *Linn., Fabr., Panz., Jurine, Illig., Spinola, Leach.* Sphex. *De Geer.* Apis. *Christus, Harris.*

Abdomen (of both sexes) ovoid and convex; the second segment large, somewhat campanulated: *thorax* of the females cubical, with no transverse sutures.

Sp. 1. *Mut. Europæa.* Linn., Fabr., Panz., Latr., Leach.

Inhabits sandy places.

Genus 442. MYRMOSA. *Latr., Jurine, Panz., Leach.* Mutilla. *Rossi.* Hylæus. *Fabr.*

Abdomen depressed, elliptic in the males, conic in the females: *thorax* composed of two segments, the anterior segment transverse.

Sp. 1. *Myrm. melanocephala.*

Myrmosa melanocephala. *Latr., Leach.*

Inhabits ————————

Subdivision 2.—*Ocelli distinct, smooth: wings never wanting.*

Fam. XI. Scoliadæ. *Leach.*

Scolietæ. *Latreille.*

Thorax with the first segment transverse-quadrate, or forming an arc: *feet* short, or moderately long; the hinder ones thick, spinulose, or

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strongly ciliated: *antennæ* shorter than the head and trunk: *superior wings* with the marginal cell detached from the apex, not doubled longitudinally: *maxillary palpi* long; with the joints very unequal.

Genus 443. TIPHIA. *Fabr., Panz., Illig., Jurine, Spinola, Leach.* Sphex. *Scopoli, Christus.* Bethyllus. *Panzer.*

Mandibles without teeth: *antennæ* shorter than the thorax in both sexes, the first joint obconic: *abdomen* ovate.

Sp. 1. *Tiph. femorata.*

Inhabits flowers, and sandy situations.

Fam. XII. Sapygidæ. *Leach.*

Thorax with the first segment forming an arch, or a transverse square: *feet* moderate, or short, slender, not strongly ciliated or spined: *antennæ* in both sexes as long as the head and trunk: *superior wings* with the marginal cell not remote, not folded longitudinally.

Genus 444. SAPYGA. *Latr., Jurine, Klug, Illig., Spinola, Leach.* Apiis. *Linn.* Vespa. *Geoff.* Hellus. *Fabr., Panz.* Sphex. *Villers.*

Mandibles very strong, trigonate, many-toothed: *antennæ* thicker towards their extremities.

Sp. 1. *Sap. sexpunctata.*

Sapyga sexpunctata. *Leach.* Hellus sexpunctatus. *Fabr.*

Inhabits palings.

Fam. XIII. Pompilidæ. *Leach.*

Pompilii. *Latreille.*

Thorax with the first segment forming an arch, or a transverse square: *feet* long; the hinder ones as long as the head and trunk: *antennæ* slender, formed of elongate and slightly serrated joints: *superior wings* not folding longitudinally.

Stirps 1.—*Superior wings* with three submarginal cells complete.

Genus 445. POMPILUS. *Latr., Leach.*

Maxillary palpi longer than the labial ones, with the last joint thicker, conic-obovate; the three last joints nearly equally long: *labrum* inserted under the clypeus: *antennæ* (of the females at least) with their points convoluted.

Obs.—This is an artificial genus, and contains several natural genera.

Sp. 1. *Pom. annulatus.*

Pompilus annulatus. *Latr., Fabr., Leach.*

Inhabits ————

Genus 446. CEROPALES. *Latr., Fabr., Jur., Panz., Spinola, Leach.* Evania. *Oliv., Villers, Rossi, Cuvier.*

Maxillary palpi pendulous, longer than the labial ones; the three last

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joints equally long, the last joint thicker, conic-obovate: *labrum* entirely exserted, entering to the anterior margin of the clypeus: *antennæ* (in both sexes) thick, rigid, with the middle arcuated, not convoluted.

Sp. 1. *Cer. maculata.*

Ceropales maculata. *Fabr., Latr., Leach.*

Inhabits ————————

STIRPS 2.—*Superior wings* with two complete submarginal cells.

Genus 447. APORUS. *Spinola, Latr., Leach.*

Superior wings with the second submarginal cell receiving two recurrent nervures.

Sp. 1. *Apo. unicolor.*

Aporus unicolor. *Spinola, Latr., Leach.*

Inhabits ————————

Fam. XIV. SPHECIDÆ. *Leach.*

Thorax with the first segment transverse-linear: *feet* long; the hinder ones as long as the head and trunk: *ocelli* distinct: *superior wings* not folding longitudinally: *mandibles* with their internal edge denticulated.

Genus 448. AMOPHILA. *Kirby, Latr., Leach.* SPHEX. *Linn., De Geer, Panz., Lamarck, Cuv., Jurine, Illig., Spinola.* PEPSIS. *Fabr., Spinola.* MISCUS. *Jurine.*

Antennæ inserted about the middle of the face: *maxillæ and labrum* much longer than the head, bent in the middle: *palpi* very slender, with cylindric joints.

Sp. 1. *Amoph. sabulosa.*

Sphex sabulosa. *Linné.* Amoph. sabulosa *Kirby, &c.*

Inhabits sandy places.

Genus 449. SPHEX. *Linn., Fabr., Cuv., Lam., Jur., Illig., Leach.* ICHNEUMON. *Geoff.* APIS. *Linn.* PRO-APIS. *De Geer.* PEPSIS. *Fabr., Spinola.*

Antennæ inserted about the middle of the face: *maxillæ and labrum* scarcely longer than the head, and bent towards their extremities: *maxillary palpi* with all the joints elongate and obconic.

Sp. 1. *Sphex flavipennis.*

Pepsis flavipennis. *Fabr.* Sphex flavipennis. *Latr., Leach.*

Inhabits sandy places.

Genus 450. DOLICHURUS. *Latr., Leach.* PISON. *Jurine.* POMPILUS, *Spinola.*

Antennæ inserted at the mouth (at the base of the clypeus?): *maxillary palpi* setaceous, longer than the labial ones.

Sp. 1. *Dol. ater.*

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Pompilus corniculus. *Spinola.* Dolichurus ater. *Latr., Leach.*
Inhabits ————————

Fam. XV. LARRADÆ. *Leach.*

LARRATÆ. *Latreille.*

Thorax with the first segment transverse-linear: *feet* short, or moderately long: *labrum* entirely concealed, or but very obscure: *eyes* elongate, reaching the hinder margin: *ocelli* very distinct: *antennæ* inserted near the mouth, the first joint obovoid or inserted in the middle of the face: *superior wings* not folding longitudinally.

STIRPS 1.—*Superior wings* with two or three submarginal cells complete.

a. *Eyes entire, not emarginate. Mandibles without an emargination on their internal edge.*

* *Antennæ thicker externally: eyes separate.*

Genus 451. GORYTES. *Latr., Illig., Spin., Leach.* MELLINUS. *Fabr., Walck.* VESPA. *Linn., Geoff.* SPHEX. *Rossi.* ARPACTUS. *Jurine, Panz.* OXYBELUS. *Fabr.*

Antennæ inserted below the middle of the face: *mandibles* unidentate: *superior wings* with the second submarginal cell sessile.

Sp. 1. *Gor. quinquecinctus.*
Gorytes quinquecinctus. *Latr., Leach.*
Inhabits ————————.

Genus 452. PSEN. *Latr., Jurine, Panz., Illig., Leach.* TRYPOXYLON. *Fabr.*

Antennæ thicker externally, inserted in the middle of the face, towards the front: *eyes* separate: *abdomen* with the peduncle abrupt and short.

Sp. 1. *Psen ater.* Latr.
Inhabits posts and sandy places.

** *Antennæ filiform: eyes meeting behind.*

Genus 453. ASTATA. *Latr., Spinola, Leach.* SPHEX. *Villers, Rossi.* DIMORPHA. *Jurine, Panz., Illig.*

Antennæ inserted towards the mouth at the base of the clypeus.

b. *Eyes entire, not emarginate: mandibles emarginate on their internal edge.*

* *Superior wings with three submarginal cells.*

Genus 454. LARRA. *Fabr., Oliv., Jurine, Panz., Spinola, Latr., Leach.* LIRIS. *Fabr., Illig.* SPHEX. *Villers, Rossi.*

Antennæ filiform: *superior wings* with the third submarginal cell narrow, almost lunate: *mandibles* without a tooth-like process on their internal edge.

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Sp. 1. *Lar. ichneumoniformis.*
Larra ichneumoniformis. *Panz., Fabr., Latr., Leach.*
Inhabits ————.

Genus 455. LYROPS. *Illig., Latr., Leach.* TACHYTES. *Panz.* LARRA. *Fabr., Jurine.* LIRIS. *Fabr.* ANDRENA. *Rossi.*

Antennæ filiform: *superior wings* with the third submarginal cell narrow, almost lunate: *mandibles* with a strong tooth on their internal edge.

Sp. 1. *Lar. tricolor.*
Larra tricolor. *Fabr.* Tachytes tricolor. *Panz.* Lyrops tricolor. *Leach.*
Inhabits ————.

** *Superior wings with two submarginal cells.*

Genus 456. DINETUS. *Jurine, Panz., Illiger, Latr., Leach.* SPHEX. *Schæffer.* POMPHYLUS. *Fabr.* CRABRO. *Rossi.*

Antennæ (of the males) moniliform, terminated by elongate, cylindric joints convoluted in the middle: *mandibles* acutely unidentate on their internal edge: *superior wings* with the marginal cell appendiculated; the two submarginal cells sessile.

Sp. 1. *Din. pictus.*
Dinetus pictus. *Jurine, Panz., Latr., Leach.*
Inhabits the vicinity of Windsor, and has been taken near Swansea.

c. *Eyes notched.*

Genus 457. TRYPOXYLON. *Latr., Fabr., Panz., Illig., Spinola, Leach.* SPHEX. *Linné, Vill., Cuv., Rossi.* APIUS. *Jurine.*

Superior wings with three submarginal perfect cells; the first distinct, receiving a recurrent nervure; the second obsolete, much smaller, receiving another nervure; the third also obsolete, terminal: *abdomen* long and gradually pedunculated.

Sp. 1. *Figulus.* Latr.
Inhabits ————.

STIRPS 2.—*Superior wings* with one complete submarginal cell.

Genus 458. OXYBELUS. *Latr., Fabr., Panz., Jurine, Illig., Spinola, Leach.* VESPA. *Linn., Villers, Christus.* SPHEX. *Schæff.* CRABRO. *Oliv., Rossi.*

Antennæ thicker towards their extremities, longer than the head; convoluted, the second joint much shorter than the third: *mandibles* without teeth at their extremities; *tibiæ* spinose: *tarsi* with large pulvilli.

Sp. 1. *Oxy. uniglumis.*
Vespa uniglumis. *Linn.* Oxybelus uniglumis. *Fabr., Latr., Leach.*
Inhabits ————.

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Fam. XVI. Crabronidæ. *Leach.*

Crabronites. *Latreille.*

Thorax with the first segment transverse-linear: *feet* short, or moderately long: *labrum* entirely concealed, or but obscure: *eyes* not reaching the hinder part of the head: *ocelli* very distinct: *superior wings* not folded longitudinally: *antennæ* inserted at the mouth, with the first joint cylindric or conic, or towards the middle of the face.

Stirps 1.—*Superior wings* with one or two complete submarginal cells.

* *Mandibles with their extremities bifid. Superior wings with but one recurrent nervure.*

Genus 459. CRABRO. *Fabr., Oliv., Rossi, Jurine, Panz., Illig., Spinola, Leach.* Sphex. *Linné, Villers.*

Antennæ with the first joint long and cylindric: *superior wings* with one complete sub-marginal cell.

Sp. 1. *Cra. cribarius.* Fabr., Latr.

Inhabits sand-banks.

Genus 460. STIGMUS. *Jurine, Panz., Illiger, Spinola, Latr., Leach.*

Antennæ with the first joint obconic: *superior wings* with two complete submarginal cells, and two discoidal cells.

Sp. 1. *Stig. ater.*

Stigmus ater. *Jurine, Latr., Leach.*

Inhabits ——————?

** *Mandibles strong, many-toothed: superior wings with two recurrent nervures.*

Genus 461. PEMPHEDRON. *Latr., Fabr., Spinola, Leach.* Cemonus. *Jurine, Panz., Illiger.*

Superior wings with the submarginal cell not narrower towards the apex: *antennæ* with the first joint longest, thickest.

Sp. 1. *Pem. unicolor.*

Pemphedron unicolor. *Latr., Leach.* Cemonus unicolor. *Jurine.*

Inhabits ——————?

Stirps 2.—*Superior wings* with three complete submarginal cells.

* *Antennæ inserted at the mouth, filiform: clypeus not trilobate.*

Genus 462. MELLINUS. *Fabr., Panz., Jurine, Illig., Spinola, Leach.* Sphex. *De Geer, Cuv., Vill.* Vespa. *Linné, Rossi, Harris.*

Abdomen distinctly pedunculated: *tarsi* terminated by a thick joint bearing a large pulvillus.

Sp. 1. *Mel. mystaceus.*

Inhabits sand-banks.

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** *Antennæ thicker towards their extremities, inserted about the middle of the face: clypeus trilobate.*

Genus 463. CERCERIS. *Latr., Illig., Spinola, Leach.* Sphex. *Schæffer, Villers, Rossi.* Vespa. *Geoff., Oliv., Harris.* Philanthus. *Fabr., Jurine, Panz.* Bembex. *Rossi.* Crabro. *Rossi.*

Antennæ gradually thicker externally, very much approximating at their base, almost as long as the thorax, the third joint somewhat cylindric: *mandibles* with a tooth in their internal edge: *superior wings* with the second submarginal cell petiolated.

Sp. 1. *Cer. quadricinctus.*

Philanthus quadricinctus. *Fabr., Panz.* Cerceris quadricinctus. *Leach.*

Inhabits ——————?

Fam. XVII. Vespadæ. *Leach.*

Vespariæ. *Latreille.*

Superior wings folded longitudinally: *thorax* with the first segment forming an arc, prolonged behind even to the origin of the superior wings: *antennæ* twelve-jointed, with their extremities pointed: *lip* with three glandiferous divisions, or with four long plumose setæ.

Stirps 1.—*Mandibles* longer than broad, anteriorly meeting like a rostrum: *clypeus* cordiform, with the point porrected, and more or less truncated: *lip* having four glandular points at its extremity, parted into three pieces, the middle one large, and bifid or notched at its extremity: *superior wings* doubled, three submarginal cells complete: *maxillary palpi* six-jointed, not very much shorter than the labial ones.

Genus 464. ODYNERUS. *Latr., Leach.* Vespa. *Panz., Fabr.*

Abdomen ovoid-conic, the second segment broader than the first: *maxillary palpi* with the two or three first joints extending beyond the extremity of the maxillæ: *maxillæ* with the terminal lobe short, short-lance-shaped.

Sp. 1. *Ody. parietinus.*

Vespa parietina. *Fabr.*

Inhabits walls.

Stirps 2.—*Mandibles* longer than broad, long quadrate, with their extremities obliquely truncated: *clypeus* almost quadrate: *lip* with the intermediate division a little lengthened, cordiform.

Genus 465. VESPA *of authors.*

Mandibles (at least of the females and neuters) with the second tooth much broader than the two under ones, the upper one obtuse: *clypeus* with the anterior margin broadly truncate, and somewhat emar-

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ginate, with a tooth on each side: *abdomen* ovoid-conic, with the base abruptly truncated, and very shortly pedunculated.

Sp. 1. *Vespa Crabro* (hornet). (*Pl.* 8. *fig.* 8.)
Vespa Crabro. *Linné*, &c.
Inhabits Europe, building its nest in hollow trees.

Sp. 2. *Vespa vulgaris* (common wasp).
Vespa vulgaris *of authors.*
Inhabits Europe, building its nest in holes under ground.

Sp. 3. *Vespa Britannica.*
Vespa Britannica. *Leach, Zool. Miscel.* vol. i.
Inhabits Britain, and builds a nest suspended from trees.

Division II.—*Hinder feet pollinigerous; their tarsi with the first joint compressed, elongate-quadrate or obtrigonous.*

Fam. XVIII. ANDRENIDÆ. *Leach.*

ANDRENETÆ. *Latreille.*

LARVÆ pollinivorous.

Lip with the apex subcordate or subhastate, on each side with one auricle; nearly straight, or slightly incurved in some, reflexed in others, shorter than the sheathing tube: *palpi* alike.

STIRPS 1.—*Lip* with the apex dilated, somewhat cordiform.

Genus 466. COLLETES. *Latr., Illig., Spinola, Leach.* APIS. *Linné, Oliv., Villers.* ANDRENA. *Fabr., Jurine.* HYLÆUS. *Cuv.* EVODIA. *Panz.* MELITTA. * *a. Kirby.*

Hinder feet pollinigerous: *superior wings* with three submarginal cells: *antennæ* with the third joint longer than the second: *abdomen* much elongated, more or less villose: *ocelli* forming a curved line: *tongue* obtuse, the apex bilobate.

Sp. 1. *Col. succincta.* Latr.
Melitta succincta. *Kirby.* Evodia calendarum. *Panz.*
Inhabits ————————.

STIRPS 2.—*Lip* with the intermediate process lanceolate, acute.

a. *Lip when at rest deflexed.*

* *Superior wings with two submarginal cells.*

Genus 467. DASYPODA. *Latr., Fabr., Panz., Illig., Spinola, Klug, Leach.* ANDRENA. *Rossi.* APIS. *Christus.* TRACHUSA. *Jurine.* MELITTA. *Kirby.*

Maxillæ inflexed at their middle, or below, their terminal process triangular-lanceolate, and longer than their palpi: *hinder feet* with the first joint of their tarsi as long or longer than the tibiæ.

Sp. 1. *Das. plumipes.*

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Dasypoda plumipes. *Panz., Leach.* Melitta Swammerdamella. *Kirby.*
Inhabits Europe. It was first noticed by the illustrious Swammerdam. They burrow in sandy soil, throwing up a heap of sand without their hole.

** *Superior wings with three submarginal cells, the second small.*

Genus 468. ANDRENA. *Fabr., Panz., Jurine, Illig., Spinola, Klug, Leach.* APIS. *Linn., Vill.* MELITTA. ** c. *Kirby.*

Maxillæ bent at their extremity, their terminal lobe scarcely longer than broad: *hinder feet* with the first joint of their tarsi shorter than the tibiæ: *labium* or lip little elongate, shorter than its palpi.

Sp. 1. *And. nigro-ænea.*
Melitta nigro-ænea. *Kirby.*
Inhabits the blossoms of sallows in the spring.

OBS.—The species of this genus are extremely numerous, and a very large portion of them inhabit Britain. Their proboscis is downy and thick. The hinder legs of the male are furnished with a flocculus at their base, the tibiæ with a thick scopa or brush, and their anus is covered by a fringe of hairs. They nidificate under ground in a light soil, some choosing banks over which bushes are scattered, others bare perpendicular sections, but all seem to prefer a southern aspect. They excavate burrows of a cylindric form, from five inches to nearly a foot or more in depth, of such diameter only as to admit the insect. In making these holes they remove the earth grain by grain, which they throw up on the outside of their holes in the form of a hillock. Some species penetrate in a horizontal, and others in a perpendicular direction. They construct a cell at the bottom of this hole, which they replenish with pollen made into a paste with honey, and in this they deposit their eggs. The pollen they carry in the scopa or brush of their hinder tibiæ, upon the flocculus at the base of the hinder thighs, and on the hairs of the metathorax. When the female has committed her egg to the paste, she very carefully stops the mouth of her hole, to prevent the ingress of ants, or of other insects which might be enemies to the larva.

Genus 469. CILISSA. *Leach.* MELITTA. *Kirby.* ANDRENA. *Latr., Panz.*

Maxillæ bent near their middle, the terminal process very much longer than broad: *lip* elongate, longer than its palpi: *superior wings* with three submarginal cells, the second small.

OBS.—This genus is not only distinguished from *Andrena* by the characters of the lip and maxillæ, but also by having a longer tongue with very minute auricles, and the tops of the valves cultriform.

Sp. 1. *Cil. tricincta.*

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Melitta tricincta. *Kirby.* Andrena tricincta. *Latr.* Cilissa tricincta. *Leach.*
Inhabits ——————.

Stirps 2.—*Lip* with the intermediate division incurved, or nearly straight: *superior wings* in all with three complete submarginal cells.

* *Lip with the intermediate division nearly straight, not twice the length of the head.*

Genus 470. SPHECODES. *Latr., Leach* Sphex. *Linné, Villers, Rossi.* Apis. *Geoff.* Proapis. *De Geer.* Nomoda. *Fabr.* Andrena. *Oliv., Panz., Jurine, Spinola.* Dichroa. *Illig., Klug.* Melitta. ** a. *Kirby.*

Labrum trigonate, of the male entire, of the female generally emarginate: *antennæ* of the males long, almost moniliform, arcuated: *abdomen* with the greater portion smooth.

Obs.—The species of *Sphecodes*, at first sight, bear a near resemblance to *Sphex*. They make their nests in bare sections of banks exposed to the sun, and nearly vertical. According to Reaumur, they excavate to the depth of nine or ten inches, and deposit their eggs in a mass of pollen mixed with honey.

Sp. 1. *Sph. gibbus.*
Melitta gibba. *Kirby.*
Inhabits Europe.

** *Lip with the intermediate division incurved, longer than the lateral ones, and twice as long or more than the head.*

Genus 471. HYLÆUS. *Fabr., Illig., Spinola, Klug, Leach.* Apis. *Linné, Villers, Rossi.* Andrena. *Oliv., Panz., Jurine, Spinola.* Melitta. ** b. *Kirby.* Halictus. *Latr.*

Lip lanceolate, little sericeous: *hinder feet* in both sexes alike: *anus* of the females with a longitudinal groove above.

The males of this genus are remarkable for an elongate cylindric body. The wings of many of the species are beautifully iridescent. They nidificate in bare banks.

Sp. 1. *Hyl. quadri-cinctus.*
Apis 4-cincta. *Linné.*
Inhabits the vicinity of London, but is rare.

Fam. XIX. Apidæ. *Leach.*

Lip with the apex inflected, the intermediate lacinia filiform, and very long: *labial palpi* with the two first joints resembling a compressed seta.

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STIRPS 1.—*Hinder tarsi* with the first joint nearly equally broad, or gradually narrowing from the base to the apex, the second joint originating from the middle of its apex.

A. *Palpi alike.*

Genus 472. PANURGUS. *Panz., Spinola, Latr., Leach.* APIS. *Scopoli.* DASYPODA. *Illig., Fabr.* APIS. * a. *Kirby.* ERIOPS. *Klug.*

Mandibles not dentated: *antennæ* straight in both sexes, and subclavate: *superior wings* with two submarginal cells: *ocelli* disposed in a triangle.

Sp. 1. *Pan. Banksianus.*

Apis Banksiana. *Kirby.*

Inhabits ————————.

B. *Palpi unequal; the labial palpi setiform.*

a. *Labrum nearly quadrate, transverse, or not much longer than broad. Mandibles tridentate at their points.* (*Superior wings with three submarginal cells.*)

Genus 473. CERATINA. *Latr., Jurine, Spinola, Leach.* APIS. *Villers, Rossi, Kirby* (** d. 2 α). MEGILLA. *Fabr., Illig.* PROSOPIS. *Fabr.* PITHITIS. *Klug.* CLAVICERA. *Walckenaer.*

Labrum almost quadrate, perpendicular, entire: *antennæ* gradually thickening towards their extremities; the scapus not large.

Sp. 1. *Cer. cærulea.*

Apis cærulea. *Vill.* Apis cyanea. *Kirby.*

Inhabits the flowers of the Ragwort.

b. *Labrum longer than broad, inclined perpendicularly; porrect beneath the mandibles; elongate, quadrate. Mandibles strong, porrected, with the apex bidentate in some; trigonate and often multidentate in others.*

* *Labial palpi with the three first joints contiguous; the fourth inserted under the external apex of the third.*

Genus 474. CHELOSTOMA. *Latr., Leach.* APIS. *Linné, Vill., Kirby* (** c. 2 γ). HYLÆUS. *Fabr.* ANTHROPHORA. *Illig., Fabr.* ANTHIDIUM. *Panz.* TRACHUSA. *Jurine.*

Mandibles (of the females) arcuated; their apex bidentate or furcate, porrect, internally hairy: *maxillary palpi* three-jointed.

The bodies of the insects composing this genus are very long, slender, and cylindric. The belly of the male, near the anus, is concave, and covered with down, and at its base is a horn or protuberance. When asleep they roll themselves up like an armadillo, the horn or protuberance fitting into the anal cavity. They nidificate in posts and rails. The males usually repose in the centre of a flower.

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Sp. 1. *Che. florisomne.*

Hylæus florisomnis. *Fabr., Panz.* Apis florisomnis. *Linn.* Chelostoma florisomne. *Latr., Leach.*

Inhabits various flowers in hedges.

The female is *Apis maxillosa* of Linné and Kirby; *Hylæus maxillosus* of Fabricius.

** *Labial palpi with the third joint inserted obliquely on the internal side of the second, near to the apex.*

Genus 475. HERIADES. *Spinola, Latr., Leach.* APIS. *Kirby* (** c. 2 γ). ANTHOPHORA. *Fabr., Illig., Klug.* ANTHIDIUM. *Panz.* TRACHUSA. *Jurine.*

Labial palpi with the second joint longer than the first: *body* very long, cylindric.

This genus in habit and economy resembles *Chelostoma.*

Sp. 1. *Her. truncorum.*

Heriades truncorum. *Spinola, Latr., Leach.* Anthophora truncorum. *Fabr., Illig.*

Inhabits

Genus 476. STELIS. *Panz., Leach.* APIS. *Kirby* (** c. 1 β). ANTHOPHORA. *Illig.* MEGACHILE. *Latr., Walck.* TRACHUSA. *Jurine.* GYRODROMA. *Klug.*

Labial palpi with the second joint not longer than the first: *maxillary palpi* two-jointed, the first joint longest: *mandibles* strong: *abdomen* convex above, smooth below, and scarcely hirsute.

Sp. 1. *Ste. punctulatissima.*

Inhabits

Genus 477. ANTHIDIUM. *Fabr., Panz., Klug, Latr., Leach.* APIS. *Linn., Geoff., Schæff., Kirby* (** c. 2 β). ANTHOPHORA. *Illig.* MEGACHILE. *Walckenaer, Spinola.* TRACHUSA. *Jurine.*

Labial palpi with their second joint not longer than the first: *maxillary palpi* one-jointed: *abdomen* of the females, below, very hairy; above, convex, incurved, the base broadly truncate: *mandibles* broad, multidentate. The anus of the males of this genus is always armed with spines.

Sp. 1. *Anth. manicatum.*

Anthidium manicatum. *Panz., Latr., Leach.* Apis manicata. *Kirby, Linné.*

Inhabits Europe in gardens.

Genus 478. OSMIA. *Panz., Spinola, Latr., Leach.* APIS. *Linné, Villers, Kirby* (** c. 2 δ). ANTHOPHORA. *Fabr., Illig., Klug.*

Labial palpi with the second joint not longer than the first: *maxillary palpi* four-jointed: *abdomen* convex above, hairy beneath in the females: *mandibles* broad.

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Sp. 1. *Osm. cornuta.*

Osmia cornuta. *Latr., Leach.* Apis bicornis. *Kirby.*

Inhabits Europe. This species selects the hollows of large stones for the purpose of nidificating.

Genus 479. MEGACHILE. *Latr., Walck., Spinola, Leach.* APIS. *Linn., Villers, Kirby* (** c. 2 *α*). ANTHOPHORA. *Fabr., Illig., Panzer, Klug.* TRACHUSA. *Jurine.* XYLOCOPA. *Fabr.* CENTRIS. *Fabr.*

Labial palpi with the second joint not longer than the first: *maxillary palpi* two-jointed, the first rather longest: *mandibles* very strong: *abdomen* triangular, flat above, very downy beneath in the females.

"The insects of this genus are well known by the name of *leaf cutters* and *carpenter bees*: their interesting economy having attracted the attention of many naturalists, so early as 1670 it was noticed by Ray, Dr. Lister, Willughby, and Sir Edward King. Linné in this as in many other instances (supposing the economy of a genus to be peculiar to one species only) has confounded several species under the general title of *Apis centuncularis*, and denoted it by the orange-coloured hairs which cover the under side of the abdomen, a character which it possesses along with a great number of species."

Sp. 1. *Mega. centuncularis.*

Apis centuncularis. *Linn., Fourcroy, Klug.* Megachile centuncularis. *Latr., Leach.*

Inhabits Europe. Builds its cells with the leaves of roses and of the *Mercurialis annua.*

Genus 480. CÆLIOXYS. *Latr., Leach.* APIS. *Linné, Villers, Kirby* (** c. 1 *α*).

Labial palpi with their second joint not longer than the first: *maxillary palpi* two-jointed, the first double the length of the second: *mandibles* narrow and strong in both sexes: *scutellum* spiny: *abdomen* conic or triangular, very little or not at all downy: *anus* of the males spiny.

Sp. 1. *Cæl. conica.*

Apis conica. *Kirby.* Cælioxys conica. *Latr., Leach.*

Male

Apis quadripunctata. *Linn.* Anthophora quadridentata. *Fabr.*

Female

Apis conica. *Linn.*

Inhabits flowers.

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C. *Labrum a little broader than long, subsemicircular or semioval. Mandibles slender, pointed, unidentate on their internal edge. Abdomen not pollinigerous.*

* *Lip with the lateral divisions shorter than the palpi. Body simply pubescent.*

Genus 481. NOMADA. *Scop., Fabr., Illig., Klug, Spinola, Jurine, Panz., Leach.* Apis. *Linné, Villers, Kirby* (* b).

Superior wings with three submarginal cells complete: *maxillary palpi* six-jointed.

The history, economy, and mode of nidification of the insects of this genus (all of which are remarkable for the gaiety of their colours) as yet remain a secret. Dr. Leach has strong reasons for suspecting them to be parasitical; and this seems the more probable from their having no instrument for carrying pollen. Their flight is silent, unattended by any hum; they frequent dry banks. Their eyes, whilst living, exhibit through the external reticulated covering a surface of hexagons, which keeps shifting with the light.

Sp. 1. *Nom. ruficornis.*

Apis ruficornis. *Linn., Kirby.* Nomada ruficornis. *Fabr., Latr., Leach.*

Inhabits dry banks and sandy situations.

Genus 482. EPEOLUS. *Latr., Fabr., Illig., Jurine, Panz., Spinola, Klug, Leach.* Apis. *Linné, Kirby* (** b).

Superior wings with three complete submarginal cells: *maxillary palpi* one-jointed.

Sp. 1. *Epeo. variegatus.*

Epeolus variegatus. *Fabr., Panz., Latr.* Apis variegata. *Linné.*

Inhabits Europe, but is very local in Britain. I once met with this species in abundance in a sand-pit near Bexley, Kent.

** *Lateral divisions of the lip almost as long as the palpi. Body very villose in parts. Scutellum spinose. Superior wings with three submarginal cells.*

Genus 483. MELECTA. *Latr., Panz., Illig., Spinola, Leach.* Apis. *Linné, Kirby* (** a).

Maxillary palpi six-jointed, with five very distinct.

The insects of this genus are supposed to be parasitical.

Sp. 1. *Mel. punctata.* Latr.

Crocisa atra. *Jurine.* Apis punctata. *Kirby.*

Inhabits Europe. Is common near Swansea in South Wales.

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Stirps 2.—*Lip* with the apex generally hirsute, not inflected.

A. *Hinder feet of the females, with their tibiæ externally, and the first joint of the tarsi very hairy.*

a. *Maxillary palpi with more than four joints. Lip with its lateral divisions as long or longer than the labial palpi. Antennæ of the males very long.*

Genus 484. EUCERA. *Scop., Fabr., Latr., Panz., Spinola, Klug, Leach.* Apis. *Linné, Kirby* (** d. 1).

Maxillary palpi distinctly six-jointed: *superior wings* with two submarginal cells complete.

Sp. 1. *Eu. longicornis.*

Eucera longicornis. *Fabr., Panz., Latr., Leach.* Apis longicornis. *Linné, Kirby.*

Inhabits banks with a southern aspect.

* *Maxillary palpi with four joints or more. Lip with the lateral divisions shorter than the palpi. Superior wings with three submarginal cells complete: labial palpi setiform.*

Genus 485. ANTHOPHORA. *Latr., Spinola, Leach.*

Mandibles unidentated within: *maxillary palpi* six-jointed.

Sp. 1. *Anth. retusa.* (*Pl.* 8. *fig.* 9.)

Apis retusa. *Linné, Kirby.* Lasis pilipes. *Jurine.* Megilla pilipes. *Fabr.* Anthophora hirsuta. *Latr.* Anthophora retusa. *Leach.*

Inhabits sandy banks.

Genus 486. SAROPODA. *Latr., Leach.* Megilla. *Illig., Panz.,* Heliophila. *Klug.* Apis. *Kirby.*

Mandibles unidentate within: *maxillary palpi* five-jointed.

Sp. 1. *Saro. rotundata.*

Megilla rotundata. *Panz.* Saropoda rotundata. *Latr., Leach.*

Inhabits flowers on sandy heaths.

B. *Hinder feet with the tibiæ and the first joint of the tarsi shortly hairy.*

* *Hinder tibiæ terminated by two spurs or heels: superior wings with three submarginal cells in all, complete, the last neither linear nor oblique.*

Genus 487. BOMBUS. *Latr., Fabr., Illig., Panz., Spinola, Klug, Leach.* Apis. *Linné, Kirby* (** e. 2). Bremus. *Jurine.*

Labrum transverse: *proboscis* shorter than the body: *ocelli* disposed in a transverse straight line.

The *Bombi* usually nidificate in cavities beneath the ground, but many of the species (especially those of a fulvescent colour) construct their nest of moss on the surface. The females appear early

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in the spring when the willows are in bloom. The males are most abundant in the autumn.

Sp. 1. *Bom. terrestris.*

Bombus terrestris. *Fabr., Latr., Leach.* Apis terrestris. *Linn.*

Inhabits Europe.

** *Hinder tibiæ without spurs or heels. Superior wings with two or three submarginal cells, the last oblique or linear.*

Genus 488. APIS *of authors.*

Hinder tarsi with their first joint long: *superior wings* with three submarginal cells complete, the last oblique and linear.

Sp. 1. *Apis mellifica* (hive bee).

Apis mellifica *of authors.*

Inhabits Europe.

Order XIV. RHIPIPTERA. *Latr., Leach.*

Order STREPSIPTERA. *Kirby.*

Order HYMENOPTERA. *Rossi.*

" Xenos, the genus serving as the type of this singular order of insects, was discovered by Rossi, who referred it without hesitation to the Hymenoptera, and placed it next to Ichneumon. Another genus of the same order was found by Kirby, and was described in his celebrated *Monographia Apum Angliæ* under the name of *Stylops*, with expressions of doubt as to its systematic situation. Latreille soon after received from De Brebisson a species of Stylops, and at the end of his *Genera Insectorum et Crustaceorum*, observes, that it seems to disturb our entomological systems, not being referable to any of the established orders. Professor Peck detected a new species of this group in America, and communicated it to Kirby, who considered it to constitute with his Stylops a peculiar order of insects, on which he gave a dissertation to the *Linnean Society of London*, which was published in the eleventh volume of their *Transactions*. I adopted the characters that were laid down by this learned entomologist, as well as the name *Strepsiptera*, by which it was designated. Since then Latreille has convinced me that the supposed elytra are but moveable processes attached to the anterior part of the thorax; whereas true elytra arise from the second segment of the trunk, and always more or less cover the wings, which these parts do not touch. Anxious to become acquainted with all the characters of the order, I commenced an examination of the mouth, and was soon convinced that the parts of it were far from being obsolete; but fearing to undertake the dissection, I submitted the specimen to the inspection of Savigny, from whose exact and almost infallible hand and eye I felt confident of gaining the desired infor-

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mation. He observed that the mouth contains the whole of the usual parts which, under various modifications, exist in all insects: the mandibles are perfectly distinct from and unconnected with the maxillæ: the maxillæ are inserted behind, and somewhat below the mandibles, whose base they conceal; and the articulation of the labrum is very evident from its semitransparency." *Leach, Zool. Misc.* vol. iii.

Mr. Kirby, in the second volume of his *Monographia Apum Angliæ*, gives the following account of *Stylops Melitta*: "Upon this insect (*Melitta nigro-ænea*) I discovered, last spring, a very singular animal, which seems appropriated to the present genus. I had previously more than once observed upon other species something that I took to be a kind of *Acarus*, which appeared to be immovably fixed just at the inosculations of the dorsal segments of the abdomen; at length, finding three or four upon a specimen of *Melitta nigro-ænea*, I determined not to lose that opportunity of taking one off to examine and describe; but what was my astonishment when, upon my attempting to disengage it with a pin, I drew forth from the body of the *Melitta* a white fleshy larva, a quarter of an inch in length, the head of which I had mistaken for an *Acarus!* After I had examined one specimen, I attempted to extract a second; and the reader may imagine how greatly my astonishment was increased, when, after I had drawn it out but a little way, I saw its skin burst, and a head as black as ink, with large staring eyes and antennæ, consisting of two branches, break forth, and move itself briskly from side to side. It looked like a little imp of darkness just emerging from the infernal regions. My eagerness to set free from its confinement this extraordinary animal may be easily conjectured. Indeed I was impatient to become better acquainted with so singular a creature. When it was completely disengaged, and I had secured it from making its escape, I set myself to examine it as accurately as possible; and I found, after a careful inquiry, that I had not only got a non-descript, but also an insect of a new genus, whose very class seemed dubious." For further information on this Order I must refer the reader to the eleventh volume of the *Transactions of the Linnean Society*, *Sowerby's British Miscellany*, and *Leach's Zoological Miscellany*, vol. iii., all of which contain figures of the insects of this Order.

Order XV. DIPTERA. *Linné, Leach, Latr., &c.*

Class ANTLIATA. *Fabr.*

The insects composing this Order are distinguished from all other insects by the following characters. *Wings* two, naked, unprotected. *Halteres* (poisers or balancers) placed behind, and generally beneath

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the wings: *head* distinct from the thorax by an evident interval: *proboscis* (rarely wanting) univalve: *tarsi* with two simple nails.

Besides these characters may be noted some others, which are common to almost all dipterous insects. The *mouth* is for the most part furnished with a rostrum having no articulations. *Thorax* composed of but one segment, always distinct from the abdomen.

Fam. I. TIPULIDÆ. *Leach.*

TIPULARIÆ. *Latreille.*

Antennæ with many joints, filiform or setaceous, longer than the head.

STIRPS 1.—*Ocelli* none: *antennæ* very hairy: *eyes* large: *rostrum* tubular and long.

Genus 489. CULEX *of authors.*

Sp. 1. *Cul. pipiens* of authors (the common gnat). (*Pl.* 9. *fig.* 5.)

Inhabits water in the larva state.

STIRPS 2.—*Ocelli* none: *antennæ* very hairy: *eyes* large: *rostrum* very short, terminated by two lips: *two anterior legs* at a distance from the others.

Genus 490. CORETHRA. *Meig., Illig., Latr., Leach.*

Antennæ fourteen-jointed; the basilar joints conic-ovoid; of the male with fasciculi of hairs; with simple hairs on the females, the two last joints attenuated, elongated.

Sp. 1. *Cor. cuculiformis.* Meig.

Inhabits marshy places.

Genus 491. TANYPUS. *Meig., Illig., Latr., Leach.*

Antennæ fourteen-jointed, very plumose, moniliform, their extremities filiform; of the male, almost entirely moniliform, their last joint larger and ovoid in the female.

Sp. 1. *Tan. cinctus.*

Inhabits marshy places.

Genus 492. CHIRONOMUS. *Meig., Latr., Illig., Fabr., Leach.*

Antennæ twelve-jointed, very plumose, moniliform, with filiform extremities in the male, seven-jointed, the last joint elongate, cylindric in the female.

Sp. 1. *Chir. plumosus.* Meig.

Inhabits marshy places.

STIRPS 3.—*Ocelli* none: *antennæ* very hairy: *eyes* large: *rostrum* very short: *legs* at an equal distance from each other.

Genus 493. PSYCHODA. *Latr., Fabr., Leach.* TINEARIA. *Schell.* TRICHOPTERA. *Meig.*

Wings deflexed: *rostrum* shorter than the head. *antennæ* with fifteen or sixteen joints, of a globular form, covered with bundles of hairs.

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Sp. 1. *Psy. phalænoides.* Latr.
Inhabits moist places.

Genus 494. CECIDOMYIA. *Latr., Illig., Meig., Leach.* OLIGOTROPHUS. *Latr.*
Wings incumbent: *antennæ* moniliform, hairy.
Sp. 1. *Cec. lutea.* Meig.

STIRPS 4.—*Ocelli* none: *antennæ* with short hairs: *eyes* oval, entire *palpi* with their last joint very long: *lips* not inclined.

Genus 495. CTENOPHORA. *Meig., Illig., Latr., Fabr., Leach.* TANIPTERA. *Latr.*
Antennæ filiform; pectinated in the males, serrated in the females; the second joint short, the third elongate.
Sp. 1. *Cte. atrata.* Meig.
Inhabits moist places and meadows.

Genus 496. PEDICIA. *Latr., Leach.* LIMONIA. *Meig.*
Antennæ subsetaceous, simple; the two first joints larger, elongate; the three following turbinated, the three next globular, and the seven last slender, cylindric.
Sp. 1. *Ped. rivosa.*
Tipula rivosa. *Linné, Donovan.*
Inhabits moist places.

Genus 497. TIPULA *of authors.*
Antennæ subsetaceous, simple; the first joint largest, cylindric; the second subglobose; the next cylindric; the third elongate.
Sp. 1. *Tip. oleracea.* Linné. (*Pl. 9. fig. 2.*)
Inhabits Europe: the larva feeds on the roots of vegetables.

Fam. II. STRATIOMYDÆ. *Latreille.*

Haustellum with two setæ.

A. *Antennæ not terminated by a seta.*

STIRPS 1.—*Antennæ* with their last joints having eight rings.

Genus 498. BERIS. *Latr., Leach.*
Antennæ cylindric; the last joint cylindric-conic, elongate: *scutellum* with four or six spines: *palpi* very much shorter than the proboscis.
Sp. 1. *Beris nigritarsis.* Latr., Leach.
Inhabits palings and moist places.

STIRPS 2.—*Antennæ* with their last joint having from four to six rings, fusiform, cylindric-conic, or conic.

Genus 499. STRATIOMYS *of authors.*
Antennæ very much longer than the head; the first and third joints

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very long, the latter subfusiform, compressed, with five rings: *thorax* bispinose.

Sp. 1. *Stra. Chamæleon.* (*Pl.* 12. *fig.* 4.)

Inhabits marshy places.

Genus 500. ODONTOMYIA. *Meig., Illig., Latr., Leach.*

Antennæ a little longer than the head; the last joint cylindric-conic, with six rings: *thorax* bispinose.

Sp. 1. *Odont. furcata.*

Inhabits marshy places.

Genus 501. CLITELLARIA. *Meig., Illig., Leach.* EPHIPPIUM. *Latr.*

Antennæ a little longer than the head, with their last joint conic, six-ringed, the two last forming a little style: *thorax* bispinous, the spines erect.

Sp. 1. *Clit. Ephippium.* Meig.

Inhabits the skirts of woods: is rare in Britain.

Genus 502. NEMOTELUS *of authors.*

Antennæ half the length of the head, the third joint fusiform, four-ringed: *proboscis* sheathed beneath a rostelliform process on which the antennæ are inserted.

Sp. 1. *Nem. uliginosus.* Fabr., Leach.

Inhabits flowers in meadows.

B. *Antennæ terminated by a style or seta.*

STIRPS 3.—*Scutellum* spined.

Genus 503. OXYCERA. *Meig., Illig., Latr., Leach.*

Antennæ with their first and second joints forming a subfusiform club, the third styliform.

Sp. 1. *Ox. Hydroleon.*

Inhabits marshes and meadows.

STIRPS 4.—*Scutellum* without spines.

Genus 504. VAPPO. *Latr., Fabr., Leach.* PACHYGASTER. *Meig.*

Antennæ with their two first joints transverse; the second with the third joints forming a sub-hemispheric head.

Sp. 1. *Vap. ater.*

Inhabits hedges in lanes near Darent Wood in July.

Genus 505. SARGUS *of authors.*

Antennæ terminated by a seta longer than the antennæ, their second joint elongate: *abdomen* generally oblong.

Sp. 1. *Sargus cupreus.*

Inhabits umbelliferous flowers in marshes.

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Fam. III. TABANIDÆ. *Leach.*

TABANII. *Latreille.*

Haustellum with many setæ.

STIRPS 1.—*Wings* divaricating: *scutellum* without spines: *antennæ* as long or a little longer than the head.

Genus 506. TABANUS *of authors.*

Proboscis a little shorter than the head, terminated by large lips: *antennæ* as long as the head, the second joint cup-shaped, the third lunate-subulate, five-ringed: *ocelli* obsolete or wanting.

Sp. 1. *Tab. bovinus.*

Inhabits meadows.

STIRPS 2.—*Wings* divaricating: *scutellum* without spines: *antennæ* considerably longer than the head.

Genus 507. HÆMATOPOTA. *Meig., Illig., Latr., Fabr., Leach.*

Antennæ with the first joint elongate, incrassate, the second very short, cup-shaped; the third elongate-conic (longer than the first), tubulated, four-ringed: *ocelli* obsolete or wanting.

Sp. 1. *Hæm. pluvialis.* Meig. Tabanus pluvialis. *Linné.*

Inhabits woods and lanes, and is excessively troublesome to travellers.

Genus 508. CHRYSOPS. *Meig., Illig., Latr., Fabr., Leach.*

Antennæ with the two first joints of nearly an equal length, the third joint as long as both the others, cylindric-conic, five-ringed: *ocelli* three.

Sp. 1. *Chry. cæcutiens.*

Tabanus cæcutiens. *Linné.*

Inhabits woods, commons, and lanes.

a. *Proboscis (when at rest) entirely or partially prominent.*

* *Proboscis terminated by two large lips.*

Fam. IV. RHAGIONIDÆ. *Leach.*

RHAGIONIDÆ. *Latreille.*

Palpi prominent, cylindric-conic: *wings* divaricating: *antennæ* generally moniliform.

Genus 509. RHAGIO. *Oliv., Rossi, Cuv., &c.* LEPTIS. *Fabr.*

Antennæ moniliform, the third joint not ringed, but terminated by a seta: *palpi* porrect.

Sp. 1. *Rha. scolopaceus.* Latr.

Inhabits the trunks of trees.

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Genus 510. ATHERIX. *Meig., Latr., Leach.*

Antennæ moniliform; the third joint not ringed, but terminated by a seta: *palpi* erect.

Sp. 1. *Ath. maculata.* Meig.

Inhabits borders of woods.

Fam. V. DOLYCHOPODÆ. *Leach.*

DOLYCHOPODES. *Latreille.*

Palpi prominent, lamelliform: *wings* incumbent: *antennæ* patelliform.

Genus 511. DOLYCHOPUS. *Latr., Fabr., Walck., Leach.*

Antennæ half the length of the head; the third joint trigonal, bearing a seta on its hinder part.

Sp. 1. *Dol. nobilitatus.* Fabr., Leach.

Inhabits moist places in woods and commons.

Fam. VI. MYDASIDÆ. *Leach.*

MYDASII. *Latreille.*

Palpi not prominent.

Genus 512. THEREVA. *Latr., Leach.*

Antennæ as long or longer than the head; the last joint ovoid-conic, with a distinct style terminated by a seta.

Sp. 1. *Ther. plebeia.*

Inhabits commons and woods.

** *Proboscis terminated by very small lips.*

Fam. VII. ASILIDÆ. *Leach.*

ASILICI. *Latreille.*

Body long: *wings* incumbent: *antennæ* three-jointed.

STIRPS 1.—*Tarsi* terminated by two claws, and two pulvilli: *antennæ* as long, or not much longer than the head.

Genus 513. LAPHRIA. *Meig., Illig., Fabr., Latr., Leach.*

Antennæ with their first joint longer than the second; the last suboval, without a style.

There is a British species of this genus, but I do not know its specific name.

Genus 514. ASILUS *of authors.* ERAX. *Scopoli.*

Antennæ with their first joint longer than the second; the last elongate-conic, terminated by a very distinct style.

Sp. 1. *Asi. crabroniformis.* Fabr., Leach. (*Pl. 9. fig. 9.*)

Inhabits commons and heaths.

Genus 515. DASYPOGON. *Meig., Illig., Latr., Leach, Fabr.*

Antennæ with their two first joints nearly equal; the last sub-cylindric, terminated by a minute, articuliform, conic style.

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Sp. 1. *Dasyp. punctatus.* Meig., Leach.
Inhabits sandy commons.

STIRPS 2.—*Tarsi* terminated by two claws and two pulvilli: *antennæ* much longer than the head, inserted in a common footstalk.

Genus 516. DIOCTRIA. *Meig., Illig., Latr., Fabr., Leach.*
Sp. 1. *Dioc. Œlandica.* Fabr., Leach.
Inhabits the borders of woods.

STIRPS 3.—*Tarsi* terminated by three claws; pulvilli wanting.

Genus 517. GONYPES. *Latr., Leach.* LEPTOGASTER. *Meig.*
Abdomen very long, slender, thicker towards its extremity.
Sp. 1. *Gon. tipuloides.* Latr., Leach.
Inhabits ————————.

Fam. VIII. EMPIDÆ. *Leach.*

EMPIDES. *Latreille.*

Body long: *wings* incumbent: *antennæ* two-jointed: *proboscis* perpendicular.

Genus 518. EMPIS *of authors.*
Antennæ three-jointed, the last joint terminated by a seta; *palpi* erect.
Sp. 1. *Empis Borealis.* Fabr.
Inhabits ————————.

Fam. IX. ANTHRACIDÆ. *Leach.*

ANTHRACII. *Latreille.*

Body short: *wings* divaricating: *antennæ* distant, two or three-jointed: *head* as high as the thorax.

Genus 519. ANTHRAX *of authors.*
Palpi received into the cavity of the mouth: *proboscis* short, not porrect.
Sp. 1. *Anth. Hottentotta.*
Inhabits borders of woods on dry banks.

Fam. X. BOMBYLIDÆ. *Leach.*

BOMBYLIARIA. *Latreille.*

Body short: *wings* divaricating: *antennæ* contiguous, three-jointed: *head* lower than the thorax.

Genus 520. BOMBYLIUS *of authors.*
Proboscis longer than the head, pointed: *palpi* distinct: *antennæ* with their first joint much longer than the second.
Sp. 1. *Bomb. major* of authors. (*Pl. 9. fig. 10.*)
Inhabits open places in woods in the spring of the year.

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Fam. XI. ACROCERIDÆ. *Leach.*

INFLATA. *Latreille.*

Body short as if inflated: *wings* divaricating: *antennæ* three- or two-jointed.

b. *Proboscis (when at rest) retractile within the cavity of the mouth.*

Genus 521. ACROCERA. *Meig., Latr., Leach.*

Proboscis obscure: *antennæ* inserted on the vertex; two-jointed, the last joint terminated by a seta.

There is a British species of this genus.

Genus 522. OGCODES. *Latr., Leach.* HEXOPS. *Illig., Walck., Meig., Fabr.*

Proboscis obscure: *antennæ* inserted anteriorly over the cavity of the mouth; two-jointed, the last joint terminated by a seta.

Sp. 1. *Og. gibbosus.* Latr., Leach.

Inhabits Germany and England.

Fam. XII. SYRPHIDÆ. *Leach.*

SYRPHIÆ. *Latreille.*

B. *Haustellum with two setæ.*

STIRPS 1.—*Head* anteriorly conic-produced: *antennæ* much shorter than the head, placed in a common elevation: *oval cavity* on the nasal prominence: *wings* divaricating.

Genus 523. RHINGIA *of authors.*

Head anteriorly much produced, terminated by the proboscis.

Sp. 1. *Rhin. rostrata* of authors.

Inhabits flowers.

Genus 524. SERICOMYIA. *Latr., Leach.*

Antennæ with their setæ plumose, inserted at the dorsal juncture of the second and third joints; the last joint of the antennæ suborbicular.

Sp. 1. *Ser. Lapponum.* Latr., Leach.

Inhabits marshes, especially the bogs of Dartmoor, and the north of England, Scotland, and Ireland.

Genus 525. VOLUCELLA. *Geoff., Schæff., Latr., Leach.* PTEROCERA. *Meig.*

Antennæ with their last joint elongate; seta plumose, inserted at the dorsal juncture of the second and third joint.

Sp. 1. *Vol. pellucens.* Latr., Leach.

Inhabits woods in June and July.

Genus 526. ERISTALIS. *Latr., Fabr., Leach.* HELIOPHILUS. *Meig., Illig.*

Antennæ contiguous at their base, their last joint broader than long;

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seta (simple or slightly plumose) inserted beyond the dorsal junction of the second and third joints: *head* anteriorly distinctly rostriform.

Sp. 1. *Erist. Narcissi.*

Inhabits flowers in marshes.

Genus 527. HELOPHILUS. *Leach.* ELOPHILUS. *Meig., Illig., Latr.*

Antennæ contiguous at their base, their last joint broader than long; *seta* (simple or slightly plumose) inserted beyond the dorsal juncture of the second and third joints; head anteriorly distinctly rostriform.

Sp. 1. *Hel. tenax.* Latr., Leach.

Inhabits hedges, and is very common.

Genus 528. SYRPHUS *of authors.*

Antennæ separate at their base, their last joint suborbiculate: *seta* inserted beyond the dorsal junction of the second and third joints: *abdomen* elongate-subquadrate, gradually somewhat narrower towards its extremity.

Sp. 1. *Syr. Pyrastri.* Fabr.

Inhabits flowers.

Genus 529. DOROS. *Meig., Illig., Leach.*

Antennæ separate at their base; their last joint suborbiculate: *seta* inserted beyond the dorsal juncture of the second and third joints: *abdomen* subovate-trigonal; the length double the breadth.

Sp. 1. *Doros conopseus.*

Milesia conopsea. *Fabr.*

Inhabits fields, but is very rare.

STIRPS 2.—*Head* not anteriorly conic-produced: *antennæ* much longer than the head, placed on a common elevation: *oval cavity* on the nasal prominence: *wings* deflexed.

Genus 530. CHRYSOTOXUM. *Meig., Latr., Leach.*

Antennæ subcylindric, their last joint having a seta at its base.

Sp. 1. *Chrys. arcuatum.*

Musca arcuata. *Linné.*

Inhabits flowers.

Genus 531. CERIA. *Fabr., Latr., Illig., Meig., Leach.*

Antennæ with their first and second joints forming an oval mass terminated by a style.

There is one British species, that does not seem to have been described.

STIRPS 3.—*Head* not anteriorly produced: *nasal* part straight, not prominent: *antennæ* inserted separately, very much longer than the head: *wings* deflexed.

Genus 532. APHRITIS. *Latr., Leach.* MICRODON. *Meig.*

Antennæ with their third joint conic, elongate, its base bearing a seta.

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Sp. 1. *Aphr. auro-pubescens.* Latr., Leach.
Inhabits heaths.

Stirps 4.—*Head* not anteriorly produced; *nasal* part straight, not prominent: *antennæ* inserted separately, very much longer than the head: *wings* deflexed.

Genus 533. MILESIA. *Latr., Leach.*

Hinder thighs (of the males at least) large, very thick, elongate-ovato, denticulated beneath: *antennæ* with their last joint much compressed: *abdomen* trigonate.
Sp. 1. *Mil. annulata.* Leach.
Inhabits borders of woods.

Fam. XIII. Conopsidæ. *Leach.*

Conopsarii. *Latreille.*

Proboscis prominent, nearly cylindric or conic, without any remarkable dilatation: *antennæ* with their second joint as long or longer than the third, forming with it a fusiform or subovate-compressed club: *body* elongate.

Genus 534. CONOPS *of authors.*

Proboscis porrect: *ocelli* none: *antennæ* very much longer than the head: *apex* fusiform.
Sp. 1. *Con. aculeata.* Fabr., Leach.
Inhabits hedges and flowers.

Genus 535. ZODION. *Latr., Leach.*

Proboscis porrect: *ocelli* three: *antennæ* shorter than the head: *apex* subovoid.
Sp. 1. *Zo. conopsoides.* Latr., Leach.
Inhabits umbelliferous plants. Taken by Dr. Leach in Darent Wood in July.

Genus 536. MYOPA *of authors.* Stomoxoides. *Schæffer.*

Proboscis very long, filiform, geniculated beneath twice.

Sp. 1. *My. dorsalis.* Fabr., Leach.
Inhabits hedges and gardens.

Genus 537. BUCENTES. *Latr., Leach.*

Proboscis geniculated twice.

Sp. 1. *Buc. cinereus.* Latr., Leach.
Inhabits France and England.

Genus 538. STOMOXYS *of authors.*

Proboscis geniculated once.

Sp. 1. *Stom. calcitrans* of authors. (*Pl. 9. fig. 7.*)
Inhabits commons in the autumn.

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Fam. XIV. Muscidæ. *Leach.*

Muscides. *Latreille.*

Proboscis retractile, terminated by a very remarkable dilatation.

Stirps 1.—*Antennæ* inserted near the front, setigerous: *palpi* internal: *halteres* visible: *anterior legs* simple: *head* not subglobose: *hinder legs* not larger than the rest: *wings* horizontal: *eyes* sessile.

Genus 539. MOCILLUS. *Latr., Leach.*

Antennæ shorter than the head: *head* hemispheric.

Sp. 1. *Moc. cellarius.* Linné, Leach.

Inhabits wine-vaults.

Stirps 2.—*Antennæ* inserted near the front, setigerous: *palpi* internal: *halteres* visible: *anterior legs* simple: *head* not subglobose: *hinder legs* not longer than the rest: *wings* divaricating: *eyes* simple: *vertex* narrow.

Genus 540. TEPHRITIS. *Latr., Fabr., Illig., Leach.* Trypeta. *Meig.* Dacus. *Fabr.*

Thorax cylindric: *proboscis* entirely retractile.

Sp. 1. *Teph. Cardui.* Latr., Leach.

Inhabits thistles.

Stirps 3.—*Antennæ* inserted near the upper part of the head, setigerous: *palpi* internal: *halteres* visible: *anterior legs* simple: *head* not often subglobose: *hinder legs* not larger than the rest: *wings* deflexed: *eyes* sessile: *vertex* broad.

Genus 541. CALOBATA. *Meig., Illig., Latr., Fabr., Leach.*

Antennæ very much shorter than the head, the third joint longer than the second: *body* long, filiform: *legs* long, filiform.

Sp. 1. *Cal. filiformis.* Latr., Leach.

Inhabits France and England.

Genus 542. SEPEDON. *Latr., Leach.* Bacca. *Fabr.* Mulio. *Schellenberg.*

Antennæ very much longer than the head, inserted on an elevation; the second joint very long, cylindric.

Sp. 1. *Sep. palustris.* Latr.

Inhabits marshes.

Genus 543. LOXOCERA. *Meig., Illig., Latr., Fabr., Leach.*

Antennæ very much longer than the head; last joint linear: *abdomen* narrow, linear.

Sp. 1. *Lox. Ichneumonia.* Meig.

Inhabits flowers in marshes.

Genus 544. SCATOPHAGA. *Meig., Latr., Leach.* Pyropa. *Illig.*

Antennæ shorter than the head: *head* round, sub-globose: *vertex* horizontal: *body* very much elongated.

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Sp. 1. *Scat. merdaria.* Latr., Leach.
Inhabits cow-dung.

Genus 545. ANTHOMYIA. *Meig., Illig., Latr., Leach.*
Antennæ shorter than the head: *head* hemispheric, transverse: *vertex* inclined: *body* not much lengthened.
Sp. 1. *Anth. pluvialis.* Latr.
Inhabits woods.

Stirps 4.—*Antennæ* inserted near the upper part of the head, not setigerous: *palpi* internal: *halteres* visible: *anterior legs* differing in form from the others.

Genus 546. PIPUNCULUS. *Latr., Leach.*
Antennæ two-jointed, the last joint subulated at its extremity: *anterior legs* simple.
Sp. 1. *Pip. campestris.* Latr.
Inhabits meadows.

Genus 547. SCENOPINUS. *Latr., Fabr., Leach.* Cona. *Schellenberg.*
Antennæ three-jointed: *anterior legs* simple.
Sp. 1. *Scen. niger.* Latr.
Inhabits houses near woods.

Genus 548. OCHTHERA. *Latr., Leach.* Macrochira. *Meig.*
Anterior legs raptorious: *antennæ* terminated by a bearded seta.
Sp. 1. *Och. Mantis.* Latr.
Once taken in Devon by Dr. Leach.

Stirps 5.—*Antennæ* frontal, very short: *palpi* internal: *halteres* entirely or partly concealed: *wings* divaricating.

Genus 549. PHASIA. *Latr., Leach.* Thereva. *Fabr., Walck., Meig., Panz.*
Antennæ distant, sub-parallel, last joint subquadrate, with a biarticulate seta: (*body* short: *abdomen* depressed, semicircular: *wings* large.)
Sp. 1. *Phas. variabilis.* Leach.
Musca hemiptera. *Linné.*

Stirps 6.—*Antennæ* frontal, as long as the face: *palpi* internal, or partly concealed: *wings* divaricating.

Genus 550. MUSCA *of authors.*
Antennæ with the third joint very much longer than the others: *abdomen* moderately long, subacuminate.
Sp. 1. *Mus. vomitoria* (common blue-bottle fly). *Latr.*
Inhabits every where. It is the insect that deposits its eggs on meat, which are commonly denominated fly-blows.

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Genus 551. OCYPTERYX. *Leach.* Ocyptera. *Latr.* Exorista. *Meig.* Eriothrix. *Meig.*

Antennæ with their last joint longer than the others: *abdomen* distinctly annulated, rounded.

Sp. 1. *Ocypt. lateralis.* Leach.

Inhabits woods.

Genus 552. GYMNOSOMA. *Meig., Leach.*

Antennæ with their last joint longer than the others: *abdomen* semicircular, subuniarticulate.

Sp. 1. *Gym. rotundata.* Meig.

Genus 553. ECHINOMYIA. *Dum., Latr., Leach.* Tachina. *Meig., Fabr.*

Antennæ with their second joint longer than the others: *abdomen* subglobose, and very bristly.

Sp. 1. *Ech. grossa.* Latr.

Inhabits woods.

Genus 554. TACHINA. *Leach.*

Antennæ with their second joint longer than the others: *abdomen* ovate, rather bristly.

Sp. 1. *Tach. fera.*

Inhabits the skirts and pathways in woods.

Fam. XV. Œstridæ. *Leach.*

Muscides, I. *Latreille.* Astomata. *Duméril.*

The larvæ of all the insects of this family reside in the frontal sinuses under the skin, or in the stomachs of graminivorous mammalia. Their curious œconomy has been admirably detailed in the third volume of the *Transactions of the Linnean Society of London* by Mr. Bracy Clark, who has lately republished his Dissertation under the title *An Essay on the Bots of Horses and other Animals. London*, 1815.

Genus 555. ŒSTRUS *of authors.*

Wings with the two exterior cells complete, the other hinder cells terminal: *thorax* with its surface unequal: *abdomen* with its point deflexed; of the female acuminate: *eyes* distant; of the male closer than those of the female.

* *Thorax roughish, with elevated points.*

The larvæ of the species of this division of the genus inhabit the frontal sinuses.

Sp. 1. *Œstrus Ovis.*

Inhabits the frontal sinuses of the sheep in the larva state; the perfect insect is found on walls and stones in the vicinity of sheepfolds.

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** *Thorax with square shining naked spots.*

The larvæ of this section reside beneath the skin of herbivorous mammalia.

Sp. 2. *Œstrus Bovis.* (*Pl.* 9. *fig.* 1.)

"The larvæ of this species, named by the peasants Warbles, or Wornils, are found beneath the skin on the backs and loins of oxen, causing tumours as large as pullets' eggs. The perfect insect, or gad-fly, appears about the end of summer, and is much dreaded by cattle."

Genus 556. GASTEROPHILUS. *Leach.* Œstrus *of authors.*

Wings with all the hinder cells terminal: *thorax* with its surfaces smooth: *abdomen* with its extremities inflexed; of the female, very much elongated and attenuated: *eyes* in both sexes equally distant.

"The larvæ of the *Gasterophili*, as their name imports, inhabit the stomach of herbivorous quadrupeds, and are called Bots; the perfect insect Bot-flies."

Sp. 1. *Gast. Equi.* Leach, Trans. Wern. Nat. Hist. Soc. vol. ii.
Œstrus Bovis. *Linné.* Œstrus Equi. *Clark.*
The larvæ inhabit the horse.

Order XVI. OMALOPTERA. *Leach.*

Diptera *of authors.*

Mouth with mandibles and maxillæ: *lip* simple: *wings* two or none (*Metamorphosis* coarctate).

Fam. I. Hippoboscidæ. *Leach.*

Head divided from the thorax by a suture at least: *proboscis* provided with two valves: *nails* of the tarsi double or treble.

"The larvæ are nourished within the abdomen of the mother, and, when full grown, are passed in the form of an oviform pupa, covered with the indurated skin of the larvæ." In the second volume of the *Transactions of the Wernerian Natural History Society of Edinburgh* is given a most excellent paper on the insects of this family by Dr. Leach. The following are natives of this country:

Stirps 1.—*Wings* two; the hinder cell only commenced: *thorax* anteriorly entire, acuminated.

Genus 557. HIPPOBOSCA *of authors.* Nirmomyia. *Nitzsch.*
Ocelli none.

Sp. 1. *Hipp. equina.* Linné, Leach (Forest-fly.) (*Pl.* 9. *fig.* 11.)
Inhabits the horse. In the New Forest of Hampshire they abound in a most astonishing degree. I have obtained from the flanks of one horse six handfulls, which consisted of upwards of a hundred spe-

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cimens. Mr. Bentley informs me, from observations he made in the summer of 1818, while in Hampshire, that the *Hippoboscæ* are found in a considerably greater abundance on white and light-coloured horses than those of a black and dark colour; and this observation was confirmed by the stable-keepers in the vicinity of the Forest.

STIRPS 2.—*Wings* two; the hinder cells complete: *thorax* anteriorly notched for the reception of the head.

* *Wings of nearly an equal breadth throughout.*

Genus 558. ORNITHOMYIA. *Latr., Oliv., Leach.*

Ocelli three, situated in foveolæ.

Sp. 1. *Ornith. avicularia.* Leach.

Hippobosca avicularia. *Linné.*

Inhabits the black grouse and tit-pippit.

** *Wings acuminated.*

Genus 559. CRATERINA. *Olfers.* STENEPTERYX. *Leach.*

Ocelli three, situated in foveolæ.

Sp. 1. *Cr. Hirundinis.* Olfers. *Stenepteryx Hirundinis.* Leach.

Hippobosca Hirundinis. *Linné.*

Inhabits the nests and bodies of the house-swallow.

Genus 560. OXYPTERUM. *Kirby, Leach.*

Ocelli none.

Sp. 1. *Oxypt. Kirbyanum.* Leach.

Inhabits England.

STIRPS 3.—*Wings* none: *thorax* anteriorly notched for the reception of the head.

Genus 561. MELOPHAGUS. *Latr., Leach, Olfers.* MELOPHILA. *Nitzsch.*

Ocelli none.

Sp. 1. *Mel. ovinus.* Latr., Leach.

Hippobosca ovina. *Linné.*

Inhabits the sheep.

Fam. II. NYCTERIBIDÆ. *Leach.*

Head united with the thorax: *nails* of the tarsi simple didactyle.

Genus 562. NYCTERIBIA. *Latr., Leach.* PHTHIRIDIUM. *Hermann, Olfers.*

Thorax depressed: *mouth* situated on the back at the anterior part of the thorax: *legs* six, placed at the sides; femora with two joints, the second long and compressed: *tibiæ* with two joints, the first longest and compressed, the second joint slender and arcuated: *tarsi* with

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five articulations, the first three gradually shorter, the fourth longer and wider, the fifth shorter, and receiving the didactyle claw: *abdomen* in both sexes with eight joints: FEMALE? with the first segment of the back produced, the fourth and remainder partly concealed, the last segment at its apex furnished with a setigerous style: MALE? with the last segment largest.

Its situation was referred to the *Diptera* by Latreille, who observes, in a note, that it may probably be found hereafter to constitute a peculiar Order of insects. From the apparent want of antennæ, and from the confluence of the head and thorax, Dr. Leach placed it amongst the *Arachnoïda*, in a division by itself. Its mode of propagation is unknown. Hermann considered the sexual as specific differences.

Sp. 1. *Nyct. Hermanni.*

Phthiridium biarticulatum. *Herm. Mem. Apt.* 124. *pl.* 6. *fig.* 1. *Olfers*, 80. Hippobosca Vespertilionis. *Schr. Fn. Brit.* 2587. Phthiridium Hermanni. *Leach, Encycl. Brit. Supp.* vol. i. 446. *pl.* 23.—*Zool. Misc.* iii. 55, *pl.* 144.

In the plate given in the third volume of the *Miscellany*, representations are given of the sexes very much magnified, with one leg still more highly increased by the aid of the microscope. The second joint of each tibia is longer than all the joints of the tarsus taken together.

Inhabits the greater and lesser horse-shoe bat.

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ARTICULATED ANIMALS

having articulated Legs, of doubtful Situation.

The singular animals that compose this group inhabit the sea. The females are furnished with two palpiform organs inserted at the base of the rostrum, on which parts they carry their eggs, attached in globular masses.

The legs are composed of three-jointed coxæ, one-jointed thighs, two-jointed tibiæ and tarsi, the latter part furnished with claws.

Order PODOSOMATA.

Body four-jointed, and formed as it were of the junction of the coxæ: *mouth* tubular: *eyes* four, placed on a common tubercle: *legs* eight.

The natural situation of this assemblage of animals is still doubtful, as very little is known concerning them: they were referred to the ARACHNOÏDA by Dr. Leach, in *Brewster's Edin. Encycl.* vol. vii. and also in the article *Annulosa* in the *Supp. to Encycl. Brit.* vol. i.; since which time, from a further examination of their characters, he is by no means satisfied as to their position.

Fam. I. PYCNOGONIDÆ, *Leach*,

Mandibles none.

Genus 1. PYCNOGONUM *of authors.*

Legs rather strong: *coxæ* with subequal joints: *tibiæ* with the first joint largest: *tarsi* with the first joint very small: *claws* simple, strong, acute.

Egg-bearing organs ten-jointed, the last joint very acute, unguiform, attached to the first joint of the body at the base of the rostrum.

Sp. 1. *Pyc. Balænarum.* Fabr., Latr., Leach, Edin. Encycl.—Supp. to Encycl. Brit. vol. i. pl. 23. Trans. Linn. Soc. xi. 388.

Inhabits the European ocean. It is not uncommon in Plymouth Sound, where it is taken by the trawl fishers.

Genus 2. PHOXICHILUS. *Latr., Leach.*

Legs very slender: *coxæ* with the middle joint longest, subclavate: *tibiæ* with the first joint shorter: *tarsi* with the first joint very small: *claws* double, unequal, the longer one acute.

Egg-bearing organs seven-jointed, the last joint tuberculiform, inserted at the base of the rostrum, one on each side, and attached to the first segment of the body.

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The specific characters of none of the species are yet ascertained. Phalangium hirsutum, *Montagu, Trans. Linn. Soc.* ix. *tab.* 5. *fig.* 7., belongs to this genus.

Fam. II. Nymphonidæ. *Leach.*

Mandibles two, biarticulate, didactyle.

Genus 3. NYMPHUM. *Lam., Leach.* Nymphon. *Fabr., Latr.* Pycnogonum. *Müller.*

Mandibles longer than the rostrum, with equal joints, the fingers curved, meeting along their whole length and abruptly hooked at their extremities: *palpi* six-jointed, the second joint elongate, the sixth very small: *legs* very slender: *coxæ* with the middle joint longest: *tibiæ* with the second joint rather longest: *tarsi* with the first joint somewhat shortest: *claws* simple.

Egg-bearing organs ten-jointed, inserted behind the rostrum almost under the anterior pair of legs.

Sp. 1. *Nym. gracile.* Cinereous: thighs cylindric.

Nymphum gracile. *Leach, Zool. Misc.* i. 45. *tab.* 19. *fig.* 1.—*Supp. to Encycl. Brit.* i. 433. *pl.* 23.

"Inhabits the British seas everywhere: but as it never attains the size of the *Phalangium*, misnamed by Linné *grossipes* (which is figured by Ström in his History of Sondmor, 208. *tab.* 2. *fig.* 16), it is doubtful if it be the same species: but as the Linnean name is so inapplicable, little fault can be found with the more appropriate name for which it has been exchanged."

Sp. 2. *Nymph. femoratum.* Reddish; thighs dilated and compressed.

Nymphum femoratum. *Leach, Zool. Misc.* i. 45. *tab.* 19. *fig.* 2.—*Supp. to Encycl. Brit.* i. 433.

Inhabits the shores on the southern coast of Devon.

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APPARATUS

USED BY

ENTOMOLOGISTS.

THE apparatus used for taking insects are few and simple: the following are indispensable, and will be found to answer every necessary purpose.

A NET, similar in its construction to a bat fowling-net; this is generally made of fine gauze or coarse muslin, and may be either dyed green or remain a white; the advantage of the latter colour is, that minute insects are sooner discovered than if the net is green, but a green net must be used for Mothing. The net rods should be made of ash, beech, hazel, or any tough wood; each rod should be about five feet in length, perfectly round, smooth, and gradually tapering. *Pl.* 11. *fig.* 1. one of the rods complete: *a*, the cross-piece, which should be of cane, and fit into the angulated ferrule: *b*, the rod, must be divided into three or four pieces for the convenience of being carried in the pocket; each joint at the upper part must have a ferrule riveted on as at *d*: the joints are best made with a notch or check, as at *c*, which prevents the upper part from twisting: when fitted together, care must be taken, in fitting the joints to the brass tubes, that they are made exact, or otherwise they will be subject to shake and continually coming to pieces.

The net (*fig.* 2.) must be bound entirely round with a broad welt, doubled to form a groove, into which the rods are to slip. In the centre of the upper part, beneath the *fig.* 2., must be a small piece of wash-leather to form a hinge; this must be sewed round the welt, divided and sewed in the middle to prevent the cross pieces from slipping over each other. *b*, about four inches of the gauze turned up to form a bag. *c*. strings passing through the staple *e*, *fig.* 1. to draw the net tight on each side; the handles are to be held one in each hand when the net is used.

With this net it is intended to take insects on the wing; and for that purpose it answers very effectually, as it may be instantly opened or folded together, and secure the insect between: even the smallest insects cannot escape if the net is not damaged, and the gauze is fine. It also answers well for collecting caterpillars, and many of the coleopterous insects that are seldom found on the wing; in using it for

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this purpose, the Entomologist must hold it expanded under the trees or bushes, and with a stout stick beat the branches, by which means a vast number of insects will fall into the net, and many hundreds may be taken in a single day.

A Hoop, or *Landing-net* (*pl.* 11. *fig.* 4.)—This is generally used in taking aquatic insects, but will be found very useful to sweep the grass and low herbage, for many coleopterous and other insects are taken in no other way:—the socket may be of such size that two joints of the net-rod will form a convenient handle, or a walking-stick may be used.

The Digger (*pl.* 11. *fig.* 5.)—This is a piece of iron or steel, of about six inches long, fitted into a wooden handle, and is used for collecting the pupæ of *Lepidoptera* at the roots of trees, also for stripping off the bark, under which many exceedingly rare insects are frequently found. The digger is best with an arrow-headed point, as at a.

A Phial (*fig.* 6.) or tin bottle, useful in collecting coleopterous insects. In this bottle a tube is introduced, which extends a little way down the bottle to prevent the insects from escaping: in small phials, a quill passed through the cork, with a cork stopper, answers extremely well for small insects.

A pair of brass Pliers (*fig.* 7.) for taking up small insects from roots of grass, &c.

A Setting Needle (*fig.* 8 and 9.), fixed in a pencil stick, for the purpose of extending the parts of insects; at the other end of the stick a camel's hair pencil is fixed, to remove any dirt or dust which may be on the insects; and if the pencil is drawn through the lips, to bring the end to a fine point, it may be frequently useful to display the antennæ, palpi, &c. of the minute species.

A Pair of Forceps (*fig.* 10.)—These are about eight or ten inches in length; are made of steel. The fans are either of a circular or hexangular form, and are covered with fine gauze; they are held and moved as a pair of scissors, and are extremely useful in taking bees, wasps, &c. If an insect is on a leaf, both leaf and insect may be inclosed in the forceps; or if lodged against the trunk of a tree, paling, or any flat surface, they may very conveniently be entrapped; if of the Lepidoptera order, the insect should be pressed with the thumb-nail pretty smartly on the thorax, but not so as to crush it; it may then be shaken into the hand, and a pin passed through the thorax, (this means is also used with moths, &c. when taken in the net;) or a pin may be passed through the thorax while the insect is confined between the gauze, and then carefully taken out by the pin.

Pocket Collecting Box.—The Entomologist must also furnish himself with a chip-box, of a convenient size for the pocket, lined at the top and bottom with cork, to stick those insects in that would injure themselves by being loose in a box: in this some camphor, con-

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fined in a small gauze-bag, should constantly be kept, as the scent from it not only tends to hasten the death of the insect, but stupifies and prevents their fluttering.

Pins.—Those used for the Crustacea are generally large, some being four inches in length;—the size of the pin should correspond with the size of the animal. Those used for insects are of two sizes, small lace, and a much finer made only for this purpose. The pins used for setting should be longer than those used for piercing the insects, and will be found much more convenient.

Pill Boxes.—Of these the Entomologist should possess three or four dozen:—they are generally used for the smaller species of Lepidoptera, such as the Tineæ, Tortrices, &c. In collecting the latter, no more than one specimen should be inclosed; and such boxes as contain them require some care in carrying, to prevent the insect being shaken, which would injure the wings: carrying them in the hat,with a handkerchief over them, to prevent their rolling about, is by far the safest way.

Quills will also be found useful; these must have one end carefully stopped up with cork or cement, the mouth with a cork stopper. It is also advisable to tie a piece of waxed sewing silk round each end, to prevent them from splitting:—the Entomologist may in these secure with safety the most minute insects.

Pocket Larvæ Box.—This is essential in collecting for the safe conveyance of Caterpillars, and is merely a chip-box, with a piece cut out of the top and bottom, and covered with gauze, for the free admission of air: a few leaves of the plants on which the caterpillars are found must be put in the box with them. Further instruction for the method of breeding insects is given below.

Setting Boards.—These are simply a thin deal board of a convenient size, and covered with soft cork. The cork must be perfectly even on the surface, and covered with white paper. As many insects require much time in drying, I should recommend the Entomologist to have a small box of about a foot square, with slips of wood nailed on the inside for the boards to slide on, and at the same time at a sufficient distance from each other, that the pins may not be displaced or moved in putting the boards in, or drawing them out; this should be kept in a dry place, and furnished with a door covered with fine muslin to admit the air, and exclude the dust.

Braces.—These are merely slips of card, used for confining the wings of insects whilst drying, as shown in *plate* 12.

Breeding Cages are used for rearing insects from Caterpillars, and may be made of wainscot, (deal is objectionable, as the scent from the turpentine is liable to kill the larvæ,) in the form represented in *pl.* 11. *fig.* 3, with the sides and front covered with gauze. *b* a small square box or tube, for the reception of a phial of water, in which the stalks

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of the plants may be put for the caterpillars to feed on. The most convenient size of the cages is about eight inches in breadth, four deep, and one foot in height; they should never contain but one kind of caterpillar, as some species devour others; and indeed, if left without food, will devour those of their own kind also. At the bottom of each case must be a quantity of earth, about two inches deep; with the earth should be mixed a little sand, and some of the fine mould frequently found in the bodies of old trees; this will prevent in a great measure the earth drying up into hard lumps or clods. The most certain way of breeding insects is to keep the cages in a cool and moist place, as in a cellar or out-house; for a great number of caterpillars change into the pupa state several inches beneath the surface of the earth, and if kept too dry, the earth about them will absorb the nutritive moisture from the animal, thereby not only weakening it, but hardening the shell in which it is inclosed, so that its strength will be insufficient to burst the case when it should come forth, and in which it must die, as many have done, occasioned entirely by this mismanagement of them.

Some years produce a greater quantity of caterpillars than others, and keeping each kind by themselves would require an immense number of cages, and much time in changing the food, and paying a proper attention to them. It is a common practice to have a breeding cage of larger dimensions, by which means a great number of caterpillars may be fed in one cage, in which a variety of food may be put, but must be taken away and replaced with fresh plants every second or third day, for this tends greatly to the obtaining of fine specimens of the perfect insect.

The larvæ of many insects that feed beneath the surface of the earth may be bred in the following manner: Let any box that is about three or four feet square, and two or three feet deep, be lined or covered externally with tin, and bore through the sides and bottom a number of very minute holes: put into this box a quantity of earth that is replete with such vegetables as the caterpillars subsist on, and sink it into a bed of earth, so that the surface may be exposed to the different changes of the weather: the lid should be covered with brass or iron net-work, to prevent their escape.

Cabinet.—In the present advanced state of Entomology, a collection of British insects requires a cabinet of from 50 to 100 drawers, which are generally about fourteen or fifteen inches in length and breadth, and about two inches in depth; the cork with which the bottoms are to be lined must be chosen as free from cracks and knots as possible, and filed, or cut very level, and be about the sixth of an inch in substance. The top of every drawer must be glazed, to prevent the admission of dust or air; the glass is usually fitted into a frame of the same size as the drawer, and is made to let in on a rabbet.

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The best method for a young Entomologist is to obtain a cabinet of about thirty drawers, arranged in two tiers, and covered in with folding doors. There is a great convenience in this size, as the cabinets are rendered more portable; and cabinets may be added of the same size, as the collection increases, without injuring the uniformity, may be placed on each other, and carried to any extent. It is immaterial whether the cabinet is made of mahogany or wainscot; sometimes they are made of cedar wood, but seldom of deal or any other wood that is soft; small holes or cells must be made on the inside of the fronts for camphor.

Corking of Drawers.—The readiest way is to buy the cork prepared, which may be obtained at most of the cork-cutters; but this will be found expensive for large cabinets. I have generally bought it in the rough state, and cut it into strips about three inches wide (the length is immaterial if the method advised hereafter is pursued); these strips must be fixed in a vice, and, if the substance of the cork will admit, split down the middle with a fine saw, (greasing the saw must be avoided as much as possible, as it will stain the paper used for covering it afterwards;) the out or black side is to be rasped down to a certain smoothness, as well as the middle or inside. Having reduced the slips to about three-eighths of an inch in thickness, glue each piece (the darkest or worst side) on a sheet of brown or cartridge paper; this should be laid on a deal board about three feet in length, and the width required for the drawer or box: a few fine nails or brads must be driven through each piece of cork, to keep it firm and in its place until the glue be dried: by this means sheets of cork may be formed of the size of the drawer. All the irregularities must be filed or rasped down quite even, and the whole surface rendered perfectly smooth by rubbing it over with pumice-stone: the sheet, thus formed and finished, must be glued into the drawers, to prevent its warping; some weights must be equally distributed over the cork, that it may adhere firmly to the bottom of the drawer: when quite dry, the weights must be removed, and the cork covered with paper, which should be of the finest quality, but not very stout; the paste should soak well into the paper previous to being laid over the cork, which, if smoothly laid on, and gently rubbed over with a clean cloth or soft paper, will be rendered perfectly smooth and tight when dry.

It is absolutely necessary that the cabinets should be kept in a dry situation, otherwise the insects will become mouldy on the antennæ, legs, &c. This evil will also occur if the insect is put in the cabinet before it is thoroughly dry. Should an insect at any time become mouldy, a camel's hair pencil dipped in clean spirits of wine, in which a little camphor is dissolved, will soon clean it; but the insect must be dried in a warm place before being again placed in the cabinet.

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If a sufficient quantity of camphor is not constantly kept in the drawers, the insects will soon be destroyed by mites: where these exist, they are easily discerned by the dust which is under the insects: camphor must be immediately put in the drawers, and the insects taken out, (the dust being brushed off by a fine soft camel's hair pencil) and baked by the fire; care must be had that too great a heat is not applied, as it will utterly destroy the specimen.

Store Boxes.—The neatest method for these is to make them about a foot square, the top and bottom about two inches deep, on the principle of back-gammon boards; the inside must be lined with cork, and, if with a hinge and neatly covered with paper or painted, they may be kept very conveniently on a shelf in an upright position like books, and lettered accordingly.

METHOD OF COLLECTING INSECTS.

Insects are so various in their habits that they may be found in every part of the world, at all seasons of the year, and in every situation. As some parts are more congenial to their nature than others, I shall state the best methods of searching in those places which in general are the most profitable to the Entomologist.

Woods, Hedges, and Lanes.—These situations produce by far the greatest portion of insects. In woods, the Entomologist must beat the branches of the trees into his folding net, and must select for this purpose open paths, the skirts, &c. The trunks of trees, gates, and felled timber, should be carefully examined, as many of the Lepidoptera and Coleopterous insects are found in no other situations. Many rare and very beautiful insects are found in the hedges, in lanes, as also in the nettles, &c. which grow under them: these should be well beat, especially when the white thorn is in bloom in the months of May and June. Should the reader collect only for the microscope, he need not go to the trouble or expense of a net, as an open umbrella inverted will answer his purpose. Hedges in dusty roads are seldom productive.—The principal woods near London, and the most frequented by Entomologists, are Coombe Wood and Norwood in Surrey,—Birch Wood, Darent Wood, and woods round Bexley in Kent. Coombe Wood has long been celebrated for the great variety of insects which it produces. Birch Wood is on the Maidstone road, and is of great extent: near the 14-mile stone on this road is a large chalk-pit in which many rare insects are to be obtained. Bexley, a small village, lies between Crayford and Foot's Cray. In these woods I have collected with great success: near the village is a large sand-pit which produces an immense number of Coleopterous and Hymenopterous insects. There are also some very rural lanes round the village which produce a great variety of insects: in the rivers and brooks I have taken many rare aquatics. Norwood

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is well known, and is but a short distance from the metropolis of London: but the inconsiderate game-keepers will frequently interrupt and warn the unoffending Entomologist to quit the wood immediately, not allowing that ours

"is untax'd and undisputed game."

Heaths and Commons.—Many insects are confined to these situations, not only on account of plants which grow in no other places, but by the cattle and their dung, in the latter of which many thousands of insects may be found in a single day in the months of April and May; these are principally of the Coleoptera Order.

The principal commons near London are Wandsworth and Wimbledon in Surrey; Epping Forest; Lessness Heath, Erith, and Bexley in Kent: a great many ponds are in those places, which produce many very local insects.

Sand-Pits.—The largest sand-pit I am acquainted with is at Charlton, near the seven mile-stone, on the lower road to Woolwich. In this pit I have met with the following rare insects, *Copris lunarius*, *Notoxus monoceros*, *Lixus sulcirostris*, *&c.* Minute insects are very abundant; the roots of grass, at which the latter are found, should be carefully examined: an Entomologist may find full employment for a whole day at this place. There are also several sand-pits on Hampstead Heath.

Meadows, Marshes, and Ponds.—In meadows, when the Ranunculi or butter-cups are in blossom, many *Muscæ* and *Dipterous* insects are found: the flags or rushes are the habitations of *Cassida*, *Donacia*, *&c.* The drills in marshes should be examined, as many species of insects are found on the long grass, as also the larvæ of several *Lepidoptera*. *Neuroptera* are generally confined to these situations, especially if any hedges or trees are near the spot. I have collected in the marshes of Plaistow, West-Ham, Barking, Hackney, and Battersea, with much success. Ponds afford to the lover of the microscope an infinite number of highly interesting objects, that are best obtained by means of the landing-net, which for this purpose need not be so long as represented in *pl.* 11. *fig.* 4. and should be made of strong cloth, but sufficiently open to allow the water to escape. The mud which is brought up from the bottom of the ponds should be examined, and what small insects are found may be put in a small phial filled with water, which will not only clean them but keep them alive; and in many instances, upon a close examination, the Naturalist will be surprised at these the most wonderful productions of Nature. To the Entomologist this mode of collecting will be equally advantageous, as he will obtain many species of *Dyticidæ*, *Notonectidæ*, *&c.*

Moss, Decayed Trees, Roots of Grass, &c.—Many insects will be

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found in moss and under it: the roots and wood of decayed trees afford nourishment and a habitation to a number of insects; many of the larvæ of the *Lepidoptera* penetrate the trunks of trees in all directions: most of the Cerambyces feed on wood, as well as some species of *Carabidæ*, *Elateridæ*, *&c.* In seeking for these the digger is generally used, as it is sometimes necessary to dig six or seven inches into the wood before they are found.

Banks of Ponds and Roots of Grass.—This is a never-failing source of collecting, which may be followed at all seasons of the year, and in general with great success: those banks are to be preferred which have the morning or noon-day sun: the Entomologist may sit down and collect with the greatest ease an immense number of *Staphilinidæ*. *Pselaphi* are generally taken in those situations.

Banks of Rivers, Sandy Sea Shores, &c.—These situations are productive of a great variety of *Coleoptera*, *Crustacea*, *&c.* The dead animals that are thrown on the shores should be carefully examined, as they are the food of *Silphiadæ*, *Staphilinidæ*, *&c.* May and June are the best times for collecting in these situations.

Dead Animals, Dried Bones, &c. should constantly be examined, as these are the natural habitats of several insects. Dead moles are frequently found hung on bushes by the country people; under these the Entomologist should hold his net, and shake the boughs on which they are hung, as a great number of Coleoptera generally inhabit them.

Fungi, Boleti, and Flowers, ought constantly, when met with, to be examined, as many exceeding rare insects inhabit them.

SEASONS FOR COLLECTING.

January, February, and March.—It is not every Entomologist that will collect at this early season of the year, under the impression that but few insects can be obtained: this is true in some measure: however, I have collected throughout the year and in all seasons, for many years, and my labours have been repaid with success much beyond my hopes or expectations. I have repaired to the woods when in some parts I have been up to my knees in snow, and, strange to say, have taken insects from under the bark of trees, moss, &c. in great numbers, and of species which have been considered scarce even in the summer months. At this season the Entomologist should not omit to collect a quantity of moss from the roots of trees, which may be carried home in a pocket handkerchief and examined, by shaking it over a sheet of paper, upon which the insects will fall, and are easily discovered.

At this season also, if the weather is mild, the Entomologist should

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dig at the roots of trees for the pupæ of *Lepidoptera*; for this purpose the digger is used, or a small trowel: the principal places worthy attention are the roots of oaks, elms, lime-trees, &c. or beneath the underwood: open the earth close to the tree, and search to the depth of several inches.

Such pupæ as penetrate into the wood require more care, lest they be destroyed when the attempt is made to extricate them; sound on the bark with the digger, and the hollows will soon be discovered where no external sign is visible; tear off the bark, (and carefully examine it, for minute Coleoptera are frequently found adhering to it,) and with a knife cut away the wood that surrounds the orifice of the cavity, to enlarge it, and take out the pupæ as carefully as possible.

April and May.—The same genial warmth that brings forth vegetation brings forth also myriads of insects into life and motion; the dung of animals at this season swarms with minute Coleoptera; several species of the Lepidoptera will also be found by looking carefully garden pales, gates in lanes, &c. Many species of Bees will be found sucking the pollen from the sallow, which blossoms at this season. Sand and gravel pits should be carefully examined, and under the stones and clods of earth many insects will be found. In May, as soon as the white-thorn is in leaf, the hedges should be well beat; the season for taking Caterpillars commences, from which most of the *Lepidoptera* are obtained, and this is by far the best method, as the insects are generally perfect, and the specimens very fine. Great attention should be paid to the larvæ, as supplying them with fresh food, and keeping the earth moist at the bottoms of their cages.

June, July, August.—In these months the Entomologist will find full employment in the woods. Most of the Butterflies are taken in these months, flying abroad in the day-time only: Moths will be found flying at break of day, and at twilight in the evening. This method is termed Mothing, and should be well followed up during the summer season. Many of the rarer *Lepidoptera* are never found but at these times. The males of some, if not of every species of the Moth tribe, and perhaps of other insects also, by a very astonishing faculty, are able to discover the females at a great distance, and in the most secret situations. The following observations by Mr. Haworth on *Bombyx Quercus* will fully establish this fact, and at the same time illustrate the manner of taking them: "It is a frequent practice with the London Aurelians, when they breed a female of this and some other day-flying species, to take her whilst yet a virgin into the vicinity of woods, where, if the weather is favourable, she never fails to attract a numerous train of the males, whose only business appears to be an incessant, rapid, and undulating flight in search of their *unimpregnated* females. One of which is no sooner perceived, than they become so much enamoured of their fair and chaste relation, as abso-

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lutely to lose all kind of fear for their own personal safety, which, at other times, is effectually secured by the reiterated evolutions of their strong and rapid wings. So fearless indeed have I beheld them on these occasions, as to climb up and down the sides of the cage which contained the dear object of their eager pursuit, in exactly the same hurrying manner as honey bees, which have lost themselves, climb up and down the glasses of a window." At the latter end of August, and the whole of September, the second and last brood of Caterpillars are found: several species of Gryllus may also be taken in meadows and marshy lands.

October, November, December.—At the fall of the leaf insects become less numerous, but many of the Hemipterous insects may be found by beating the ferns and underwood in woods, also many very beautiful Tineæ and Tortrices; the aquatic insects will be found in ponds pretty plentiful. Roots of grass, decayed trees, &c. may again be resorted to.

Having now given an outline of the rules which appear necessary for the purpose of collecting insects, I shall proceed to their preservation, which, above all, will act as a particular incitement to the early collector, who, it is supposed, "would feel very little pleasure at the recollection that all the fruits of his toil in one season would be destroyed in the next; or at best, that his specimens would only retain a wretched vestige of their original perfection."

SETTING AND PRESERVING.

Crustacea.

Method of collecting.—Most of the *Crustacea* inhabit the sea; the few that are found in fresh water are generally minute, but highly interesting: ponds, ditches, and marshes produce the latter in abundance, and are common near London; they are taken with the water-net, and may be preserved as directed hereafter.

In searching for Crustacea on the sea-shore, the Entomologist must not omit to search diligently, by turning up stones, &c.;—Confervæ and Corallines, thrown on the shore after storms, frequently contain many rare species, as also the pools left by the retiring tide on most of the rocky coasts. By walking on the sea-shore after heavy gales of wind many Crustacea will be found: he must also take every opportunity of examining the fishermen's nets, and the refuse thrown away by them. Empty shells should also be examined, as they frequently form a habitation for these animals.

Directions for preserving Crustacea for Cabinets.—Those species which inhabit the sea should be suffered to remain for some hours in cold

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fresh water, to extract the salt, which would soon destroy them by attracting moisture; they are then to be placed in a crawling posture, and the parts of the mouth are to be displayed by means of pins until dry; they will then remain in that position. The more minute species must be dried, and afterwards stuck on paper with gum-water, in different positions. Those of *Myriapoda* are to be killed by immersion in spirits, and afterwards stuck with a pin on the right side.

Crustacea and Myriapoda are kept in cabinets lined with cork, to which they are affixed with pins; or in boxes loose: the former method is best, as they can then be moved from one place to another without trouble or risk.

Arachnoïda and Acari.

The habitations of the animals of this class are fully described in the account of the genera,—further observations on this point will therefore be unnecessary.

Method of preserving.—Mr. Donovan has observed, "To determine whether some species of Spiders could be preserved with their natural colours, I put several into spirits of wine; those with gibbous bodies soon after discharged a very considerable quantiy of viscid matter, and therewith all their most beautiful colours; the smallest retained their form, and only appeared rather paler in the colours than when they were living.

"During the course of last summer, among other Spiders, I met with a rare species; it was of a bright yellow colour, elegantly marked with black, red, green, and purple By some accident it was unfortunately crushed to pieces in the chip-box wherein it was confined, and was therefore thrown aside as useless; a month or more after that time, having occasion to open the box, I observed that such parts of the skin as had dried against the inside of the box retained the original brightness of colour in a considerable degree. To further the experiment, I made a similar attempt, with some caution, on the body of another spider (*Aranea Diadema*), and though the colours were not perfectly preserved, they appeared distinct.

"From other observations I find, that if you kill the spider, and immediately after extract the entrails, then inflate them by means of a blow-pipe, you may preserve them tolerably well: you must cleanse them on the inside no more than is sufficient to prevent mouldiness, lest you injure the colours, which certainly in many kinds depend on some substance that lies beneath the skin."

The best preserved specimens that I have seen are those where the contents of the abdomen have been taken out and filled with fine sand. I have preserved several in this way, and find it answer the purpose.

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INSECTS.

Entomologists are generally satisfied if they can obtain the insect in its last or perfect state; but as a few instructions for the preservation of the egg, larva, and pupa may induce the collector to enrich his cabinet with such specimens, and which is absolutely necessary in gaining a perfect knowledge of their nature, I shall give a few particulars for this purpose.

The Egg.—The eggs of most insects retain their form and colour well if preserved in the cabinet; but those which do not promise fairly may be prepared after the method practised by Swammerdam. He used to pierce the eggs with a very fine needle, and press all the contained juices through the aperture: he then inflated them until they regained their proper form by means of a small glass tube; and lastly, filled them with oil of spike in which some resin had been dissolved.

The Larva or Caterpillar.—The preservation of insects in this state, is not only one of the most curious, but useful discoveries that have been made in this department of science.

The readiest and quickest way of destroying the life of the caterpillar is to immerse it in spirits of wine, by which means the softness and transparency of the parts are retained, and are preserved for a length of time in this liquid.

In the cabinet of Mr. William Weatherhead are preserved many larvæ of the *Lepidoptera*, which he prepares in the following way, and which answers extremely well—Having killed the animal in spirits of wine, he makes a small incision or puncture in the tail, and very gently pressing out all the contained humours, fills the skin with very fine dry sand; the insect is thus again brought to its natural shape: in the course of a few hours the skin dries, and the sand is gently shaken out: it is then gummed on a piece of card, and the preparation is ready for the cabinet: they may likewise be injected with coloured wax. There is another method which is frequently practised, and is as follows: After the whole of the entrails are pressed out, a glass tube drawn to a small point is inserted into the opening, through which the operator continues to blow while he turns the skin at the end slowly round a charcoal fire; this hardens the skin equally, and dries up all the moisture within; a pin is then put through it to fix it in a standing position: it may afterwards be anointed with oil of spike in which some resin has been dissolved, unless it is a hairy caterpillar.

The Pupa.—When insects have quitted the pupa state, the case will require only to be put into the drawers; but those which have insects within must be either dropped into scalding water, or inclosed in a small tin box and exposed to the heat of a fire, which will shortly kill the insect within.

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COLEOPTERA, ORTHOPTERA, AND HEMIPTERA.—The preservation of these Orders is attended with very little difficulty.

They are easily killed by immersion in scalding water, and upon being withdrawn should be thrown on a sheet of blossom or blotting paper to extract as much as possible the water: or they may be killed by exposing them in a tin box with a little camphor in it to the heat of a fire, which treatment will add greatly to their preservation. Those of the *Meloe* and *Gryllus* Genera, which have full and tender bodies, are subject to shrivel after death: to preserve them, make an incision on the under part of the abdomen, take out the entrails with a blunt pen or probe, and fill the cavity with cotton.

Specimens of Coleoptera that are required to be set with the wings displayed, should have the elytra separated and the pin passed through the body near the thorax, as at *pl.* 12. *fig.* 2; the wings are to be disposed as in the act of flying, and kept in this situation until perfectly dry with the card braces *b* and *c*; insects of these Orders should never have the pin passed through the thorax, but through the right elytron on the right side, as shown at *pl.* 12. *fig.* 1: the legs, antennæ, and palpi should be placed out in a natural position on the setting boards, and kept so by pins and braces, for a longer or shorter time, according to the size of the insect and state of the weather. No insect must be placed in the cabinet until it is perfectly dry. Minute insects should be fixed on slips of card, as at *pl.* 12. *fig.* 5 *and* 6, with gum, previous to which the legs, &c. should be extended, for future examination: triangular slips of card are to be preferred, as no greater portion of the insect should be hid than what is absolutely necessary to fix it to the card, as at *fig.* 5.

LEPIDOPTERA.—*Butterflies* are soon killed if a pin is passed through the thorax; but many of the *Sphinges* and large Moths are difficult to kill, being very tenacious of life. Mr. Haworth in his *Lepidoptera Britannica*, in his observations on BOMBYX *Cossus*, remarks, that "the usual way of compressing the *thorax* is not sufficient: they will live several days after the most severe pressure has been given there, to the great uneasiness of any humane Entomologist. The methods of suffocation by tobacco or sulphur are equally inefficacious, unless continued for a greater number of hours than is proper for the preservation of the specimens. Another method now in practice is better; and, however fraught with cruelty it may appear to the inexperienced collector, is the greatest piece of *comparative mercy* that can in this case be administered. When the larger Moths must be killed, destroy them at once by the *insertion of a strong red hot needle into their thickest parts, beginning at the front of the thorax.* If this is properly *done*, instead of *lingering through several days they are dead in a moment.* It appears to me, however, that insects being animals of *cold and sluggish juices*, are not so susceptible of the sensations we call pain as those which enjoy a

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warmer temperature of body and a swifter circulation of the fluids. To the philosophic mind it is self-evident, that they have not such acute organs of feeling pain as other animals of a *similar size* whose juices are endowed with a quicker motion, and possess a constant, regular, and genial warmth—such as young mice or the naked young of birds: if any of these have the misfortune to lose their heads or limbs from force, speedy death is the certain consequence: but insects under similar circumstances, it is well known, are capable of surviving a considerable time." For small Moths, it is only necessary to put the pin through the thorax, and they die in a very short time. The minute species of this Order should be collected in chip boxes, as they are in general too small to be pierced when first taken; they soon die, and the wings become stiff before the Entomologist has time to set them; but if brought home in separate pill-boxes they will remain alive for several days, and are instantly killed by being exposed near the fire, or placed under a tumbler with the lid of the box slightly elevated, but not sufficient to allow the insect to escape; a lighted match should then be placed under the tumbler, which will deprive the insect of life in a few seconds of time. The pin, which serves to transfix the insect, should be passed through the thorax in the centre, and in an upright position, so that in looking on the insect no part of the wings should be obscured by the slope of the pin. The insects of this Order are by far the most difficult to set, for they require great care and much practice to display them with that nicety which adds so much beauty to their appearance and uniformity in a collection.

The method of setting the Insects of this Order is by braces: a single brace should be first introduced under the wing near the thorax, as in *pl.* 12. *fig.* 3. *a*, with a longer brace over the wings, as at *b*; this should not touch the wing, but be ready to be pressed gently down: when the wings are raised to their proper place by the setting needle *c*, other braces are to be applied according as they are required: the antennæ and feet are to be extended to their proper attitude, and kept so by pins or small braces.

Some Moths are very liable to change colour when placed in the cabinet after a short time: an oily matter is common to all insects, but some are charged with a superabundance. It appears at first in spots on the body, but gradually pervades every part; in some it will even descend into the wings, and then an obliteration of all the beautiful markings is the least that may be expected: the method which is the most successful for recovering the original appearance after the insect has become greasy, is to powder some fine dry chalk on a piece of heated iron, cover the chalk with a very fine piece of linen cloth, and thereto apply the under part of the body of the insect: the heat of the iron dissolves the grease while the chalk absorbs it, and the cloth prevents the chalk from clotting to the insect.

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Those known species that are subject to grease, should have the contents of the abdomen taken out, and the cavity filled with cotton.

TRICHOPTERA, NEUROPTERA, HYMENOPTERA, and DIPTERA.—Most of the *Libellulæ* require the contents of the abdomen to be taken out when the insect is dead, as the body generally turns black within, a few days after death, without this precaution: the cavity may be filled up with a roll of white paper or cotton: I have found this method to answer extremely well, and the colours are as brilliant as when the insect was alive. The larger species are very powerful, and when collected they must be transfixed through the side and placed in the corked pocket-box; a brace or two should be placed across the wings, to prevent their fluttering and breaking their wings or those of other insects which may be near them. They may be killed by being plunged in boiling water, or by a hot needle, as directed for Moths. The other species of this Order not being so large soon die, as well as those of the Orders *Trichoptera*, *Hymenoptera*, and *Diptera*. They may be set by braces and pins, as in *pl.* 12. *fig.* 4. In some species of the *Diptera* the colours of the body are very lively, but change after death; in these the colours may be preserved if the contents of the abdomen be removed, and the cavity filled with a powder the colour of the living insect.

METHOD OF RELAXING INSECTS.

It frequently occurs that insects become dead and stiff before the Entomologist has an opportunity of setting or displaying their parts. *Coleoptera* are easily relaxed by immersion in hot water; and in many instances this way is to be preferred, as the parts become more pliable and are more easily set.—The *Orthoptera*, *Hemiptera*, and *Lepidoptera*, must be fixed on a piece of cork, and placed in a pan of water covered over; these, if the specimens are large, will frequently require two or three whole days before the wings will admit of replacing without the risk of breaking; care must be taken not to force the wings, or any part in fact, until the parts are perfectly relaxed, when they may be displayed and kept so by braces, as directed for recent specimens. *Neuroptera*, *Hymenoptera*, and *Diptera*, may be relaxed according to the latter method: but those insects that require the contents of the abdomen to be removed, can never be altered, and therefore must be preserved in a recent state, or their beauty is lost for ever.

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ARRANGING INSECTS IN A CABINET.

The modern practice, which is by far the best, is to arrange insects in columns, with the generic name fastened by a pin above, and the specific below them: the lines should be ruled with a black lead pencil, which will always admit of alteration, and look much neater than if ruled with ink. Males and females should be procured as far as possible. *Coleoptera*, *Orthoptera*, and *Hemiptera*, are arranged side by side, with an open-winged specimen below them. *Lepidoptera*, of Butterflies; four specimens of each species are preferred, to show the upper and under side of each sex: the Sphinges and Moths—the upper sides only are shown, as the specific characters are but seldom taken from the under side: in this and the following Orders the males are placed above, the females below; as they not only look much more natural, but save considerable room. Varieties should be procured and extended as far as possible, as they frequently tend to decide the species: mutilated specimens should be rejected; but as we cannot always readily replace them by perfect ones, it is much better to retain them. There is a vile practice in use among collectors, to mend such specimens by parts from other insects. I cannot sufficiently express my abhorrence of such ways, but should hope that no Naturalist, who is a lover of truth and an admirer of nature, will ever disgrace his cabinet by such paltry specimens, as they can be of no use in a scientific view, and only serve to lead to errors.

No Exotic *specimen* should ever be placed in a collection of British Insects, however near it may approach in appearance; for by this means numbers of insects have been described as natives of Britain, merely on account of being found in such cabinets. Species are distinguished in many instances by such minute characters, and they approach each other by such imperceptible degrees, that we cannot be too particular in our examination, or too curious in knowing their habitats, as this frequently leads us to determine whether they are natives of this country.

Our best Entomologists, therefore, where they cannot obtain British specimens of rare insects, are naturally anxious to obtain foreign ones; but these as well as doubtful species are always kept in a drawer by themselves, which answers every good purpose of reference for the sake of becoming acquainted with the species: to this drawer a large label is affixed, as, Exotic Specimens of Rare British Insects. By this means a cabinet is rendered more valuable, as a dependence can be placed on the specimens it contains, and will ever remain a credit to its possessor, as it at once distinguishes the man of science and the lover of truth.

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Every Entomologist should keep an exact journal of the insects he collects; with an account, as far as possible, of the place, food, times of appearance, &c. and place to each insect a number corresponding with that of his journal; he should also make a catalogue in which the names, generic and specific, are to be expressed, as also the synonyms, with reference to such authors as have described them. In his journal he must also insert observations on their manners, œconomy, &c. to illustrate as far as possible their natural history, for there is little doubt that many valuable discoveries are yet to be made by a proper attention to insects.

DIRECTIONS FOR THE MICROSCOPE.

Microscope—an optical instrument, by means of which very minute objects are represented exceedingly large, and viewed very distinctly, according to the laws of refraction or reflection.

Microscopes are properly distinguished into simple or *single*, and compound or *double*.

Microscopes, *single*, are those which consist of a single lens or a single spherule.

Microscopes, *compound*, consist of two or more lenses duly combined. As optics have been improved, other varieties have been contrived in the sorts of microscopes; hence we have *reflecting* microscopes, *water* microscopes, &c. Each of these two kinds has its peculiar advantage; for a single glass shows the object nearer at hand and rather more distinct; and a combination of glasses presents a larger field, or, in other words, exhibits more of an object equally magnified at one view. As each of these has its advantages, each of them has its advocates, at least in practice. The celebrated Leeuwenhoek never used any but single microscopes; and, on the contrary, Dr. Hook made all his observations with double ones.

History.—When, and by whom, microscopes were first invented is not certainly known. Huygens tells us that one Drebell, a Dutchman, had the first microscope in the year 1621, and that he was reputed the first inventor of it; though F. Fontana, a Neapolitan, in 1646, claims the invention to himself, but dates it from the year 1618. As a telescope inverted is a microscope, the discovery might easily enough have arisen from thence.

Nothing more is certain concerning microscopes, than that they were first used in Germany about the year 1621. According to Borellus, they were invented by Zacharias Jansen, in conjunction with his son, who presented the first microscope they had constructed to Prince Maurice, and Albert archduke of Austria. William Borell, who

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gives this account in a letter to his brother Peter, says, that when he was ambassador in England, in 1619, Cornelius Drebell showed him a microscope, which he said was the same that the archduke had given him, and had been made by Jansen himself. The limits of this work will not admit of a description of all the microscopes that have been invented, or the principle and laws by which they are regulated: for much useful and further information on the subject I must therefore refer the reader to the works of Baker, Adams, and others on the microscope, where every information on this head will be found.

It may not be amiss, to state clearly and distinctly the method of determining the magnifying powers of glasses employed in single microscopes. 1st. If the focus of a convex lens be at one inch, and the natural sight at eight inches, which is the common standard, an object may be seen through that lens at one inch distant from the eye, and will appear in its diameter eight times larger than to the naked eye. But as the object is magnified every way equally, in length as well as breadth, we must square this diameter to know really how much it appears enlarged, and we shall then find that its superficies is indeed magnified sixty-four times.

2dly. Suppose a convex lens whose focus is at one-tenth of an inch distance from its centre; in eight inches there are eighty such tenths of an inch, and therefore an object may be seen through this lens eighty times nearer than it can distinctly by the naked eye. It will consequently appear eighty times longer and eighty times broader than it does to common sight; and as eighty multiplied by eighty makes six thousand and four hundred, so many times it really appears magnified.

3dly. To go one step further: if a convex glass be so small that its focus is no more than one-twentieth of an inch distant, we shall find that eight inches, the common distance of sight, contains a hundred and sixty of these twentieth parts; and, in consequence, the length and breadth of an object, when seen through such lens, will each be magnified a hundred and sixty times, which multiplied by a hundred and sixty to give the square, will amount to twenty-five thousand six hundred: and so many times, it is plain, the superficies of the object must appear larger than it does to the naked eye at the distance of eight inches.

Therefore, in a single microscope, to learn the magnifying power of any glass, no more is necessary than to bring it to its true focus, the exact place of which will be known by an object's appearing perfectly distinct and sharp when placed there. Then, with a pair of small compasses, measure, as nearly as you can, the distance from the centre of the glass to the object you were viewing, and by afterwards applying the compasses to any ruler with a diagonal scale of the parts of an inch marked on it, you will easily find how many parts of an inch the

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said distance is. When that is known, compute how many times those parts of an inch are contained in eight inches, the common standard of sight, and that will give you the numbers of times the diameter is magnified: squaring the diameter will give you the superficies; and if it be an object whose depth or whole contents you would learn, multiplying the superficies by the diameter will show the cube or bulk.

A Table of the magnifying Powers of Convex Glasses employed in Single Microscopes, according to the Distance of their Focus; calculated by the Scale of an Inch divided into a Hundred Parts: showing how many Times the Diameter, the Superficies, or the Cube of an Object is magnified, when viewed through such Glasses, to an Eye whose natural Sight is at Eight Inches, or Eight Hundreds of a Hundredth Part of an Inch.

Focal Distance of the Lens or Microscope in 100dths of an Inch.	Number of Times that the Diameter of an Object is magnified.	Number of Times that the Surface of an Object is magnified.	Number of Times that the Cube of an Object is magnified.
$\frac{1}{2}$ or 50	16	256	4,096
$\frac{4}{10}$ or 40	20	400	8,000
$\frac{3}{10}$ or 30	26	676	17,576
$\frac{1}{5}$ or 20	40	1,600	64,000
15	53	2,806	148,877
14	57	3,249	185,193
13	61	3,721	226,981
12	66	4,356	287,496
11	72	5,184	373,248
$\frac{1}{10}$ or 10	80	6,400	512,000
9	88	7,744	681,472
8	100	10,000	1,000,000
7	114	12,996	1,481,544
6	133	17,689	2,352,637
$\frac{1}{20}$ or 5	160	25,600	4,096,000
4	200	40,000	8,000,000
3	266	70,756	18,821,096
$\frac{1}{50}$ or 2	400	160,000	64,000,000
1	800	640,000	512,000,000

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METHOD OF USING THE MICROSCOPE.

In using the microscope there are three things necessary to be considered; 1st, The preparation and adjustment of the instrument itself. 2dly, The proper quantity of light, and the best method of directing it to the object. 3dly, The method of preparing the objects, so that their texture may be properly understood.

Preparation of the instrument.—1st, With regard to the microscope itself, the first thing necessary to be examined is, whether the glasses are clean or not; if they are not so, they must be wiped with a piece of soft leather, taking care not to soil them afterwards with the fingers; and, in replacing them, care must be taken not to place them in an oblique situation. We must likewise be careful not to let the breath fall upon the glasses, nor to hold that part of the body of the instrument where the glasses are placed with a warm hand; because, thus, the moisture, expelled by the heat from the metal, will condense upon the glass, and prevent the object from being distinctly seen. The object should be brought as near the centre of the field of view as possible, for there only it will be exhibited in the greatest perfection. The eye should be moved up and down from the eye-glass of a compound microscope, till the situation is found where the largest field and most distinct view of the object are to be had; but every person ought to adjust the microscope to his own eye, and not depend upon the situation it was placed in by another. A small magnifying power should always be begun with; by which means the observer will best obtain an exact idea of the situation and connection of the whole, as well as the connection and use of the parts. A living animal ought to be as little hurt or discomposed as possible.

Great caution is to be used in forming a judgement on what is seen by the microscope, if the objects are extended or contracted by force or dryness.

Nothing can be determined about them without making the proper allowances; and different lights and positions will often show the same object as very different from itself. There is no advantage in any greater magnifier than such as is capable of showing the object in view distinctly; and the less the glass magnifies, the more pleasantly the object is always seen.

The colours of objects are very little to be depended on, as seen by the microscope; for their several component particles being by this means removed to great distances from one another, may give reflections very different from what they would if seen by the naked eye. Some consideration is likewise necessary in forming a judgement of the motions of living creatures, or even of fluids, when seen through the microscope; for as the moving body, and the space wherein it moves, are magnified, the motion will also be increased.

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2d. On the management of the light depends in a great measure the distinctness of the vision: and as, in order to have this in the greatest perfection, we must adapt the quantity of light to the nature of the object, and the focus of the magnifier, it is therefore necessary to view it in various degrees of light. In some objects it is difficult to distinguish between a prominence and a depression, a shadow or a dark marking; or between a reflection of light, and whiteness, which is particularly observable in the eyes of *Libellulæ* and other insects; all of them appearing very different in one position from what they do in another. The brightness of an object likewise depends on the quantity of the light, the distinctness of vision, and on regulating the quantity to the object; for some will be in a manner lost in a quantity of light scarcely sufficient to render another visible.

The light of a lamp or candle is generally better for viewing microscopic objects than daylight, it being easier to modify the former than the latter, and to throw it upon the objects with different degrees of density. The best lamp that can be used for this purpose is the one invented by Count Rumford, which moves on a rod, so that it may be easily raised or depressed. The light of a candle or lamp is increased, and more directly thrown upon the reflecting mirror or object, by means of a convex lens mounted on a semicircle and stand, so that its position may be easily varied. If the light thus collected from a lamp be too powerful, it may be lessened by placing a piece of thin writing-paper, or a piece of fine grayed glass, between the object and the reflecting mirror. Thus a proper degree of light may be obtained, and diffused equally all over the surface of an object, a circumstance which ought to be particularly attended to; for if the light be thrown irregularly upon it, no distinct view can be obtained.

The examination of objects so as to discover truth, requires a great deal of attention, care, and patience; with some skill and dexterity, to be acquired chiefly by practice, in the preparing, managing, and applying them to the microscope.

Whatever object offers itself as the subject of our examination, the size, contexture, and nature of it are first to be considered, in order to apply it to such glasses, and in such a manner, as may show it best. The first step should always be to view the whole together with such a magnifier as can take it in all at once; and after this the several parts of it may the more fitly be examined, whether remaining on the object, or separated from it. The smaller the parts are which are to be examined, the more powerful should be the magnifiers employed. The transparency or opacity of the object must also be considered, and the glasses employed accordingly suited to it; for a transparent object will bear a much greater magnifier than one which is opaque, since the nearness that a glass must be placed at, unavoidably darkens an

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object in its own nature opaque, and renders it very difficult to be seen, unless by the help of a silver speculum.

The nature of the object also, whether it be alive or dead, a solid or a fluid, an animal, a vegetable, or a mineral substance, must likewise be considered, and all the circumstances of it attended to, that we may apply it in the most advantageous manner. If it be a living object, care must be taken not to squeeze or injure it, that we may see it in its natural state and full perfection. If it be a fluid, and that too thick, it must be diluted with water; and if too thin, we should let some of its watery parts evaporate. Some substances are fittest for observation when dry, others when moistened; some when fresh, and others after they have been kept some time.

Transparent objects.—Most objects require also some management in order to bring them properly before the glasses. If they are flat and transparent, and such as will not be injured by pressure, the usual way is to inclose them in sliders between talc, or, what is certainly preferable, between two slips of glass. For this purpose thin and clear glass must be used. The slips should be about three inches in length and half an inch in width: a piece of paper, the size of the glass, must be placed between them, with circular or oblong holes cut a little larger than the object intended to be placed between them;—one side of the paper should be washed over with a little gum-water, fastened on one of the glasses, and suffered to dry; the objects are then to be placed on the glass where the holes are cut in the paper; the upper part of the paper is then to be slightly touched with gum-water; and the other glass may be placed on it. This plan answers well for the transparent wings of insects, &c.

Opaque objects are best preserved and viewed in the following manner: Cut card- or drawing-paper into small pieces of about a quarter of an inch in diameter, and with a fine camel's hair pencil, or the point of a pen, put a little gum-water in the centre of it; if the object is an insect, display the legs, antennæ, &c. by means of a fine needle (as in *pl.* 12. *fig.* 6.); the gum, when dry, will fix the insect in this position. The seeds of plants, minerals, &c. may be preserved in this way. Paper of different colours should be chosen for different objects, in order to render them the more conspicuous, such as a black paper for a white subject, &c.

Objects prepared in this way are extremely convenient for viewing, and by means of the pliers they may be examined in every direction; a pin may be passed through the paper or card, and the objects kept in a small box lined with cork. The boxes may be made the size and form of an octavo or quarto volume, and kept on shelves, in the manner of books; if made in the book form the backs should be lettered, and the collection may be continued to any extent.

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Living Objects.—These will be treated of hereafter under the head *Animalcula.*

No part of the creation affords such an infinite variety of subjects for the microscope as insects. "Insects," observe Messrs. Kirby and Spence, in their *Introductory Letter to Entomology*, "indeed, appear to have been Nature's favourite productions, in which, to manifest her power and skill, she has combined and concentrated almost all that is either beautiful and graceful, interesting and alluring, or curious and singular, in every other class and order of her children. To these, her valued miniatures, she has given the most delicate touch and highest finish of her pencil. Numbers she has armed with glittering mail, which reflects a lustre like that of burnished metals; in others she lights up the dazzling radiance of polished gems. Some exhibit a rude exterior, like stones in their native state; while others represent their smooth and shining face after they have been submitted to the tool of the polisher: others again, like so many pygmy Atlases bearing on their backs a microcosm, by the rugged and various elevations and depressions of their tuberculated crust, present to the eye of the beholder no unapt imitation of the unequal surface of the earth, now horrid with mis-shapen rocks, ridges, and precipices—now swelling into hills and mountains—and now sinking into valleys, glens, and caves; while not a few are covered with branching spines, which fancy may form into a forest of trees.

"What numbers vie with the charming offspring of Flora in various beauties! some in the delicacy and variety of their colours, colours not like those of flowers evanescent and fugitive, but fixed and durable, surviving their subject, and adorning it as much after death as they did when it was alive; others, again, in the veining and texture of their wings; and others in the rich cottony down that clothes them. To such perfection, indeed, has Nature in them carried her mimetic art, that you would declare, upon beholding some insects, that they had robbed the trees of their leaves to form for themselves artificial wings, so exactly do they resemble them in their form, substance, and vascular structure; some representing green leaves, and others those that are dry and withered. Nay, sometimes this mimicry is so exquisite, that you would mistake the whole insect for a portion of the branching spray of a tree. No mean beauty in some plants arises from the fluting and punctation of their stems and leaves, and a similar ornament conspicuously distinguishes numerous insects, which also imitate with multiform variety, as may particularly be seen in the caterpillars of many species of the butterfly tribe (*Papilionidæ*), the spines and prickles which are given as a *Noli me tangere* armour to several vegetable productions.

"In fishes the lucid scales of varied hue that cover and defend them

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are universally admired, and esteemed their peculiar ornament; but place a butterfly's wing under a microscope, that avenue to unseen glories in new worlds, and you will discover that nature has endowed the most numerous of the insect tribes with the same privilege, multiplying in them the forms, and diversifying the colouring of this kind of clothing beyond all parallel. The rich and velvet tints of the plumage of birds are not superior to what the curious observer may discover in a variety of *Lepidoptera*; and those many-coloured eyes which deck so gloriously the peacock's tail are imitated with success by one of our most common butterflies. Feathers are thought to be peculiar to birds; but insects often imitate them in their antennæ, wings, and even sometimes in the covering of their bodies.—We admire with reason the coats of quadrupeds, whether their skins be covered with pile, or wool, or fur; yet are not perhaps aware that a vast variety of insects are clothed with all these kinds of hair, but infinitely finer and more silky in texture, more brilliant and delicate in colour, and more variously shaded than what any other animals can pretend to.

"In variegation insects certainly exceed every other class of animated beings. Nature, in her sportive mood, when painting them, sometimes imitates the clouds of heaven; at others, the meandring course of the rivers of the earth, or the undulations of their waters: many are veined like beautiful marbles; others have the semblance of a robe of the finest net-work thrown over them: some she blazons with heraldic insignia, giving them to bear in fields sable—azure—vert—gules—argent and or, fesses—bars—bends—crosses—crescents—stars, and even animals. On many, taking her rule and compasses, she draws with precision mathematical figures: points, lines, angles, triangles, squares, and circles. On others she pourtrays, with mystic hand, what seem like hieroglyphic symbols, or inscribes them with the characters and letters of various languages, often very correctly formed; and what is more extraordinary, she has registered in others figures which correspond with several dates of the Christian era.

"Nor has nature been lavish only in the apparel and ornament of these privileged tribes; in other respects she has been equally unsparing of her favours. To some she has given fins like those of fish, or a beak resembling that of birds; to others horns, nearly the counterparts of those of various quadrupeds. The bull, the stag, the rhinoceros, and even the hitherto vainly sought for unicorn, have in this respect many representatives amongst insects. One is armed with tusks not unlike those of the elephant; another is bristled with spines, as the porcupine and hedge-hog with quills; a third is an armadillo in miniature; the disproportioned hind legs of the kangaroo give a most grotesque appearance to a fourth; and the threatening head of the snake is found in a fifth. It would, however, be endless to produce all

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the instances which occur of such imitations; and I shall only remark that, generally speaking, these arms and instruments in structure and finishing far exceed those which they resemble."

METHOD OF DISSECTING INSECTS.

Swammerdam excelled in the preparation of insects. Neither difficulty nor disappointment could make him abandon the pursuit of any object until he had obtained a satisfactory idea of it. But, unhappily, few of the methods he used in preparing his objects for the microscope are now known. Boerhaave examined with the strictest attention all the letters and manuscripts of Swammerdam which he could find; but his researches were far from being successful. The following are all the particulars which have come to the knowledge of the public.

For dissecting small insects Swammerdam had a brass table, to which were affixed two brass arms moveable at pleasure to any part of it. The upper part of these vertical arms was constructed in such a manner as to have a slow vertical motion; by which means the operator could readily alter the height as he saw convenient. One of these arms was to hold the minute objects, and the other to apply the microscope.

The lenses of Swammerdam's microscopes were of various sizes as well as foci; but all of them the best that could be procured both for the transparency of the glass and the fineness of the workmanship. His observations were always begun with the smallest magnifiers, from which he proceeded to the greatest; but in the use of them he was so exceedingly dexterous, that he made every observation subservient to that which succeeded it, and all of them to the confirmation of each other and to the completing of the description. His chief art seems to have been in constructing scissars of an exquisite fineness, and making them very sharp. Thus he was enabled to cut very minute objects to much more advantage than could be done by knives and lancets; for these, though ever so sharp and fine, are apt to disorder delicate substances by displacing some of the filaments and drawing them after them as they pass through the bodies; but the scissars cut them all equally. The knives, lancets, and styles he made use of in his dissections, were so fine that he could not see to sharpen them without the assistance of a magnifying glass; but with these he could dissect the intestines of bees with the same accuracy that the best anatomists can do those of large animals. He made use also of very small glass tubes, no thicker than a bristle, and drawn to a very fine point at one end but thicker at the other. These were for the purpose of blowing

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up, and thus rendering visible, the smallest vessels which could be discovered by the microscope, to trace their courses and communications, or sometimes to inject them with coloured liquors.

PARTS OF INSECTS FOR THE MICROSCOPE.

The head and the parts of the mouth can seldom be examined without the aid of a microscope; consequently, much still remains to be done in this department of science: the *palpi*, *mandibles*, *maxillæ*, &c. (for their use and situation, see page 21 to 29) would form a most beautiful series of objects, which may be rendered still more interesting by a knowledge of the manners, economy, &c. of the animals; these parts can always be separated and displayed, however old the specimen may be, by being plunged into boiling water, and then placed on a piece of blotting paper to extract whatever water remains about them: the parts of the mouth may then be displayed by means of the setting needle, and when the articulations are fine and in danger of breaking, a camel's hair pencil will be found extremely useful. The abdomen and legs frequently display the most lively and brilliant colours, especially the *Chrysalidæ;* the minute *Ichneumons* are no less to be admired, either for their beauty or the singularity of their manners. The wings, for transparent objects, form an endless variety; the disposition of the nerves is frequently found essential in their generic character, as in the *Tenthredinidæ:* these, no doubt, would frequently, with other parts, be useful in forming natural genera of many families, both of *Hymenoptera* and *Diptera*, as the parts are easy of examination: in fact, there is no part of an insect but what may be rendered a pleasing and interesting subject. The copious directions for collecting them that I have before given, will render any further directions on this head unnecessary.

There is no substance in nature but what will bear an examination by the microscope: consequently this instrument is a never-failing source of rational amusement; the hair of animals, the feathers of birds, the scales of fish, bones, the circulation of the blood, cuttings of wood, seeds, vegetable infusions, the leaves of plants, and the innumerable *animalcula* which are found in every decaying substance, will afford employment never to be regretted: I shall therefore close this part of the subject by a few brief directions for preparing, examining, and obtaining the above, which I trust will be found sufficient for the purpose.

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PARTS OF ANIMALS.

Pores of the Skin may be examined by cutting off a thin slice from any soft part of the body that is not hairy, such as from between the fingers, with a razor or sharp penknife—this is a transparent object.

Hair.—The hairs of different animals vary widely in their appearance, as also the hairs from the various parts of the human body, and will furnish a pleasing series of objects.

Calcined Bones.—Bones should be heated red hot in a clear fire, by which means all the animal juices will be destroyed, and little will be left but pure lime of a most delicate whiteness, and highly interesting from the beauty of the cells:—this is an opaque object. Some useful hints on this subject will be found in the 9th volume of the *Medico-Chirurgical Society Transactions*, in a paper by Mr. Howship, which is illustrated by plates with the specimens magnified.

Feathers of Birds.—These afford an almost endless variety of objects, both opake and transparent.

Scales of Lizards, Snakes, and Fish.—These should be carefully cleansed from any dirt or filth; they may always be cleaned by soaking in water and brushing with a camel's hair pencil.

Blood.—The circulation of the blood may be easiest seen in the tails or fins of small fish, which should be placed in a very thin glass tube.

Crustacea.—Many animals of this Class require the aid of the microscope; to the lovers of the microscope they are highly interesting, and well deserving their attention, from the little that is known concerning them: a few of the species are enumerated in the first subclass of the *Crustacea*, p. 78 to 82.

Arachnoïda.—Several species of this Class are very minute; they are found beneath the bark of trees, attached to the legs of insects, &c. As an example of the care we should take in preparing objects for the microscope, as well as forming an idea of them, it is worth notice to mention, that the figure of the "*Lobster insect*," (a species of *Obisium*) given in *Adams's Essays on the Microscope*, 4to. has a dentation on the outer part of the inner claw, which is in fact a fracture produced by compression; this was pointed out to me by my much respected friend T. Carpenter, Esq. of Tottenham, who has the identical specimen in his extensive collection. Many parts of the Spiders form most beautiful objects, especially the eyes. The webs of spiders in hedges, garden gates, and gates in woods, may frequently be examined with advantage, as these are nets in which many minute and rare insects may be found.

Acari.—This Class of animals have long been celebrated as objects for the microscope; yet it is to be regretted that very little is yet known of them, most collectors being satisfied by possessing a specimen of the "*cheese mite*," to exhibit one of the wonders of the little world.

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Shells.—Minute shells; these form most elegant subjects, and in general fetch a very high price; but they may be easily obtained by examining with a microscope the sand found on the sea shores; they are used as opake objects, and should be placed on a coloured paper that is the greatest contrast to the shell. An enumeration with figures of most of the minute British shells will be found in Montagu's *Testacea Britannica*, and Walker's *Testacea minuta*, 4to. 1784.

Animalcula.—These animals are so exceedingly numerous that volumes might be written on them. I shall therefore give only a few brief directions for the best methods of obtaining them in vegetable infusions, &c.

Infusions of Pepper.—Bruise as much common black pepper as will cover the bottom of an open jar, and lay it thereon about half an inch thick: pour as much soft water into the vessel as will rise about an inch above the pepper, shake the whole well together; after which they must be stirred, but be left exposed to the air for a few days, in which time a thin pellicle will be formed on the surface, in which innumerable animals are to be discovered by the microscope.

Eels in Paste—may be obtained by boiling a little flour and water into the consistence of honey, then exposing it to the air in an open vessel, and beating it frequently to prevent the surface from growing hard: in summer, after a few days, eels will be found in myriads visible to the naked eye, and may be preserved for a length of time by keeping the paste moistened with water.

Vegetable Infusions.—These as well as *animal infusions* are by far the best methods of procuring animalcula. Plants should be placed in a glass of either rain or river water, and suffered to remain until a scum is observed on the surface of the water, which acquires thickness by standing. In this scum the greatest number of animalcules are found. Sometimes it is necessary to dilute the infusions; but this ought always to be done with water, not only distilled but viewed through a microscope, lest it should also have animalcules in it, and thus prove a source of deception.

Stagnant waters contain also immense numbers of these very minute but interesting animals; they are also found adhering to duckweed, pieces of wood, &c. A quantity of these should be collected and thrown into clean water; they may then be separated and further examined.

Zoophytes and Corals.—These are only to be obtained on the sea shore, and are found at the recess of the tide. When an opportunity occurs of collecting in these places, every piece of sea weed, &c. should be examined, as many very rare marine animals are frequently found in them, especially after a storm.

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VEGETABLES.

Seeds of Plants afford many pleasing objects, as well as the leaves, &c.: they should be gummed to paper, as directed for Insects.

Moss.—This, in the winter months, should always be collected and carefully examined, as it not only furnishes many curious subjects of itself, but likewise harbours many very beautiful insects, minute shells, &c.

Farina or the Pollen of Plants affords some curious subjects, and is well deserving of a further investigation. In the sixth volume of the *Transactions of the Linnean Society* is given *an Account of a Microscopical investigation of several species of Pollen, with some Remarks and Questions on the structure and use of that part of vegetables. By Luke Howard, Esq.* from which the following is extracted.

"I began my observations," says Mr. Howard, "with the Hazel-tree (*Corylus Avellana*). On a calm dry day I shook off some of the pollen from the expanded catkins upon a clean piece of writing-paper: I also gathered some of the catkins and female buds. These I viewed separately on a clear plate of glass, usually transmitting the light through them from a speculum below, and with different magnifying powers, preferring those which, without enormously enlarging the objects, gave a clear view of the structure and position of several at once.

"1. *Corylus Avellana.*—Anthers furnished with transparent horn-like appendages. Pollen crumbles from the surface, and is sometimes so abundant as to fall in a visible cloud on the slightest motion of a branch. To the naked eye it is a fine yellow powder. A few grains laid on the glass plate and viewed with the lens, No. 4; some appear of an irregular angular shape, opake, except in one or two parts, where light passing presents the appearance of a perforation; others nearly spherical, the surface divided by depressed lines into a number of convex facets. The transparency of these is such, that they reflect the image of a small object held under them, as well as a drop of liquid. On repeating the examination, the former are found to come from the most mature anthers, and to differ from the latter only as a raisin does from a grape. A clear drop of distilled water being put on the glass, both kinds imbibe it with the avidity of a sponge, at the same time distending and spreading abroad in the water, but without any motion further than that which this expansion causes. When saturated with the water they remain at the bottom, clear as the liquid itself, and all alike distended to a bulk many times greater than their original one in a dry state. They are now seen to be multilocular capsules, having septa in various directions within them, the union of which with the external membrane appears at the angles in the dry state, and at the depressed lines in the wet.

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"These capsules may be kept in the water for several days without any further perceptible change. When that is dried up they return to the opake state, and the same operation may be several times repeated on them.

"In exhibiting this spectacle to some friends, pure water not being just at hand, a drop of brandy was substituted for it. This gave rise to a phenomenon equally curious and unexpected. The grains expand as in the water; but in the mean time they are put into rapid motion, each grain darting from side to side with the vivacity of a swarm of gnats in the air. As they approach to complete expansion the motion dies away, and one after another sinks to the bottom. By a small addition of fresh brandy some few are excited a second time, but with fainter movements. Presently the liquid begins to be obscured, and in a few minutes the grains are mostly dispersed and decomposed, and the spirit exhaling, leaves a sort of extract on the glass mixed with many undissolved particles, among which sometimes appear a few unbroken grains, much changed, and now resembling an empty bladder lying flat."

Mr. Howard, after the same experiments on various other plants, observes, "The proper spirit for this purpose seems to be a mixture of one part of pure spirit of wine with two of water. A stronger spirit or spirit of wine alone may sometimes be required, when we operate upon a pollen which has by any means become previously saturated with moisture, (or has lost, by keeping, a part of its irritability,) but it does not enter the dry grain so readily as water alone.

"It is proper here to remark, that the utmost care is requisite to prevent accidental mixtures of the subjects or menstrua in these experiments, which might greatly embarrass and mislead the observer; separate pieces of clear glass for the several kinds, and separate pointed glass tubes to convey the liquids, will therefore be requisite. It will be proper attentively to examine the pollen dry, as well as the liquids before they are used, in order to be satisfied of the absence of animalcules and other extraneous matter which might be suspected to influence the appearances.

"I do not pretend to say that the above-related experiments were absolutely free from optical deception; but I may venture to affirm, from frequent repetition of them, that when tried with due precaution, they will scarcely ever be found to fail of producing the appearance related."

MINERALS.

Crystals.—The name Crystal is given to those polyhedral bodies, produced by nature and the operations of chemistry, which possess a regular geometrical form and rectilineal interior structure.

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Observation has shown that every substance in crystallizing has a tendency to assume a peculiar figure. *Common salt* crystallizes in cubes, *Epsom salts* in six-sided prisms, *Alum* in octahedrons, *Sugar-candy* in oblique four-sided prisms with wedge-shaped summits. But the crystalline form in any crystallizable material is liable to be altered by circumstances affecting the crystallizing process; and hence the geometrical forms which the same identical substances present, often bear no such resemblance to each other as would seem to indicate their relation. There are, nevertheless, a certain number of figures peculiar to every crystallizable body, and the crystals of that substance assume one or other of these forms, and no other. *Common salt*, for example, when it has assumed its true crystalline shape, presents itself in the form of cubes; it is also met with in octahedrons, dodecahedrons, or some figure appertaining to these solids. *Sugar-candy* usually crystallizes in oblique four-sided prisms, and it likewise occurs in cubes and in six-sided prisms with wedge-shaped summits variously modified. *Alum* crystallizes in octahedrons, but it also occurs in cubes.

Method of obtaining Crystals.—The method of effecting the crystallization of such bodies as require a previous state of solution, and among which the class of Salts holds a distinguished rank, consists of heating the solution so as to dissipate gradually part of the water by evaporation. It is thus that chemists proceed for obtaining crystals of sulphate of potash, muriate of potash, &c.

The figure of crystals has very little regularity if the water be evaporated too hastily, as by boiling; but by keeping the saline solution in a gentle heat, very beautiful and very regular crystals are obtained in a longer or shorter space of time; and there is scarcely any salt which may not be made to assume a very distinct form by this process if it be skilfully conducted.—*Accum.*

Crystals of Camphor.—Camphor dissolves readily in spirits of wine. To obtain the crystals it is only necessary to place one drop on a piece of glass; the glass should be held over a candle a few seconds to accelerate the evaporation of the spirit, and then placed in the microscope, when the configuration may be seen.

Crystals of Silver.—This forms a very beautiful and interesting object. In one drop of nitrate of silver put a small piece of very fine brass wire; this must be immediately placed in the microscope, and the crystals will extend gradually till the whole quantity of fluid is evaporated.

Minerals of all kinds frequently exhibit very curious objects. Sand also should be collected and examined, as it is subject to great variety: —in fact, a very good knowledge might be gained of Mineralogy from small specimens, which may be obtained at very reasonable prices, and which occupy but little room.

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AN EXPLANATION

OF

THE TERMS USED IN ENTOMOLOGY.

ABDOMEN, that part of the body distinct from the thorax, forming the hinder part of the insect, and consisting of segments or rings. (*Pl.* 10. *fig.* 7. *e.*)

Æquale, when it is of the same breadth with the thorax.

Barbatum, with tufts of hair at the sides or extremity.

Falcatum, shaped like a sickle.

Petiolatum, attached to the thorax by means of a slender elongated tube.

Planum, the under part flat.

Sessile, sitting attached to the thorax in its whole breadth; not distant and connected by a filament.

Subpetiolatum, attached to the thorax by a short tube, nearly equalling the thorax in breadth.

ACULEUS, *the Sting*, an elongated dart, often poisonous, seated in the extremity of the abdomen.

Compositus, having two or more sharp points or darts.

Exsertus, projecting, not lying hid within the body.

Reconditus, always concealed within the abdomen, and seldom thrust out.

Retractilis, for the most part exserted, but capable of being drawn in.

Simplex, having one dart or point.

Vaginatus, inclosed in a bivalve sheath.

ALÆ, *the Wings*, the instruments of flight.

Acuminatæ, terminating in a subulated apex.

Angulatæ, the posterior margin having prominent angles.

Angulus ani, the posterior angle of the inferior wings.

Angulus posticus, that extremity of the wing which is opposite to the base and to the apex.

Apex, the part opposite to the base, terminating the anterior margin. (*Pl.* 10. *fig.* 8. *c.*)

Basis, the part by which it is connected with the thorax. (*Pl.* 10. *fig.* 8. *b.*)

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Bicaudatæ, the hinder wings having two projecting processes.
Caudatæ, in which one or more projections in the hinder wings are extended into processes.
Concolores, of the same colour both on the upper and under surfaces.
Conniventes, which when at rest have the anterior margin in part contiguous to the inner or posterior margin, whether erect or incumbent.
Convolutæ, wrapping round the body, the upper surface forming a convexity.
Costa, the margin between the base and the apex.
Crenatæ, the margin notched, but in such a way that the incisures are pointed to neither extremity.
Cruciatæ, incumbent, but the inner margins lying over each other.
Cruciatæ complicatæ, folded together crosswise.
Deflexæ, incumbent, but not horizontally, the outer edges declining towards the sides.
Dentato-erosæ, hollowed, with denticulations between the hollows.
Denticulatæ, with minute distinct teeth.
Denudatæ, a certain part destitute of scales, but opake.
Digitatæ, divided nearly to the base like fingers.
Discus, the space between the base, the apex, the margin, and the suture.
Divaricatæ, incumbent, but diverging behind.
Elongatæ, the posterior margin longer than the interior.
Erectæ, when at rest, standing up so as to approach each other.
Erosæ, with minute obtuse hollows and unequal laciniæ.
Excaudatæ, having no projecting processes.
Extensæ, not lying upon one another.
Falcatæ, the posterior margin obtusely hollowed.
Fenestratæ, with one or more transparent spots.
Fissæ, digitated, divided into linear portions with straight margins.
Gymnopteræ, membranaceous and transparent without scales.
Horizontales, which when at rest are parallel to the horizon.
Hyalinæ, quite transparent.
Incumbentes, which when the insect is at rest cover the back of the abdomen horizontally.
Incurvatæ, the anterior margin bent like an arch.
Integerrimæ, with a margin linear and not in any wise cut.
Integræ, undivided without indentations.
Irroratæ, marked with exceedingly minute points.
Lanceolatæ, oblong attenuated at both extremities.
Maculatæ, marked with spots.
Margo exterior, anticus, crassior alæ, the margin between the base and the apex.

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Margo posterior, the margin between the apex and the *angulus posticus*.

Margo interior or *tenuior*, the margin etween the base and the *angulus posticus*.

Nebulosæ, marked with many scattered, abrupt lines, of various forms.

Nervosæ, with nerves large for the size of the wing.

Nitidissimæ, with scales exceedingly smooth and resplendent.

Ocellatæ, with one or more *ocelli*, or eye-like markings.

Pagina superior, the upper surface of the wings.

Pagina inferior, the under surface.

Patentes, horizontal, extended when at rest, not uniting or incumbent.

Patulæ, nearly horizontal, little inclined, and not incumbent.

Planæ, extended horizontally, which cannot be folded up.

Plicatæ, wings which when at rest are folded up, but expanded in flight.

Punctatæ, marked with very small dots.

Radiatæ, with nerves diverging like rays from a common centre.

Repandæ, with a waving but plain margin.

Reticulatæ, with nerves disposed like net-work.

Reversæ, deflexed, the margin of the secondary wings projecting from under the primary.

Rotundatæ, the posterior margin rounded and devoid of angles.

Subcaudatæ, the process in the posterior wings, hardly longer than a serrature.

Suberosæ, somewhat indented, but irregularly.

Tessellatæ, marked with black spots so disposed as to resemble a chequered pavement.

Truncatæ, with the posterior angle straight.

Tumidæ, with elevated membranes among the veins.

Variegatæ, of different colours.

Undulatæ, marked with continuous and nearly parallel waving lines.

Unguiculatæ, with a membranaceous tooth or claw at the *costa* or exterior margin.

ANASTOMOSIS, a spot in the upper wing, at the branching of the nerves, near the anterior margin.

Striga, observing the course of the nerves.

ANTENNÆ (*or Horns*) For the supposed use of these organs see p. 21. They are subject to the greatest variety: the number of joints, their form, &c. should always be considered, as they are useful in distinguishing genera; they are discriminated as follows.

Aculeatæ, armed with small sharp points.

Aculeato-serratæ, set with thick prickles turned towards the apex.

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Aculeato-uncinatæ, set with hook-shaped prickles.
Acuminato-setaceæ, terminated with a stiff sharp-pointed hair.
Amphi-ophthalmæ, wholly or in part surrounded by the eyes.
Approximatæ, close together at their base.
Aristatæ, furnished with a compressed lateral knob, having attached to it a short beard or bristle.
Articulatæ, with distinct joints or articulations.
Barbatæ, with tufts of hair at the articulations.
Breves, shorter than the body.
Capitatæ, clavated, ending in a knob.
Catophthalmæ, when placed behind the eyes.
Ciliatæ, fringed with parallel *setæ*, inserted along the side of the *antennæ* through their whole length.
Clavatæ, club-shaped, terminating in a knob; growing gradually thicker towards the apex.
Coadunatæ, connected at the base.
Dentatæ, set with remote spreading points in one direction.
Distinctæ, not united at their base.
Elongatæ, when longer than the head.
Exarticulatæ, with no distinct articulations.
Filatæ, simple, without a lateral hair or thread.
Filiformes, of the same thickness through their whole length.
Hyperophthalmæ, placed above the eyes.
Hypophthalmæ, placed under the eyes.
Lamellatæ, pectinated, but with scales instead of bristles.
Longæ, longer than the body.
Mediocres, of the same length with the body.
Moniliformes, with distinct subglobular joints or bead-like articulations.
Mucronatæ, terminating in a sharp projecting point.
Nudæ, not garnished with hairs or bristles.
Nutantes, at the points bent downwards.
Pectinatæ, comb-shaped, or sending out from both sides parallel bristles the whole length.
Perfoliatæ, the club being horizontally divided, the pieces connected in the middle.
Perfoliato-imbricatæ, consisting of small concave pieces, imbricated and connected in the middle.
Plumosæ, like a plume of feathers.
Porrectæ, stretched straight forward.
Prismaticæ, linear, with more than two flat sides.
Pro-ophthalmæ, placed before the eyes.
Ramosæ, with many lateral branches.
Remotæ, distant from each other.
Rigidæ, not flexible.

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Securiformes, shaped somewhat like an axe.
Serratæ, toothed like a saw, the incisures turned towards the extremities.
Setaceæ, growing gradually more attenuated from the base to the point.
Seticornes, in the shape of a bristle.
Simplices, not branched.
Spinosæ, set with large subulated spines.
Spiriformes, rolled into a spiral form.
Subulatæ, linear at the base, growing more slender and pointed at the apex.
Truncatæ, the club terminated abruptly by a transverse line.
Verticillatæ, with hairs arranged in whorls at the joints.
Uncinatæ, clavated and mucronated, the point reflexed so as nearly to form a right angle.

APTERA, insects without wings; many of the *Coleoptera* are destitute of wings, and in most of such species the elytra are close, not separable: the females of several species of the *Lepidoptera* are also destitute of wings; as are also some of the *Hymenoptera*.

AREOLÆ, *Wing-cells*. In *Hymenoptera* these are essential in the generic character; as in *Tenthredinidæ*, *&c.*
Marginales, those cells situated on the upper part of the wing near the apex. (See *pl.* 10. *fig.* 10. *a. a.*)
Submarginales are beneath the above. (*Pl.* 10. *fig.* 10. *b. b. b.*)

ARTUS, the various instruments of motion, viz. the wings, the feet, &c. (See p. 33.)

ATOMUS, a very minute dot or point.

BODY. See CORPUS.

CAPUT. The *Head*.
Angulatum, the margin cornered.
Attenuatum, lengthened, blunt at the base, growing narrower at the apex.
Attenuatum posticè, blunt at the apex, narrower at the base.
Basis, the part connected to the thorax.
Canaliculatum, with one or more deep hollow lines.
Clypeatum, covered above with a leaf-like spreading substance.
Conicum, cylindrical, growing smaller at the apex.
Cornutum, some part ending in a horn.
Depressum, pressed downwards as it were, or thinner than broad.
Emarginatum, terminating in a notch.
Exsertum, distinctly separated from the thorax.
Gibbum, convex both above and below.
Inflexum, not on the same plane with the thorax, bending inward.
Integrum, undivided, without any furrow.
Lunatum, roundish, divided at the base by a hollow, the hinder angles acute.

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Marginatum, with a free elevated margin.
Muticum, not furnished with horns, spines, or tubercles.
Nutans, fixed transversely at right angles with the thorax.
Porrectum, prominent and elongated.
Prolongatum tubo, the apex running out into a tube.
Prominens, on the same plane with the thorax, but narrower.
Retractile, capable of being drawn at pleasure within the thorax, and concealed there.
Retractum, placed within the thorax, and not to be distinguished from it.
Rugosum, wrinkled, marked with waved and elevated lines either longitudinally or transversely.
Tuberculatum, rough with rigid prominent warts or tubercles.

CAUDA, *the Tail*, a part affixed to the extremity of the abdomen. (See p. 33).
Aristata, terminating in a bristle or slender thread.
Biseta, having two slender attenuated setæ.
Foliacea, spreading out like a membrane.
Rostrata, standing out like a beak.
Setosa, elongated, slender, gradually attenuated.
Triquetra, having three plane sides.
Triseta, having three slender attenuated setæ, as in *Ephemera*.

CHELA, the extreme part of the foot, with a moveable lateral toe like the claw of a crab.

CHRYSALIS, (the pupa of those *Papilionidæ* that are often of a golden colour) synonymous with PUPA.

CICATRIX, an elevated and somewhat rigid spot.

CINGULA, coloured bands or belts surrounding the abdomen.

CLYPEUS, a horny horizontal part of the head covering the mouth. (See p. 30.)

COLEOPTRA, both elytra.

COLOR.—The colour of insects varies greatly, and it frequently occurs that the species cannot be determined by this alone. Many circumstances will tend to alter the colour; as a change of food, the age, &c. and such casualties should be allowed for. In studying the species and arranging varieties, the extreme of both light and dark specimens should always be retained.
Æruginosus, light blueish green, like verdigrise.
Albus, dull white.
Albidus, dirty dull white.
Ater, the purest and deepest black.
Atro-purpureus, very dark red, almost approaching to black.
Atro-virens, dark green, bordering on dark blue.
Aureus, gold-yellow, without any foreign mixture.

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Aurantiacus, orange, or a mixture of yellow and red.
Azureus, azure blue, nearly the same with *Cæruleus*, but bright like ultramarine.
Badius, chesnut or liver-brown bordering on dark red.
Brunneus, the darkest pure brown.
Cæsius, pale blue, verging towards gray.
Cæruleus, sky-blue.
Canus, hoary, with more white than gray.
Carneus, flesh-colour, something between white and red.
Cinereus, ash-colour, blackish gray.
Coccineus, cinnabar-colour, with a slight tinge of blue.
Croceus, saffron-colour, dark orange.
Cyaneus, dark blue like Prussian blue.
Ferrugineus, brown, verging towards yellow.
Flavo-virens, green, verging upon yellow.
Fuscus, brown, running into gray.
Griseus, lively light gray.
Glaucus, green, bordering upon gray.
Hepaticus, liver-brown.
Lacteus, shining white.
Lateritius, brick-colour, like *Miniatus*, but duller, and verging towards yellow.
Lilacinus, lilac, like *Violaceus*, but duller, and verging more towards red.
Lividus, dark gray running into violet.
Luteus, yellow.
Miniatus, high red, like red-lead.
Niger, black, with a tinge of gray.
Ochraceus, yellow, with a small tinge of brown.
Pallidus, of a pale cadaverous hue.
Pallide-flavens, pale or whitish yellow.
Prasinus, grass-green without any tinge of blue.
Puniceus, fine bright red like carmine.
Roseus, rose-colour, a pale blood-red.
Sanguineus, pure red, but duller than *Puniceus*.
Sulphureus, bright yellow.
Testaceus, a dark red, or brick-colour.
Violaceus, violet-colour, a mixture of blue and red.
Vitellinus, yellow, with a slight tinge of red.

CORPUS, the *Body* (and see also ABDOMEN). This part is frequently considered in the generic characters, and designated as under.
Compressum, flattened at the sides.
Depressum, depressed, thinner than broad.
Glabrum, of a smooth shining surface.

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Hemisphericum, convex above, flat below, like the section of a globe.
Lineare, oblong, equal in breadth throughout.
Marginatum, with a free elevated margin.
Membranaceum, nearly of the consistence of a leaf.
Nitidum, the surface smooth and shining.
Nudum, not covered with either wool, hair, or bristles.
Oblongum, the transverse diameter much less than the longitudinal.
Obovatum, inversely ovate, the narrow end downwards.
Obtusum, blunt, rounded at the apex.
Orbiculatum, the transverse diameter equal to the longitudinal.
Ovale, egg-shaped, the outline at both extremities equal.
Ovatum, the longitudinal diameter exceeding the transverse, and the latter broader at the base than at the apex.
Pilosum, set with distinct long hairs.
Planum, the under part flat.
Pubescens, covered with soft hair.
Retusum, terminating in an obtuse hollow.
Rotundatum, the outline nearly circular, without corners.
Rugosum, wrinkled, marked with waved and elevated lines, either longitudinally or transversely.
Scabrum, rough, with hard raised points.
Sericeum, covered with soft shining hairs.
Tomentosum, covered with a soft down or wool.

CRUSTACEUS, somewhat hard, elastic, resisting the impression of the finger.

DECLARATUM INSECTUM, the insect arrived at its perfect state.

DISCUS, of the wing, elytra, &c. the middle between the base, the apex, the margin, and the suture (*Pl.* 10. *fig.* 5. *a.*)

ELYTRA, two crustaceous or coriaceous wings, expanded in flight, when at rest covering the abdomen, and inclosing the membranaceous wings. (See p. 37.) The elytra are subject to great variety in Colour, Markings, Sculpture, &c. and are distinguished by many terms in common with *Abdomen*, *Alæ*, *Thorax*, &c. They are called
Abbreviata, when shorter than the abdomen.
Aculeata, armed with small sharp points.
Angustata, narrower than the back.
Apex, the part at the extremity of the abdomen. (*Pl.* 10. *fig.* 5. *d.*)
Attenuata, attenuated, blunt at the base, growing narrower at the apex.
Basis, the part next the thorax. (*Pl.* 10. *fig.* 5. *c.*)
Canaliculata, with deep hollow lines.
Carinata, forming a ridge at the suture.
Coadunata, undivided, joined together at the suture.
Convexa, the surface elevated like the section of a sphere.

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Coriacea, of a substance like leather.
Deflexa, the edges declining towards the sides.
Dentata, the margin or apex set with sharp pointed processes.
Denticulata, with minute distinct teeth.
Dimidiata, covering but half of the back.
Emarginata, terminating in a notch.
Fastigiata, transverse, at the apex emarginate.
Fenestrata, with one or more transparent spots.
Flexilla, capable of being bent, not crustaceous.
Hirta, thickly covered with short hairs.
Hispida, set with short rigid bristles.
Inmarginata, without a margin or distinct rim.
Immobilia, that cannot be moved, and consequently are useless for flight.
Inæqualia, the surface not flat, but with irregular elevations and depressions.
Integra, completely covering the back.
Linearia, oblong, equal in breadth throughout.
Lineata, marked with depressed lines.
Lineato-punctata, dotted, the dots or punctures disposed in lines.
Marginata, with a free elevated margin.
Margo, the outer rim next the belly, from the base to the apex.
Muricata, rough, with rigid spines.
Mutilata, which do not completely cover the back, whether with respect to length or breadth.
Pilosa, set with distinct hairs.
Porcata, with elevated longitudinal lines or ridges.
Præmorsa, the apex terminating obtusely, with unequal incisures.
Pubescentia, covered with soft hair.
Punctata, marked with very small excavated dots or punctures.
Rigida, not flexible.
Rotundata, the apex without angles.
Rugosa, wrinkled, marked with waved and elevated lines, either longitudinally or transversely.
Scabra, rough with hard raised points.
Sericea, covered with soft shining hairs.
Sinuata, a hollow, a deep furrow as if scooped out.
Spinosa, the margins set with subulated rigid spines.
Striata, slightly channelled with parallel lines.
Submarginata, the margin having a distinct rim, but neither free nor elevated.
Subrotunda, the outline nearly circular.
Subulata, linear at the base, growing more slender, and pointed at the apex.
Sulcata, with one or more deep hollow furrows.

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Sutura, the part where the elytra meet and form a line in the middle of the back from the base to the apex.
Tomentosa, covered with soft down or wool.
Truncata, abbreviated, the apex terminating in an abrupt line.
Tuberculata, rough, with rigid prominent warts or tubercles.
Villosa, covered with soft hair.

ERUCA, the old word for *Larva*.

ESCUTELLATUS, having no scutellum.

FASCIA, a broad transverse line or band.
Abbreviata, not extending throughout the wing.
Communis, extended over both upper and under wings.
Dimidiata, running only half the length of the wing.
Hyalina, quite transparent.
Interrupta, broken, but continued either above or below.
Sesquitertia, occupying the fourth part of the wing.
Terminalis, near the apex and posterior margin.
Undata, with waving obtuse sinuses.

FASCICULUS, a bundle or tuft of hair as on the back of many caterpillars.

FEMUR, the thigh, that part of the limb nearest the body. (*Pl.* 10. *fig.* 6. *b.*—*fig.* 7. *c.*)
Arcuatum, bent, like a circular arch.
Basis, the part next the body.
Dentatum, the margin having one or more indentations.
Hispidum, set with short rigid bristles.
Incrassatum, growing thicker in the middle.
Muticum, without spine or tooth.
Saltatorium, thick, formed for leaping.
Spinosum, set with large subulated spines.

(FEMORA) *simplicia*, equal, and without any remarkable difference in thickness.

FENESTRA, a clear transparent spot.

HABITAT, the habitation, the places where insects are usually found.
Abietis, fir-groves.
Absinthetis, places where wormwood abounds.
Agris, artificial grass-fields, clover, &c.
Alnetis, places abounding in alder.
Animalibus putridis, dead animals in woods, sides of rivers, &c.
Aquis, water.
Aquis fluentibus, running streams.
Aquis stagnantibus, ponds and standing waters.
Arundinetis, reedy fens.
Betuletis, birch-trees, or woods.
Boleto, boletaria and fungi.
Carduetis, places overgrown with thistles.
Chelidoniis, where celandine grows.

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Compascuis, grassy commons.
Corylis, nut-trees.
Cretaceis, chalky places.
Domibus, houses or out-houses in the shade
Dumetis, bushy places or thickets.
Ericetis, heaths or heathy commons.
Floribus, the blossoms of flowers.
Fossis, ditches full of aquatic plants.
Fungis, funguses in all their states.
Graminosis, grassy banks, &c.
Hortis, gardens, the resort of many rare and interesting insects, which if extensive, will afford full employ at all hours of the day and seasons of the year.
Lapidibus, stones. *Sub lapides*, under stones.
Lappaceis, places where burdock abounds.
Lichenosis, trees and pales abounding in lichens.
Ligno putrido, decayed trees and wood.
Lucis, thick woods.
Nemoribus, shady groves.
Paludibus, marshy grounds.
Parietinis, shady sides of old walls.
Pascuis, pastures.
Peridumetis, skirts of woods.
Pinetis, where pines are plentiful.
Populetis, among poplars.
Pratis, meadows.
Quercetis, among oaks.
Ripis, banks of gross weeds.
Sabulosis, sandy places.
Salicetis, amongst willows.
Segetibus, grassy borders, &c. of corn fields.
Sepibus, hedges.
Sepimentis, lanes between hedges, mostly moist.
Septis, old shady pales and rails.
Siccifoliis, withered leaves on oaks, &c.
Spartiosis, broom fields.
Stagnis, ponds wherein water-plants grow.
Stercore, the dung of animals, especially of horses and cattle.
Sylvis, woods, open only in their paths.
Sylvaticis, considerable open parts in woods.
Tiliaceis, among limes.
Truncis, shady trunks of trees.
Viminosis, ozier-holts.
Ulicetis, commons abounding in furze.
Uliginosis, bogs, fens, and moist places.

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Ulmosis, amongst elms.

Umbelliferis, on umbelliferous plants in hedges and wood sides.

HALTERES (see p. 37), poisers, in the Order of *Diptera*; two globular bodies placed on slender stalks behind the wings, and seated on the thorax; sometimes they are an arched membranaceous scale.

HAMULI. These are very minute hooks or crotchets, discoverable under, a good magnifier, on the inferior wings of many Hymenopterous insects, by means of which they are kept steady in flying. —*Kirby*.

HASTATA, a javelin-shaped mark that is triangular; the base and sides hollowed, the posterior angles spreading horizontally.

HAUSTELLUM, a sort of trunk at the mouth of insects, principally of the *Diptera*, consisting of setæ, which are either inclosed in a bivalve sheath or without one.

HEAD. See CAPUT.

HEMELYTRA, wings either wholly or in part formed of a substance intermediate between leather and membrane.

HEXAPODA *insecta*, having six feet, as in all genuine insects.

HYALINA, wings, elytra, &c. quite transparent.

IMAGO, the perfect insect after having gone through the states of *Larva* and *Pupa*.

IMBRICATUS, set with scales, lying over each other like the tiles of a house.

INSTITA, a stria of equal breadth throughout.

LABRUM. (See p. 28.)

LARVA, caterpillar, grub or maggot; the insect as it comes from the egg, slow, sterile, and voracious.

Caudata, with a tail or horn, as in most of the *Sphingidæ*.

Gregaria, those larvæ that live in society, many of them inclosed in a web.

Nuda, naked, not hairy.

Polyphaga, that will eat a variety of plants.

Subcutanea, small caterpillars that feed within the substance of the leaf.

LINEA, a line, the twelfth part of an inch.

LINGUA, the *Tongue*. (See p. 29.)

Replicatilis, the point capable of being turned back.

Spiralis, capable of being rolled up like the spring of a watch between the palpi. (*Pl.* 10. *fig.* 9.)

LITURA, a spot of a deeper colour in one part than another.

LUNULA, a spot shaped like a new moon.

MACULA, a spot, larger than punctum, of an indeterminate figure, and of a different colour from the ground. (*Pl.* 10. *fig.* 8. *h*.)

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Annularis, round, the middle of the same colour with the rest of the wing.

Deltoidea, nearly triangular.

Flexuosa, irregularly waving.

MANDIBULÆ, the mandibles. (See p. 28. *Pl.* 10. *fig.* 1. *d.*)

MANUS, a foot shaped like the claw of a crab.

MARGINATUS, thorax, elytra, &c. with a free elevated margin.

MAXILLÆ, organs at the mouth, generally semicircular, pointed at the ends, moving transversely, that is, horizontally, not perpendicularly as in the human species, for the purpose of holding and comminuting the food. (See also p. 28. *Pl.* 10. *fig.* 2. *a.*—*b. c. maxillary palpi.*)

Dentatæ, the margins set with sharp pointed processes.

Forcipatæ, like a pair of pincers.

Furcatæ, forked, divided into two parts at the ends.

Lunulatæ, thick in the middle, and smaller towards the base and the apex.

Prominentes, placed straight before the head, and on the same plane.

MENTUM, *the chin*. This part is most observable in the *Lucanus Cervus*.

METAMORPHOSIS.—The transformation of an insect from the *larva* to the *pupa*, and previous to its last or perfect state. The metamorphosis of insects is defined as follows.

Coarctata, of an oblong cylindrical shape with no part of the body visible; as in the Order *Omaloptera*.

Incompleta, with motionless feet and wings; as in *Coleoptera*, *Lepidoptera*, *&c.*

Semicompleta, when the *pupa* moves, eats, and has wing-cases; as in *Dermaptera*, *Orthoptera*, *Dictyoptera*, *Hemiptera*, *&c.*

OCELLI (or *Stemmata*), little shining eyes generally placed together on the crown of the head, for the purpose of seeing objects at a distance and above the insect.

Dioptrati, with a transparent pupil divided transversely by a small line.

Sesquialter or *Sesquiocellus*, a large ocellus inclosing a smaller one.

OCULI, *the eyes* (see p. 21). All *insects* have at least two eyes: the *Arachnöida* have six or eight, arranged for the most part on the *vertex* or summit of the head. They are subject to considerable variety in situation and shape, and are distinguished as under.

Approximati, when placed close together.

Bini, two eyes, one placed on each side of the head.

Colorati, of a different colour from that of the head.

Compositi, furnished with many and often numerous lenses, for the purpose of seeing near objects and those at a distance.

Concolores, of the same colour with the head and body.

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Contigui, touching one another.
Fasciati, marked with stripes of a different colour: this may be observed in several of the Dipterous insects, particularly those of the *Tabinidæ*; but the colours fade when the insect is dead.
Fenestrati, the pupil glassy and transparent.
Hemispherici, convex, like the section of a globe.
Immobiles, so fixed in the head as to be incapable of motion.
Inferi, placed on the under side of the head.
Interrupti, broken, but continued either above or below, as in the *Gyrinidæ*.
Laterales, placed at each side of the head.
Lunati, resembling a crescent or new moon.
Mobiles, so situated as to be moveable.
Obliterati, the pupil scarcely distinguishable.
Octoni, eight distinct eyes, as in many of the *Arachnöida*.
Ovales, egg-shaped, the outline at both extremities equal.
Pedunculati, elevated on a stalk or peduncle.
Plani, the surface on the same plane with the head.
Prominuli, standing far out from the head.
Quaterni, with four eyes.
Remoti, distant from each other.
Reniformes, kidney-shaped, nearly round, hollowed on one side.
Seni, with six distinct eyes.
Simplices, furnished with only one lens.
Variegati, of different colours.
Verticales, placed on the crown of the head.

OS, the *mouth* and its parts. (See p. 27.)
Inferum, when placed on the under side of the head.
Maxillosum, with large maxillæ.
Pectorale, situated in the breast, in a tube or rostrum.
Terminale, the apex of the head.

PAGINA *superior*, the upper surface of the wing.
——— *inferior*, the under surface.

PALATUM, the interior part of the transverse lip.

PALPI, organs placed at the mouth, often articulated, and generally shorter than the antennæ, and are either two, four, or six. (*Pl.* 10. *fig.* 1. *e. g. labial palpi. f. f. maxillary palpi.*)
Clavati, club-shaped, terminating in a knob; growing gradually thicker towards the apex.
Elongati, longer than common, or longer than the mouth.
Exarticulati, with no distinct articulations.
Exserti, projecting, not lying hid.
Filiformes, of the same thickness throughout.
Incurvi, turning straight upwards at the ends, over the head.
Pediformes, with a geniculated articulation like a foot.

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Porrecti, stretched straight forwards.
Recti, straight, without flexure.
Recurvati, turned back.
Securiformes, shaped somewhat like an axe.
Setacei, growing gradually more attenuated from the base to the apex.
Simplices, not articulated.
Subulati, linear at the base, growing more slender and pointed at the apex.

PATELLÆ, orbicular, elevated, moveable bodies on which the base of the femora rests, as in the *Ichneumonidæ*.

PECTINES, in the genus *Scorpio*, two bodies situated between the abdomen and the breast, dentated on one side, but the number of teeth varies.

PECTUS, *the Breast*, the under part of the thorax to which the feet are attached.

PEDES, *the Limbs*.—This term is applied by Linné to the whole limb, including the *femur*, *tibia*, *tarsi*, and *unguis*. The formation of the legs will generally determine the habits of insects, and are called
Cursorii, when formed for running.
Mutici, without claws or spines.
Natatorii, compressed, doubly ciliated and two-edged, formed for swimming.
Saltatorii, with thick thighs, formed for leaping.
Serrati, dentated or toothed like a saw.
Spinosi, set with large subulated spines.

PETIOLATUM, having a slender elongated tube connecting the abdomen to the thorax: this is observable in many of the Hymenopterous insects.

PLANTÆ, the under part of the tarsi.
Hemisphericæ, concave and nearly circular: this kind of *tarsus* is peculiar to the aquatic *Coleoptera*. (*Pl.* 3. *fig.* 13. a.)

PROBOSCIS, a hollow tube at the mouth, often fleshy, and enlarging at the point.
Inflexa, tending towards the breast.
Plicatilis, pliable, so that it can be folded up.
Porrecta, stretched straight forward.
Recurvata, turning backwards.

PUPA, *Aurelia*, *Chrysalis*, *Nympha*, the animal changed from a *larva*, often motionless, destitute of mouth, &c. See *Metamorphosis*.
Folliculata, inclosed in a case made of hair or silk, or of leaves, wool, earth, &c. conglutinated together.
Nuda, not inclosed in a case, not folliculated.
Obtecta, wrapped up in a crustaceous covering, the thorax and abdomen obvious.

PUNCTATA, *Elytra*, &c. sprinkled with hollow dots or punctures.

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PUNCTUM, a small dot of a different colour from the rest of the wing.
Callosum, an elevated and somewhat rigid point.
Geminum, two spots near each other but separated.
Ramosum, divided into distant parts.
Ocellare, an orbicular spot of a different colour in the middle.
Sesquialterum, formed of two spots that are distinct but contiguous.
RENIFORMIS, kidney-shaped, nearly round, hollowed on one side.
RIVULUS, a stripe running irregularly over the wing, and of a different colour from it.
ROSTRUM, the mouth lengthened out into a snout or tapering beak; this part is subject to great variations, and in the *Curculionidæ, &c.* is essential in the generic character.
Acutum, the apex forming an acute angle.
Apex, the point.
Arcuatum, bent like a circular arch.
Basis, the part next the head.
Bivalve, consisting of two concave valves, united so as to form a tube.
Breve, shorter than the head.
Canaliculatum, with a deep hollow groove in the middle.
Conicum, cylindrical, growing smaller at the apex.
Cylindricum, linear and round.
Geniculatum, bent, and making an angle at the flexure.
Inflexum, not projecting, but bent towards the breast.
Longius, longer than the head and thorax.
Longum, longer than the head.
Longissimum, longer than the body.
Multivalve, forming a tube by means of many valves uniting.
Nutans, transversely fixed to the head.
Porrectum, prominent and elongated.
Rectum, produced but not bent.
Setaceum, slender, flexible, and gradually tapering towards the apex.
Tubulosum, perforated like a tube; entire.
RUGOSUS, with waved and elevated lines, either longitudinally or transversely.
SALTATORII, such insects that have their legs with thick thighs strong and formed for leaping.
SCUTELLUM.—This part is separated from the thorax by a transverse line, and lies between the wings or wing-cases; its form is generally triangular.
SETA, a fine hair or bristle.
SEXES *of Insects*, are distinguished in Entomological works, by ♂ (*Mars*) for male, and ♀ (*Venus*) female.
SINUS, a hollow, an excavation as if scooped out.

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SPIRACULA, the respiratory organs, situated on the sides of the abdomen.

SQUAMULA, *a Scale*; an erect membrane placed between the thorax and abdomen.

STEMMATA, the *Ocelli* or little eyes placed on the summit of the head: these are frequently considered in the character of a genus.

STERNUM, the ridge running under the breast; this part is very conspicuous in the *Dyticidæ*.

STIGMA, a spot or mark generally on the upper wing.

STRIA, a longitudinal line, and often punctured, generally extending from the base to the apex of the elytra.

Obsoleta, indistinct, as if obliterated.

STRIGA, a narrow transverse line.

SULCUS, a deep hollow furrow.

SUTURA, the part where the elytra meet and form the line in the middle of the back, from the base to the apex.

TARSUS, *the Foot*. The form and number of the joints vary according to the insect's mode of life: in several species of the *Coleoptera* the anterior tarsi of the male are frequently broader than those of the female, and consequently serve as a sexual distinction. The number of joints in the tarsi serves as sections of the Order *Coleoptera*.

TERGUM, the upper part or back of the abdomen.

TESSELLATA, spotted or marked with another colour chequerwise.

THORAX, the part intermediate to the head and body. (See p. 31.) This part is subject to the greatest variety in shape, sculpture, &c. Many of the terms used to distinguish the elytra in *Coleoptera* are also applicable to the thorax.

Aculeatus, furnished with sharp spines.

Æqualis, when of the same breadth with the elytra.

Angulatus, the posterior margin having prominent angles.

Canaliculatus, with a deep longitudinal groove in the middle.

Carinatus, the middle part of the disc raised into a straight longitudinal ridge.

Convexus, when the surface is elevated like the section of a sphere.

Cordatus, heart-shaped, the base notched, without angles.

Crenatus, the margin notched, but in such a way that the incisures are pointed to neither extremity.

Cristatus, the carinated ridge arched, dentated, and compressed.

Cucullatus, the carinated ridge hollowed before into a kind of hood.

Discus, the middle of the thorax, the line from *b* to *c* (*fig.* 4. *pl.* 10).

Gibbus, the disc elevated but not spherical.

Immarginatus, without clypeus or distinct rim.

Inæqualis, the surface not flat, but with irregular elevations and depressions.

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Integer, Integerrimus, with the margin linear and not in anywise cut.

Lineatus, marked longitudinally with coloured lines.

Lobatus, divided into distinct parts.

Marginatus, with a free elevated margin.

Margo, the part surrounding the disc.

Muticus, not furnished with horns, spines, or tubercles.

Nitidus, the surface smooth and shining.

Obcordatus, heart-shaped, with the apex towards the abdomen.

Oblongus, the transverse diameter much less than the longitudinal.

Obovatus, inversely ovate.

Obtusus, blunt, or rounded at the apex.

Orbiculatus, the transverse diameter equal to the longitudinal.

Ovalis, egg-shaped, the outline at both extremities equal.

Ovatus, the longitudinal diameter exceeding the transverse, and the latter broader at the base than at the apex.

Planus, the surface on the same plane with the head.

Punctatus, with hollow dots or punctures.

Retusus, terminating in an obtuse hollow.

Rotundatus, the outline nearly circular, without corners.

Rugosus, wrinkled, marked with waved and elevated lines, either longitudinally or transversely.

Serratus, the margin toothed like a saw.

Spinosus, the margins furnished with rigid spines.

Squarrosus, divided into elevated laciniæ.

Striatus, slightly channelled with parallel lines.

Submarginatus, the margin having a distinct rim, but neither free nor elevated.

Subrotundus, the outline nearly circular.

Sulcatus, with one or more deep hollow furrows.

Teretiusculus, nearly cylindrical.

Tetragonus, with four corners.

Transversus, linear, but transverse.

Tuberculatus, rough with rigid prominent warts or tubercles.

Villosus, covered with soft down or hair.

TIBIA, a part of the leg between the femora and tarsi.

TROCHANTERES, spines fixed to the legs to assist them in running; these are common to most of the *Carabidæ.*

VAGINA, a bivalve sheath at the mouth of many Hymenopterous and Dipterous insects sometimes articulated. Mr. Kirby uses it in *Hymenoptera* to include every part the office of which is to cover, defend, or support the tongue. *Vagina* is sometimes used for that part which contains the sting of insects.

VALVULÆ, small concave membranes inclosing the proboscis.

VENÆ, *Veins*; the vessels diffused throughout the wings; the veining

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of the wings may always be considered with great advantage in the generic characters of insects, especially such as have them transparent.

VENTER, the under part of the abdomen.

VERTEX, the crown or summit of the head.

VILLOSUS, covered with soft hair.

VITTA, a stria with a waved or furrowed margin.

Interrupta, not extending in a continued line but continued either above or below.

Repanda, with waving acute sinuses.

Undata, with waving obtuse sinuses.

UNGUES, *the Claws*, subulated hook-shaped spines at the apex of the tarsi.

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THE
ENTOMOLOGIST'S CALENDAR,

EXHIBITING THE TIME OF APPEARANCE AND HABITATION OF NEAR THREE THOUSAND SPECIES OF BRITISH INSECTS.

In forming the following Calendar, I have been anxious to render it as extensive as possible, and at the same time to introduce as many species of insects as my own knowledge of the subject, and the few works that have hitherto been published relative to British Entomology, could make it. In the times of appearance, and the situation where found, of a great number of species, I have been greatly assisted by my kind and much respected friend J. F. Stephens, Esq. F.L.S. whose rich cabinet has always been open to me, and who also has furnished me with much valuable information, derived from his own observations. In many species I have been unable to give a reference to a description, several of them being new to Britain, and hitherto undescribed; but thought it best to introduce them, as they are certainly valuable acquisitions to a cabinet.

As many of the Linnean genera have not yet been sufficiently investigated, and the species requiring a minute examination, such genera and species are distinguished by *italics*. Of these the most extensive are the *Lepidoptera*, the genera of which are the least known in any department of Entomology. Of the *Hemiptera*, *Neuroptera*, *Hymenoptera*, and *Diptera*, but little is yet known of the species, consequently a very small number is introduced: however, they may be obtained in the course of collecting. I may be censured by the scientific Entomologist for introducing the *English names* of the *Lepidoptera*, but my object has been to render this a useful work; and many collectors are acquainted with them by no other name; yet it is to be hoped that these will hereafter be discontinued, as the scientific name is as easily retained in the memory (if a person uses himself to it) as the absurd English ones in present use.

The species marked by the asterisk (*) I am rather doubtful if found in the month in which they are placed in the calendar; but such is the time of the plants on which they feed being in blossom, which is certainly a good guide to the Entomologist.

The obelisk (†) to the plant in the habitation denotes that such insects are generally found in the larva state, and should be sought for accordingly, the insect being rare or difficult to procure in the perfect state.

⊙ This mark, placed in other times of appearance, denotes that they may be found in such situations throughout the year.

As many of the *Lepidoptera* last but a few days in the perfect state, I have distinguished the time of the month in which such species appear by the following: B. beginning: M. middle: E. end;—also, *l.* larva: *p.* pupa.

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JANUARY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
34	Philoscia Muscorum	Under moss	⊙	Page 111.
35	Oniscus Asellus	Old walls	⊙	—— ——
36	Porcellio scaber	Under stones	⊙	—— 112.
37	Armadillo vulgaris	——	⊙	—— ——
1	Glomeris marginata	—— sandy places	⊙	—— 113.
2	Julus sabulosus	——	⊙	—— 114.
	Londinensis	Under moss in woods	⊙	Z.M. iii.33,t.133
	niger	Under stones, Scotland	⊙	—— 34.
	terrestris	Sandy places in woods	⊙	—— ——
	punctatus	Under bark of trees and moss	⊙	—— ——
	pulchellus	Under moss, on mountains of England and Scotland	⊙	—— 35.
	pusillus	Under stones and roots of grass	⊙	—— ——
3	Craspedosoma Raulinsii	—— Edinburgh	⊙	Page 114.
	Polydesmoides	——	⊙	—— ——
4	Polydesmus complanatus	——	⊙	—— 115.
5	Pollyxenus Lagurus	Under bark of trees	⊙	—— ——
6	Lithobius forficatus	Under stones	⊙	—— ——
	variegatus	——	⊙	Z. M. iii. 40.
	vulgaris	——	⊙	—— ——
7	Cryptops hortensis	Gardens, under stones	⊙	Page 116.
	Savignii	——	⊙	Z. M. iii. 42.
8	Geophilus subterraneus	Under stones	⊙	—— —— 44.
	maritimus	—— sea shore	⊙	—— t. 40, f. 12
	acuminatus	Moss, Battersea-fields, (Dr. L.)	⊙	—— —— 45.
	longicornis	Under stones	⊙	—— t.40. f.3,6.
1	Siro rubens	Moss	2,3,4,	Page 118.
2	Obisium trombidioides	Under stones	⊙	—— 119. [f.2.
	orthodactylum	——	⊙	Z.M.iii.51,t.141
	Muscorum	Under moss	⊙	—— —— f. 3.
	maritimum	Sea shore	⊙	—— 52. [f. 3.
3	Chelifer Hermanni	Under bark of trees	⊙	—— 49, t. 142,
	Latreillii	——	⊙	—— —— f. 5.
	Geoffroyi	——	⊙	——50.t.142.f.1.
6	Acarus domesticus	Old cheese	⊙	Page 132.
11	Cychrus rostratus	Und. st., moss, roots of trees	2,3,4,	M. 470. sp. 103.
18	Nothiophilus aquaticus	Pathways and banks of ponds	⊙	Page 148.
	biguttatus	B. of ponds, r. of grass, s. pits	⊙	M. 395. sp. 10.
20	Bembidium agile	Grassy banks	⊙	[sp. 68.
30	Agonum vaporariorum	Moist gravel-pits	5,6,	Gyll. ii. 161.
36	Sphodrus planus	Houses and cellars	2,3,4,5,	Page 152.
44	Dyschirius gibbus	Moist places, Battersea	2,3,4,5,	—— 153.
50	Dromius quadrimaculatus	Under bark of trees	2to6,	—— 155.
	rufescens	——	2to6,	Marsh. 458.sp.71
	linearis	——	2to6,	—— 463. sp. 84
	pusillus	——	2to6,	
	punctomaculatus	—— Herts(Mr.Stephens)	2to6,	—— 460. sp.74.
51	Demetrias atricapilla	——	2,3,4,	—— 462.sp.83.
56	Hyphydrus ovatus	Ponds	2to12,	Page 157.

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JANUARY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
58	Noterus sparsus	Ponds	⊙	Z. M. iii. 71.
60	Colymbetes bipunctatus	Ponds and ditches	⊙	Mars. 418. sp. 15
	uliginosus	———	⊙	—— 416. sp. 9.
	bipustulatus	Ponds	⊙	—— 415. sp. 7.
62	Acilius sulcatus	Ponds and stagnant waters	2to12,	Page 159.
63	Dyticus marginalis	———	2,4,10,12,	—— —
	circumflexus	———	2,4,10,12,	—— —
	punctulatus	———	2,4,10,12,	Marsh. 412. sp. 2
107	Stenus cicindeloides	Moist banks	⊙	Gyll. ii. 470. sp. 6.
	biguttatus	Moist banks	⊙	Page 173.
119*	Arcopagus glabricollis	Woods, under moss	2,3,	—— 178.
121*	Bryaxis hæmatica	Under moss	2,3,	Zool. Misc. iii.
124	Ptinus Fur	Houses	⊙	Marsh. 89. sp. 27.
150	Hydröus piceus	Ponds, under weeds	2to6,	Page 187
173	Sarrotrium muticum	Gr.-pits Hampst. (Mr. Steph.)	2,3,	—— 193.
179	Helops striatus	Roots of trees and under bark	⊙	Marsh. 481. sp. 5.
196	Salpingus Roboris	Under bark of trees		Page 199.
	rufirostris	———	2,3,	Mar. 297. sp. 170.
205	Apion Ulicis	Furze	2,	Kirby T. L. S. ix.
208	Rhynchænus maculatus	Under bark of trees	2,3,	Mar. 292. sp. 158.
223	Monotoma Juglandis	Stumps of trees, moist places	to 5,	Page 207
237	Rhagium vulgare	——— Coombe Wood	2,	—— 210.
254	Coccinella 7-punctata	Hedges and under bark	⊙	Marsh. 152. sp. 10.
	variabilis	———	⊙	Illig. i. 447. sp. 32
	instabilis	———	⊙	—— 161. sp. 30.
	humeralis	Under bark of oaks	⊙	Schön. ii. 163. sp. 35
	dispar	Under bark	⊙	Illig. i. 455. sp. 33
262	Acheta domestica	Houses	⊙	Fabr.
287	Nepa cinerea	Ponds and ditches	⊙	Page 225.
289	Notonecta furcata	———	2to12,	—— 226.
	glauca	———	2to12,	—— 227.
310	Pulex irritans	Houses, sucking blood of man	⊙	—— 234.
	Canis	Dogs	⊙	N.S.
324	Smerinthus Tiliæ *p.* *The Lime Hawk-moth.*	†Roots of lime-trees	2,3,	Page 243.
	Geometra primaria E. *The Early Moth*	Hedges	2,	Haw. 305. sp. 94.
	brumaria *The Winter Moth*	Pales	11,	—— sp. 93.
	Tortrix spadiceana *The Bay-shouldered Button*	Coombe Wood		—— 412. sp. 57.
440	*Formica* Herculanea	Woods, &c.	⊙	Stewart ii. 245.
	fusca	———	⊙	—— 246.
	nigra	———	⊙	—— —
	rufa	———	⊙	—— —
488	Apis mellifica	Flowers	⊙	K. ii. 312. sp. 73
489	Culex pipiens	Houses and gardens	⊙	Page 290.

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FEBRUARY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
4	Podura plumbea	Under stones		Page 141.
5	Smynthurus fuscus	Damp hedges		—— —
	Podura viridis	Buckwheat		Stewart ii. 276.
36	Sphodrus collaris	Roots of trees, Epping Forest	3,4,	M. 443. sp. 29.
88	Silpha opaca	Roots of trees		—— 120. sp. 15.
104	Staphylinus Morio	Under stones and moss	3,4,	Gyll. ii. 288. sp. 9.
110	Omalium planum	Under bark of decayed trees	3,4,	—— 221. sp. 20.
133	Byrrhus semistriatus	Roots of grass and banks	3,4,5,	—— 199. sp. 7.
138	Platysoma picipes	Under bark	3,4,	Page 184.
	flavicornis	———	3,4,	—— —
	depressus	———	3,4,	—— 185.
	oblongus	———	3,4,	Hist. O. Fabr.
140	Parnus sericeus	B. of ponds, Wandsworth Com.	3,4,	Page 185.
142	Helophorus stagnalis	Ponds and aquatic plants	3,4,5,	—— 186.
151	Hydrophilus caraboides	Ponds and ditches	3,4,5,	—— 187.
200	Bruchus ater	Furze, Coombe	6,	Marsh. 236. sp. 4.
340	Eriogaster lanestris E. *The small Eggar*	Bushy places		Page 247.
354	*Noctua* croceago E. *The orange Upper-wing*	Dried leaves	4,6,	Haw. 239.
	Geometra leucophearia E. *The Spring Usher*	Dry leaves and trunks of trees		—— 279. sp. 23.
	cæsiata E. *The February Carpet*	Skirts of woods, Peckham		—— 330. sp. 41.
	nigricaria E. *The dark-bordered Usher*	Trunks of trees		—— 279. sp. 22.
	primaria E. *The early Moth*	Hedges	11,	—— 305. sp. 94.
	Biston hispidarius E. *The small Brindle*	Trunks of oaks and sallows		—— 274. sp. 7.
	Tinea nubilea E. *The clouded Brown*	Oaks		—— 503. sp. 5.
	tortricea E. *The clouded Lead*	———		—— sp. 6.
	Salicis E. *The rosy Day-moth*	Hedges		—— 504. sp. 7.

MARCH.

9*	Drassus melanogaster	Under stones	4,	Page 123.
*	ater	———	4,	—— —
10	Clubiona lapidicola	———	4,5,	—— —
11	Aranea domestica	Houses	4,5,	—— 124.
13	Argyroneta aquatica	Ditches	4,5,12,	—— 125.
2	Forbicina polypoda	Under stones	4,	—— 140.
10	Cicindela campestris	Sandy pl., fields, pathways	4,5,6,7,	Marsh. 389. sp. 1.
12	Carabus violaceus	Roots of trees and under stones	4,5,	Page 145.
	catenulatus	———	4,5,	—— —
	nemoralis	Gardens	4,5,6,	—— —

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MARCH.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
14	Nebria brevicollis	U. stones, s.-pits, roots of tr.	4,5,	Mars.444.sp.31.
16	Panagæus Crux major	Roots of trees	7,	Page 147.
19	Elaphrus riparius	Moist banks	4,5,6,	Marsh.392.sp.4.
20	Bembidium flavipes	Roots of grass	4,	Marsh.394.sp.9.
	puncticolle	Grassy banks?	4,5,	
	crucigerum	———?	4,5,	
	Ephippium	———?	4,5,	Mars.462.sp.81.
	Guttula	———?	4,5,	Gyll.ii.27. sp.13
	rufipes	———?	4,5,	Mars.453.sp.54.
25	Harpalus obscurus	Under stones	4,5,6,	—— 437. sp.13
	apricarius	Sand-pits	4,	Gyl.ii.104.sp.22
32	Anchomenus prasinus	Under moss in hedge banks	4,	Page 151.
33	Platysma nigritum	Moist places in woods	4,5,	—— ——
34	Chlænius festivus	Moist banks and woods	4,	—— ——
36	Sphodrus terricola	Under stones	4,5,	Mars.443.sp.28.
39	Calathus cisteloides	Under bark, stones, sandy pla.	4,5,6,	Car.flavipes. M.
	cisteloides, β.	———	4,5,6,	— obscurus. M.
	melanocephalus	Moist banks, roots of trees	4,	Mars.438.sp.15.
41	Stomis pumicatus	———, Battersea	4,5,	Page 153.
43	Clivina Fossor	Under stones	4,5,	—— ——
45	Abax striola	———	4,5,	—— 154.
	angustior	———	4,5,	Mars.442.sp.26.
	melanarius	———	4,5,	Payk. i.115. sp.
46	Cymindis humeralis	Moist banks	4,5,	Page 154. [24
57	Hydroporus 12-pustulatus	Croydon canal	4,5,	Mars.422.sp.23.
	depressus	———	4,5,	—— 421.sp.22.
	linnellus	Ponds, Norfolk	4,5,	Gyll.i.529.sp.13
	granularis	Ponds and ditches		Mars.426.sp.34.
	trifidus	———	4,5,	—— 423.sp.27.
	confluens	———	4,5,	—— 424.sp.28.
59	Laccophilus hyalinus	Ponds and stagnant waters	4,5,	—— 420.sp.19.
	minutus	———	4,5,	Page 158.
64	Gyrinus Natator	——— and ditches	4,5,6,	—— 159.
70	Elater nitidulus	Sand-pits, Hampstead	6,	Mars.380. sp.12.
85	Necrophagus mortuorum	Dead animals, woods	6,	—— 115. sp. 4.
104	Staphylinus brunnipes	Hedge banks	4,5,	Gyl.ii.289.sp.10
	Erythropterus	Under stones and dung	4,5,	Page 171.
	pubescens	Under dung	4,5,	Gyll.ii.284.sp.5.
	Staphylinus punctulatus	Under stones and moss	4,5,	—— 353.sp 63.
109	Oxytelus carinatus	Dung	4,5,	Page 174.
110	Omalium rivulare	Banks of rivers, flowers & fungi	4,5,	Gyll.ii.214.sp.14.
111	Lestiva obscura	Under stones in moist places	4,5,	—— 196. sp. 4.
113	Tachinus subterraneus	Under bark of birch trees	4,	—— 252. sp. 2.
	marginellus	Under stones and dung	4,5,	—— 265.sp.12.
	analis	Under stones, moss & bark of tr.	4,5,	—— 269.sp.15.
114	Tachyporus analis	Under stones and moss	4,5,	—— 239. sp. 4.
	marginatus	———	4,5,	—— 237. sp. 2.
	nitidulus	———	4,5,	—— 242. sp. 7.

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MARCH.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
115	Aleochara obscura	Under rubbish	4,5,	Gyll. 379. sp.2.
124	Ptinus germanus	Dry rotten wood	4,	Marsh.89.sp.25.
130	Megatoma undatum	Under bark of birch trees	4,	Page 182.
133	Byrrhus Pilula	Pathways and sandy places	4,5,	Marsh.102.sp.1
	fasciatus	———	4,5,	Gyll.i. 194.sp.2.
134	Abræus perpusillus	Under dung	4,5,	Page 183.
142	Helophorus granularis	Aquatic plants in ponds	4,	Gyll.i.127.sp.2.
	griseus	———	4,	Hyd. affinis. M.
	nubilus	———	4,	Gyll.i.130.sp.6.
	Fennicus	———	4,	—— i.129.sp.5.
146	Spercheus sordidus	Stagnant waters, Windsor	4,	Page 186.
147	Berosus luridus	Ponds, Wimbledon Common	4,	Marsh.404.sp.7.
152	Sphæridium scarabæoides	Under dung	4,5,	Page 187.
	marginatum	———	4,5,	Marsh.66.sp.16.
153	Cercyon quisquilium	———	4,5,	—— 71. sp. 29.
	unipunctatum	———	4,5,	—— 70. sp. 28.
	melanocephalum	———, and in flowers	4,5,	—— 68. sp. 20.
	simile	———	4,5,	—— — sp. 21.
	laterale	———	4,5,	—— 69. sp. 23.
	terminatum	———	4,5,	—— 70. sp. 27.
	minutum	———	4,5,	—— 75. sp. 43.
	sordidum	———	4,5,	—— 69. sp. 25.
157	Geotrupes stercorarius	———	5,	Marsh.,20.sp.32
	politus	——— Coombe	4,5,	Scar.Mutator.M
	niger	———	4,5,	Marsh.22.sp.36.
	puncticollis	———	4,5,	
159	Ægialia globosa	Sandy sea shore, Swansea	4,	Page 190.
167	Cetonia aurata L.	Decayed wood, Epping Forest		Mars.41.sp.73.
170	Pedinus maritimus	Sandy sea shore, Swansea	4,	—— 192.
171	Opatrum tibiale	——— (Mr. Bydder)		
179	Helops violaceus	U. bark of trees, sandy places	4,	Marsh.480.sp.3.
183	Melandrya caraboides L.	Decayed oaks		Page 195.
214	Calandra granaria	Decayed trees	4,	—— 204. [113
	lignaria	Decayed elms	4,5,	Marsh. 275.sp..
219	Scolytus Destructor	Bark of the elm	4,5,	—— 53. sp. 6.
235	Latridius porcatus	Old wood and damp places	4,5,6,	Page 207.
226	Silvanus frumentarius	Damp cellars	4,5,6,	—— 208.
224	Mycetophagus varius	Boleti		Marsh.140, sp.5.
246	Chrysomela Litura	Furze and broom	4,	—— 182, sp.27.
250	Tritoma bipustulatum	Boleti, Coombe	4,5,	Page 214.
254	Coccinella globosa	Banks	4,5,	Illig. i.469.sp.39.
	22-punctata	Hedges	4,6,9,	—— 468. sp. 37.
	18-guttata	Under bark of firs	6,9,	—— 431. sp. 18.
286	Naucoris cimicoides	Ponds	4,5,6,	Page 225.
288	Ranatra linearis	Ponds and ditches, Epping Fo.	4,5,	—— —
289	Notonecta maculata	——— Devon	4,5,	—— 227.
290	Plea minutissima	———	4,5,	—— —
291	Sigara minutissima	Rivers and running waters	4,5,	—— —

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MARCH.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
292	Corixa coleoptrata	Ponds and ditches, Norwich	4,5,	Page 228.
	striata	Ponds	4,5,	—— —
	stagnalis	——	4,5,	—— —
	fossarum	——	4,5,	—— —
	lateralis	——	4,5,	—— —
	dorsalis	——	4,5,	—— 229.
	Geoffroyi	Ponds and ditches	4,5,	—— —
	affinis	Ponds, Devon	4,5,	—— —
417	Vanessa Atalanta	Lanes and woods	8,	—— 238.
	The red Admiral			
	Io	——	7,	—— —
	The Peacock			
	Polychloros	Near elms	6,7,	—— —
	The large Tortoise Shell			
	Urticæ	Lanes, &c.	6,9,	—— —
	The small Tortoise Shell			
320	Hipparcha Ægeria *l.*	Grassy banks	5,6,	Haworth 23.
	The speckled Wood			
326	Macroglossa Stellatarum	Bedstraw	5,8,	—— 66.
	The Humming Bird?			
354	*Noctua* rufa E.	Banks of nettles		—— 232.
	The red Chesnut			
	miniosa E.	Weedy banks		—— 241.
	The blossom Underwing			
	pusilla	Trunks of oaks		—— 244.
	The dwarf Quaker			
	luteicornis E.	Pales and trunks of trees		—— 252.
	The Yellow-horned			
	Parthenias	Blossoms of willows		—— 269. sp. 7.
	The orange Underwing			
	notha	——		—— — sp. 8.
	The light-orange Underwing			
	Geometra stictaria M.	Palings		—— 286.sp.39.
	The Dotted-border			
	Æscularia M.	——		—— 306.sp.97.
	The March Moth			
	multistrigata	Heaths		—— 306 sp.98.
	The mottled Grey			
	abietaria E.	Trunks of trees		—— 276.sp.14.
	The large Ingrailed			
	luctuaria	——		—— 279. sp.24.
	The mourning Widow			
	rufifasciata E.	Poplars		—— 361.sp.144
	The red-barred Pug			
360	Biston prodromarius B.	Trunks of oaks		—— 272. sp. 1.
	The Oak Beauty			
	pedarius E.	Trunks of trees		—— 274. sp. 6.
	The pale Brindle			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	*Crambus ocellea	Gardens		Haw. 486. sp.21
	The Necklace Veneer			
365	*Tortrix fimbriana	Oaks		—— 446.sp.164
	The brown-bordered			
	lutosa B.			—— 472.sp. 4.
	The early Nettle-tap			
	Afzeliana E.	Thick woods		—— 407. sp.42.
	The Afzelian			
	gnomana	Dry leaves, Darent Wood	9,	—— 417. sp.76.
	The Dial			
	unipunctata	Furze on commons	4,	—— 454. sp.192
	The marbled Single-dot			
	tetraquetrana	——	4,	—— sp. 193.
	The square-barred Single-dot			
	ulicetana	——	4,	—— 458,sp.204
	The light-striped Edge			
	triquetrana	——	4,	—— 454.sp.194
	The angle-barred Single-dot			
	Tinea Fagi	Trunks of trees		—— 502. sp. 1.
	The March Dagger			
	curvipunctosa B.	Hedges		—— 511. sp.19.
	The Curve-dotted			
483	Melecta punctata	Sandy places, Swansea		Page 286.
478	Osmia cornuta	Sandy places		Kir.ii.271.sp.57.
485	Anthophora retusa	Sunny sandy banks	4,5,	—— 296. sp.69.
544	Scutophaga merdaria	Cow dung		Page 300.

APRIL.

17	Tetragnatha extensa	Moist places		Page 127.
1	Trombidium holosericeum	Grassy places	5,	—— 131.
3	Gammasus Coleoptratorum	Dung of horses and oxen		—— ——
	marginatus	——		—— ——
4	*Oribita geniculata	Under stones		—— ——
5	*Notaspis humeralis	——		—— 132.
8	Uropoda vegetans	Dung beetles	5,	—— ——
10	Hydrachna geographica	Ponds	5,	—— 133.
1	Lepisma saccharina	Houses, old papers, &c.	5,	—— 140.
12	Carabus morbillosus	Under stones in moist places	5,6,	—— 145.
	clathratus	Near Halvergate Marsh, Nor.		Tr.Ent.Soc.338.
14	Nebria Gyllenhalli	Mountainous places, sea shore	5,	Gyll.ii. 40. sp.3.
15	Leistus brunneus	Sandy places	5,6,	
	rufescens	——	5,6,	Mars.458.sp.71.
17	Badister bipustulatus	——	5,6,	Page 147.
19	Elaphrus uliginosus	Moist pl. Battersea, Coombe	5,6,	Marsh.392.sp.5.
20	Bembidium acutum	Sandy places	5,6,	—— 461. sp.80.
	ustulatum	Moist places,	56,	Gyll.ii. 29.sp.15.
	4-guttatum	—— Lessness Heath	5,6,	Marsh.459.sp.73

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
20	Bembidium littorale	Moist banks	5,6,	Mar. 452.sp.51.
22	Trechus meridianus	Gardens and roots of grass	5,6,	—— 454. sp.58.
	fulvus	Sandy places	5,6,	—— 456. sp.64.
25	Harpalus ruficornis	Under stones in sandy places	5,6,	—— 436. sp.11.
	bicolor, var. β.	———	5,6,	—— sp. 12.
	binotatus	Moist banks, Battersea	5,6,	
	azureus	Sandy places	5,6,7,	—— 450.sp.46.
	erythropus	Grassy banks	5,6,	—— 461. sp.78.
	ferrugineus	Sandy places	5,	—— 440. sp.21.
27	Oodes helopoides	Roots of grass, moist banks,	Bat. 5,	Page 150.
28	Loricera ænea	Roots of grass, gardens	5,6,	Page 150.
30	Agonum cærulescens	Moist places	5,6,	Mar. 446.sp.37.
	albipes	Moist banks, Battersea	5,6,	—— 450.sp.44.
	sordidus	———	5,6,	—— 457. sp.68.
	picipes	———	5,6,	
	Simpsoni	———		
	rufipes	Under stones, moist places		Gyll.ii.97. sp.16
31	Synuchus rivalis	Moist banks		Page 151.
37	Amara vulgaris	Sandy places, pathways	5,6,	Mars.438.sp.16.
38	Blethisa multipunctata	Moist banks, Battersea	5,	Page 152.
40	Pœcillus nigricornis	Moist banks	5,6,	Mars.441.sp.24.
	dimidiatus	Sandy places, pathways	5,6,	—— 445.sp.35.
42	Broscus cephalotes	Sea shore, Swansea	5,	Page 153.
43	Clivina sanguinea	Gardens, Lambeth, (Dr. Leach)	5,6,	Leach's MSS.
51*	Demetrias monostigma	Roots of plants near Swansea		———
54	Haliplus ferrugineus	Ponds and ditches	5,6,	Page 157.
	flavicollis	———	5,6,	Mars.430.sp.47.
	lineatocollis	———	5,6,	—— 429. sp.45.
	ruficollis	———	5,6,	—— 428. sp.43.
	impressus	———	5,6,	Gyll.i. 547.sp.3.
	assimilis	———	5,6,	Mars.429.sp.44.
	obliquus	———	5,6,	Gyll.i.550.sp.5.
57	Hydroporus unistriatus	Ponds	5,6,	—— 554.sp.28.
	lituratus	———	5,6,	Mars.423.sp.26.
	planus	———	5,6,	—— 425. sp.30.
	humeralis	———	5,6,	—— 423. sp.24.
	fluviatilis	——— (Dr. Leach)	5,6,	
58	Noterus Geerii	Ponds and ditches	5,	Zool.Misc-iii.71.
60	Colymbetes politus	Ditches in marshes	5,	Mars.419.sp.16.
	striatus	Ponds and ditches	5,	—— 414. sp. 4.
61	Hydaticus transversalis	Ponds, Battersea		Dyt. parapleurus. M.
64	Gyrinus æneus	Ponds and ditches	5,	
70	Elater murinus	Under stones in sandy places	5,6,	—— 385.sp.26.
	obscurus	———	5,6,7,	—— 377. sp. 4.
83	Opilus mollis	Dry rotten willows	4,	Page 166.
85	Necrophagus vestigator	Sandy places, Hampstead		
88	Silpha obscura	Under stones, pathways	5,6,	Mars.118.sp.10.
	tristis	Sandy places under stones	5,6,	—— 117. sp. 7.
89	Phosphuga atrata	Pathways	5,6,	—— 116. sp. 6.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
92	Choleva oblonga	Under moss and stones	5,6,	Page 168.
	agilis	Dung on heaths	5,6,	Linn.Tr.xi. 140.
93	Catops sericeus	Under moss	5,6,	—— 142.
	chrysomeloides	Dung on heaths	5,6,	—— 146.
	nigricans	———	5,6,	—— 141.
94	Ptomophagus villosus	———	5,6,	—— 152.
	truncatus	———	5,6,	Illig. 42. sp. 4.
	fumatus	———	5,6,	Linn.Tr.xi. 155.
95	Mylæchus brunneus	———	5,6,	Page 169.
102*	Cateretes rufilabris	Junci near Hull		Page 170.
	bipustulatus	Banks, Battersea, (Dr. Leach)		Gyll.i.248. sp.3
104	Staphylinus murinus	Under dung	5,6,	——ii.283. sp.4
	hybridus	——— and stones	5,6,	Marsh.500.sp.9.
	castanopterus	———	5,6,	Gyll. 295.sp.14.
	stercorarius	———	5,6,	—— 296.sp.15.
	æneocephalus	U. stones and moss moist places	5,6,	—— 291.sp.12.
	tristis	———	5,6,	—— 301.sp.19.
	picipennis	Under dung and stones	5,6,	
	hæmorrhous	———	5,6,	
	splendens	———	5,6,	—— 297.sp.16.
	politus	———	5,6,	—— 317.sp.33.
	decorus	——— stones and moss	5,6,	—— 316. sp.32.
	laminatus	———	5,6,	—— 298.sp.17.
	maculicornis	——— and stones	5,6,	
	marginatus	——— stones and moss	5,6,	—— 322. sp.38.
	marginellus	———	5,6,	
	fucicola	———	5,6,	
	lateralis	———	5,6,	
	sanguinolentus	———	5,6,	—— 338.sp.54.
	lituratus	———	5,6,	
	obscuripennis	———	5,6,	
	fimetarius	———	5,6.	—— 324.sp.40.
	pilipes	———	5,6,	
	semiobscurus	———	5,6,	
	varians	———	5,6,	—— 342.sp.58.
	nitipennis	———	5,6,	
	attenuatus	——— moist places	5,6,	—— 311.sp.27.
	bipustulatus	———	5,6,	—— 339.sp.55.
	concinnus	———	5,6,	
	olens	Roots of trees and under stones	10,	—— 285. sp.6.
	similis	Under stones	5,	—— 287. sp. 8.
	maxillosus	Under dung and in dead anim.	5,6,	Page 172.
105	Lathrobium elongatum	Putrid veget. and und. stones	5,6,	——
	quadratum	Moist banks and under stones	5,	Gyll.ii. 367.sp.4.
	dentatum	———	5,	
106	Pæderus riparius	——— and under stones	5,	Page 172.
	orbiculatus	Under stones and moist banks	5,	Gyll.ii. 374.sp.3.
	immunis	Sandy places	5,	
	melanocephalus	———	5,	

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
106	Pæderus angustatus	Under stones in sandy places	5,	Gyll. ii.375.sp.4.
107	Stenus pubescens	Moist banks	5,	
	Juncorum	———	5,	
	oculatus	———	5,	—— 471. sp. 7.
	nigricornis	———	5,	
*	angustatus	———		
	rufitarsis	———	5,6,	
	flavicornis	———	5,6,	
	pusillus	———	5,6,	
	brunnipes	———	5,6,	
	aceris	———	5,6,	
	rugulosus	———	5,6,	
109	Oxytelus opacus	Dung and sandy places	5,6,	
	angustatus	———	5,6,	
	armatus	———	5,6,	Tr.Ent.Soc.i.97.
110	Omalium depressum	Cow dung	5,6,	—— 210. sp.11
111	Lestiva caraboides	Under stones, on palings, &c.	5,6,	—— 192. sp. 1.
113	Tachinus rufipes	Dung	5,	Page 176.
114	Aleochara canaliculata	Sandy places and under stones	5,6,	Gyll.ii.391.sp.14
	fuscipes	Under dung	5,	—— 428.sp.50.
	sulcata	———	5,	—— 373. sp. 1.
	lanuginosa	———	5,	—— 432.sp.54.
121	Bryaxis longicornis	Roots of grass, Battersea	5,	Page 179.
	sanguinea	———	5,	Zool. Misc. iii.
*	Juncorum	*Junci*, Norfolk	5,6,	——
122	Pselaphus Herbstii	Moist places	5,6,	Page 179.
124	Ptinus ovatus	Houses	5,6,7,	Marsh.90.sp.28.
	cereviciæ	———	5,6,	—— sp. 29.
125	Gibbium sulcatus	——— and old paper	5,6,7,	Page 180.
*	Scotias	Bristol		—— ——
126	Ptilinus pectinicornis	Old trees and houses	5,6,	—— 181.
127*	Anobium Abietis	Trees, Norfolk		Gyll. i.297.sp.9.
128	Dermestes lardarius	Houses	5,6,	Page 181.
131	Anthrenus Museorum	Museums	5,	Gyll.i.162.sp.3.
133	Byrrhus murinus ?	Sandy places	5,	—— 198. sp. 5.
	dorsalis	———	5,	Marsh.104.sp.6.
	varius	Roots of trees	5,	Gyll.i.197.sp.4.
135	Onthophilus striatus	Dung	5'	Fabr.
136	Hister sinuatus	———	5,6,	Illig. i. 57.
	4-notatus	———	5,	—— 58.
	parvus	———	5,	Marsh. 93.sp.3.
	stercorarius	———	5,	Payk. Mon. 40.
	neglectus	———	5,	Megerle
	carbonarius	———	5,	Gyll.i.82.sp.10.
	purpurascens	———	5,	Fabr.
140	Parnus prolifericornis	Banks of ponds		Marsh. ?
141	Heterocerus marginatus	Marshy pl. and muddy banks	5,	Page 185.
143	Hydrochus elongatus	Aquatic plants, Battersea		Fabr.
148	Hydrobius fuscipes	Ponds	5,	Page 187.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
148	Hydrobius calconotus	Ponds	5,	
	bipustulatus	———	5,	Mars.406.sp.13.
	atricapillus	———	5,	
	torquatus	———	5,	—— 405. sp.10.
	melanocephalus	———	5,	Page 187.
	orbicularis	———	5,	Marsh.403.sp.4.
	fulvus	———	5,	—— 408.sp.20.
	griseus	Ponds and ditches	5,	Gyll.i.122.sp.11
	minutus	———	5,	Mars.406.sp.12.
	seminulus	———	5,	Gyll.i.116.sp.5.
	marginellus	———	5,	Payk.i.186.sp.11
149	Limnebius nitidus	———	5,	Page 187.
	mollis	———	5,	Mars.407.sp.16.
	nigrinus	——— [Bexley	5,	
154	Copris lunaris	Under dung, Charlton: lanes	5,	Page 188.
155	Onthophagus Vacca	———	5,	——
	nuchicornis	———	5,	Marsh.32.sp.57.
	Xiphias	———	5,	—— 33. sp. 59.
	verticicornis	———	5,	—— 34. sp. 60.
	nutans	———	5,	—— 35. sp. 62.
	ovatus	———	5,	—— sp. 63.
*	Dillwynii	———, Swansea, (Mr. Dillwyn)	5,	Leach, MSS.
156	Aphodius rufipes	———	5,	Marsh.25.sp.42.
	luridus	———	5,	—— 27. sp.45.
	depressus	———	5,	T.Ent.Soc.i.246
	Sus	———, Swansea	5,	Mars. 29.sp.50.
	merdarius	———	5,	—— 30. sp. 52.
	testudinarius	———, Hampstead		—— 28. sp. 49.
	Fossor	———	5,	—— 16.sp. 24.
	subterraneus	———	5,	—— 18. sp. 29
	erraticus	———	5,	—— 9. sp. 5.
	unicolor	———	5,	—— 11. sp. 9.
	fimetarius	———	5,	—— 10. sp. 7.
	coprinus	———	5,	—— 12. sp. 11.
	scutator	———	5,	—— 11. sp. 8.
	conflagratus	———	5,	—— sp. 10.
	sordidus	———	5,	—— 10. sp. 6.
	ictericus	———	5,	Tr.Ent.Soc.i.80.
	fœtens	———	5,	Mars.17. sp. 25.
	attaminatus	———	5,	—— 13. sp.15.
	inquinatus	———	5,	—— 13.sp. 14.
	fœdatus	———	5,	—— 14. sp. 16.
	hæmorrhoidalis	———	5,	—— 19. sp. 30.
	terrestris	———	5,	—— 17. sp. 26.
	humeralis	———, Bristol	5,	Panz.
	pusillus	———	5,	Mars. 18. sp.27.
	obscurus	———	5,	—— 18. sp. 28.
	granarius	———	5,	—— 19. sp. 31.
	turpis	———, Norfolk	5,	—— 15. sp. 21.
157	Geotrupes sylvaticus	———, Lessness Heath	5,	—— 23. sp. 38.

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
157	Geotrupes vernalis	Under dung, Lessness Heath	5,	Marsh. 23. sp. 37.
158	Typhæus vulgaris	——— Epping Forest	5,	Page 189.
161	Trox sabulosus	Sandy places, Coombe Wood	5,	—— 190.
	arenarius	Gardens, under dry bones, stones, &c.	5,6,	Marsh. 25. sp. 41.
169	Blaps mortisaga	Cellars	5to9,	Page 192.
172	Tenebrio molitor	Houses, in meal and flour	5,6,	—— 193.
180	Cistela nigra	Hedges and lanes	5,	Marsh. 221. sp. 5.
192	Melöe brevicollis	Meadows, Devon, (Dr. Leach)		Leach T.L.S. xi.
	violaceus	Meadows and sunny banks	5,	—— ——
	proscarabæus	———	5,	—— ——
205	Apion immune	Broom and furze	5,6,	Kirby T.L.S. ix.
208	Rhynchænus nigrirostris	Moist pl. & banks of ponds	5,	Marsh. 267. sp. 89.
210	Liparus squamiger	Sandy pl. and nettles, Hertf.	5,	—— 301. sp. 182.
	vastator	———	5,	—— 300. sp. 180.
	asper	Nettles and hedges	5,	—— 301. sp. 181.
	sexstriatus	Hampstead	5,	—— 305. sp. 195.
215	*Cossonus linearis	Trunks of trees, Windsor For.		Page 204.
225	Latridius transversus	Hedges and sandy places	5,	Marsh. 109. sp. 10.
	rugicollis	———	5,	—— 113. sp. 23.
	ruficollis	———	5,	—— 111. sp. 17.
	impressus	———	5,	—— 110. sp. 11.
227	Lyctus oblongus	Old wood and palings	5,	—— 107. sp. 3.
228	Trogosita mauritanica	Under stones in moist places	5,	Page 208.
230	Lamia minuta	Hedges		Marsh. 337. sp. 21.
246	Chrysomela tenebricosa	Var. plants in hedges & lanes	5,6,	—— 169. sp. 1.
	coriaria	Heaths	5,6,	—— 170. sp. 2.
	gœttingensis	Heaths and sandy places	5,6,	—— 171. sp. 4.
	Polygoni	Knotgrass	5,	—— 178. sp. 19.
	ænea	Palings	5,	—— 181. sp. 24.
	polita	Nettles	5,	—— 188. sp. 43.
	staphylea	———	5,	—— 186. sp. 41.
	sanguinolenta	Sandy places, Charlton	5,	—— 190. sp. 48.
	limbata	———	5,	—— 191. sp. 49.
	marginella	Weedy banks	5,	—— 181. sp. 25.
254	Coccinella oblongo-guttata	Pines, Hertford		—— 162. sp. 34.
257	Lycoperdina Bovistæ	Puff-balls on commons		Page 216.
261	Gryllotalpa vulgaris M.	Gardens, fields of peas, banks of streams	5,6,	—— 217.
283	Velia rivulorum	Running waters	5,6,	—— 224.
284	Gerris paludum	Ponds and ditches	5,6,	—— ——
285	Acanthia maculata	Grassy places	5,6,	—— 225.
315	Melitæa Cinxia *l.* M. *The Glanville Fritillary*	Ribwort, plantain in meadows		Haworth 36.
	Artemis *l.* M. *The greasy Fritillary*	Devil's-bit, woods & ch. places		——, 36.
320	Hipparchia Ægeria B. *The speckled Wood*	Borders of woods and fields	6,8,	Page 241.

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
322	Lycæna Phlæas B.	Grassy commons	6,8,	Page 241.
	The common Copper			
	Dorylas *l.* E.	Grassy banks	7,	Haworth 45.
	The common Blue			
	Argus *l.* E.	———		—— 46.
	The studded Blue			
	Idas *l.* E.	———	6,	—— —
	The black-spot Brown			
326	Macroglossa Stellatarum E.	Gardens	6,9,	Page 244.
	The Humming-bird			
341	Endromis versicolor M.	Trunks of trees		—— 247.
	The Kentish Glory			
340	Closteva curtula E.	Trunks of poplars		Haw. 130. sp. 89.
	The chocolate Tip			
	Bombyx Coryli B.	Skirts of woods	7,	—— 102. sp. 32.
	The nut-tree Tussock			
352	*Phyois* Pelionella	Houses	5,6,	Page 249.
354	*Noctua* tetra	Gardens	6,	Haw. 162. sp. 12.
	The Mahogany			
	fissina	Shady pales and rails		—— 166. sp. 19.
	The twin-tailed Shark			
	Scrophulariæ B.	Gardens		—— 167. sp. 21.
	The water Betony			
	operosa E.	Pales and trunks of trees		—— 185. sp. 69.
	The early Grey			
	ridens M.	Trunks of oaks		—— 202. sp. 117.
	The frosted Green			
	seladonia M.	Skirts of woods	10,	—— 199. sp. 111.
	The brindled Green			
	aprilina M.	———	10,	—— 200. sp. 112.
	The Marvel du Jour			
	gothica M.	Hedges		—— 226. sp. 192.
	The Hebrew Character			
	croceago E.	———	2,6,	—— 238. sp. 227.
	The orange Upper-wing			
	fuscata B.	Oaks and sallows		—— 241. sp. 234.
	The dark Drab			
	angusta	Sallows		—— — sp. 236.
	The dark Drab, var.			
	subsetacea B.	Sallows and osier beds		—— — sp. 237.
	The dark Drab, var.			
	nebulosa	Sallows		—— — sp. 238.
	The dark Drab, var.			
	sparsa E.	Sallows and osier beds		—— 242. sp. 239.
	The powdered Quaker			
	geminata B.	Trunks of oaks		—— — sp. 240.
	The twin-spotted Drab			

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua* bimaculata B.	Trunks of oaks?		Haw. 242. sp. 241.
	The ferrugineous Drab			
	subplumbea B.	———		—— — sp. 242.
	The lead-coloured Drab			
	pallida	——— of trees	5,	—— — sp. 243.
	The pale Quaker			
	Cerasi B.	——— of willows		—— 243. sp. 244.
	The common Quaker			
	juncta B.	———		—— — sp. 247.
	The common Quaker, var.			
	nana B.	———		—— 244. sp. 249.
	The small Quaker			
	libatrix E.	Poplars and pales	8,	—— — sp. 250.
	The Herald			
	Geometra illunaria E.	Shady groves		—— 292. sp. 58.
	The early Thorn			
	badiata B.	Skirts of woods		—— 325. sp 27.
	The Shoulder-stripe			
	cervinata B.	Gardens and pales		—— 318. sp. 6.
	Scarce Tissue			
	suffumata	Open places in woods		—— 323. sp. 21.
	The water Carpet			
	quadrimaculata	Pathways and woods		—— 343. sp. 80.
	The pinion-spotted Yellow			
	congeneraria B.	Trunks of trees		—— 273. sp. 4.
	The forked-striped Brindle			
	fumaria B.	Oaks		—— 273. sp. 5.
	The dark Brindle			
	Cratægaria B.	Hedges and woods	6,8,	—— 298. sp. 74.
	The Brimstone			
	dentistrigata M.	Trunks of trees, Coombe W.		—— 320. sp. 11.
	The early Tooth-striped			
	viretata	Pathways in woods		—— 329. sp. 39.
	The brindle-barred Yellow			
	insulata E.	Woods	5,	—— 330. sp. 43.
	The insulated Carpet			
	bidentaria E.	Skirts of woods	6,	—— 291. sp. 55.
	The scalloped Hazel			
360	Biston hirtarius	Trunks of trees		—— 273. sp. 3.
	The brindled Beauty			
365	*Tortrix* Lœflingina	Hedges	5,6,	—— 420. sp. 82.
	The Lœflingian			
	subsequana	———		—— 448. sp. 173.
	The faint Silver-striped			
*	fraternana	———		—— 449. sp. 174.
	The cinereous Silver-barred			
	perlepidana	———	5,	—— 458. sp. 206.
	The beautiful Crescent			

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APRIL.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	**Tinea* Pyralea	Nettles in hedges, Coombe W.	5,	Haw. 499. sp. 4.
	The yellow-stigmaed Grey			
	Alstrœmeri	Hedges		—— 508. sp. 10.
	The Alstrœmer			
	signosa	——— ? Chelsea		—— 508. sp. 11.
	The red Letter			
	purpurea	——— ?		—— 511. sp. 20.
	The lesser Purple			
374	Alucita hexadactyla	Houses	5,9,	—— 480. sp. 21.
	The six-cleft Plume			
401	Trichiosoma laterale	Coombe Wood		Zool. Misc. iii. 109.
468	Andrena Rosæ	Flowers		Kirby ii. 83, sp. 39.
	pratensis	———		—— 100. sp. 48.
	thoracica	———		—— 101. sp. 49.
	nitida	Blossoms of willows	5,	—— 104. sp. 51.
	nigro-ænea	———		—— 109. sp. 54.
	atriceps	———		—— 114. sp. 55.
	varians	Blossoms of apple-trees		—— 117. sp. 58.
	Gwynana	Flowers		—— 120. sp. 60.
	spinigera	Blossoms of willows		—— 123. sp. 63.
	armata	———		—— 124. sp. 64.
	fulva	Flowers in gardens	5,	—— 128. sp. 68.
	Clarkella	Heaths, Hampstead		—— 130. sp. 69.
	Smithella	Blossoms of willows		—— 131. sp. 70.
	nigriceps	———		—— 134. sp. 73.
	chrysocelis	Flowers	5,	—— 143. sp. 82.
	Lewinella	———		—— 148. sp. 88.
	parvula	———		—— 162. sp. 103.
487	Bombus campestris	———	5,	—— 335. sp. 88.
	subinterruptus	Blossoms of sallows	5,	—— 356. sp. 99.
	Stylops Melitta	Melitta nigro-ænea	5,	—— i. 111.
498	Beris nigritarsis	Palings near meadows	5,	Page 291.
	clavipes	———	5,	Panz. ix. 119.
520	Bombylius major	Open places in woods		Page 295.
	medius	———		Linn. i. 1009. sp. 2.
550	Musca vomitoria	Houses and hedges	5to8,	—— 989. sp. 67.
	domestica	Houses		—— 990. sp. 69.
554	Tachina fera	Skirts of woods		Page 201.

MAY.

8	Geophilus electricus	Under stones		Page 117. [f. 4.
3	Chelifer Muscorum	Museums	6,7,8	Z.M. iii. 50. t. 142.
14	*Syctodes thoracicus	Houses		Page 126.
21	*Dolomedes mirabilis	Woods	6,7,	—— 129.
22	Salticus scenious	Walls and palings	6,7,	—— —
7	Ixodes Ricinus	Dogs	6,	—— 132.
11	Limnochares holosericea	Ponds	6,	—— 135.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
3	Petrobius maritimus	Sea shores		Page 141.
11	Cychrus rostratus	Pathways and woods	6,7,	Marsh.470.sp.103.
12	Carabus intricatus E.	N. the riv. Tavy, Devon, (Dr.L.)		Page 145.
	monilis	Gardens and pathways	6,7,8	—— —
	nitens	Moist pl. and sand-pits, Hants	6,	Marsh. 435. sp. 8.
14	Nebria complanata	U. wood, sandy shores, Swansea	5,	Page 146.
15	Leistus cæruleus	Sandy places under stones	6,	—— 147.
	Raulinsii	Near Ipswich, (Mr. Stone)	9,	New species.
16	Panagæus crux major	Sandy places	3,7,	Page 147.
20	Bembidium flavipes	Sand-pits, Bexley	6,	Marsh. 394. sp. 9.
*	pallipes	Croome, Norfolk		
21	Cillenus lateralis	Sea sho., Porto Bello, (Dr. L.)	6,7,	Page 148.
22	Trechus aquaticus	Moist places, Battersea	6,	Marsh. 461. sp. 77.
	discus	Gardens, Lambeth, (Dr. Leach)		Fabr.
30	Agonum sexpunctatum	Moist places, Coombe, & Batt.	6,	Page 151.
	vaporariorum	Sandy places	6,	Gyll. ii. 161. sp. 68.
40	Pœcillus cupreus	Sandy places and pathways	6,7,	Marsh. 439. sp. 18.
47	Brachinus crepitans	U. stones, Gravesend, (Mr. Steph.)		Page 154.
48	Lamprias chlorocephala	Broom	6,	—— 155.
53	Drypta emarginata	Ch. places, Hastings & Faversh.	6,	—— 156.
54	Haliplus elevatus	Running streams, Bexley	6,	—— 157.
57	Hydroporus flexuosus	Ponds and ditches, Hampst.	6,	Marsh. 425. sp. 31.
60	Colymbetes collaris	Ponds? Norfolk	6,	Gyll. i. 485. sp. 19.
	conspersus	——— ?	6,	—— 482. sp. 16.
	notatus	——— ?	6,	—— 483. sp. 17.
	maculatus	Running streams		Marsh. 418. sp. 14.
	abbreviatus	Ponds		Gyll. i. 488. sp. 22.
	obscurus	Ponds and ditches		Marsh. 414. sp. 5.
64	Gyrinus marinus	Salt marshes	6,	Gyll. i. 143. sp. 4.
	minutus	Bristol	6,	Marsh. 100. sp. 2.
	elongatus	Salt marshes	6,	—— 100. sp. 4.
	villosus	Rivers and running waters		Page 159.
70	Elater tessellatus	Willows	6,	Marsh. 386. sp. 27.
	balteatus	——— and hedges	6,	—— 384. sp. 23.
	niger	Hedges		Gyll. i. 406. sp. 36.
	æneus	Under stones, in sand-pits		Linn. ii. 655. sp. 31.
	holosericeus	Birch-trees, Coombe Wood	6,	Marsh. 386. sp. 28.
	lineatus	Hedges	6,	—— 387. sp. 5.
	sputator	———	6,	—— 384. sp. 24.
	minutus	———	6,	—— 381. sp. 17.
	castanipes	———	6,7	—— 381. sp. 15.
	marginatus	———	6,	—— 379. sp. 9.
	unicolor	———	6,	—— 379. sp. 8.
	mesomelus	Skirts of woods	6,	—— 378. sp. 6.
	mesomelus, var.	———	6,	—— —— 7.
72	Elodes pallida	White thorn & umbel. plants	6,	—— 227. sp. 20.
	melanura	Hedges	6,	Gyll. i. 366. sp. i.
	mollis	———	6,	Marsh. 225. sp. 15.
	nigricans	———	6,	—— 226. sp. 17.

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
77	Telephorus fuscus	Hedges in lanes	6,7,	Page 164.
	obscurus	———	6,7,	Marsh. 365. sp. 2.
	lateralis	Hedges	6,7,	Linn. ii. 648. sp. 6.
	ruficollis	———	6,7,	Marsh. 366. sp. 3.
	lividus	———	6,7,	—— — sp. 4.
	rufus	———	6,7,	Gyll. i. 350. sp. 26.
	melanurus	———	6,7,	Marsh. 368. sp. 7.
	testaceus	———	6,7,	—— 367. sp. 5.
	pallidus	Hedges and wood-sides	6,7,	—— 368. sp. 6.
	fulvicollis	———	6,7,	Payk. i. 266. sp. 12.
78	Malthinus flavus	Hedges and woods	6,7,	Page 164.
	immunis	———	6,7,	Marsh. 374. sp. 20.
	humeralis	———	6,7,	—— 374. sp. 19.
79	Dasytes ater	Moss and grass	6,	Page 164.
	æneus	Pales and posts, wood-sides	6,	Marsh. 230. sp. 3.
80	Malachius æneus	Hedges	6,7,	Page 165.
	biguttatus	Hedges and woods	6,	Marsh. 372. sp. 15.
84	Necrobia ruficollis	Dried bones	6,	Page 166.
	violacea	———	6,12	Marsh. 323. sp. 3.
	Tillus Quadra	———	6,	—— 323. sp. 4.
85	Necrophagus spinipes	Fungi and dead animals	6,	
	humator	Dead animals, banks of rivers Plaistow Marshes	6,	—— 114. sp. 2.
	* Germanicus	Dead animals and woods		—— 114. sp. 1.
	Anglicanus	———, marshes	6,	
	vespillo	Fungi and dead animals	6,	—— 114. sp. 3.
86	Necrodes littoralis	Dead animals, river sides	6,	—— 116. sp. 5.
87	Oiceoptoma thoracica	Dead animals, woods	6,	Page 167.
	rugosa	———	6,	Marsh. 120. sp. 16.
	sinuata	———	6,	—— 120. sp. 14.
88	Silpha opaca	Under stones in sandy places	6,	—— 120. sp. 15.
	4-punctata	Oaks	6,	—— 118. sp. 9.
	lævigata	Sandy places	6,	—— 119. sp. 12.
90	Scaphidium 4-maculatum	Fungi and rotten wood	6,	Page 168.
97	Engis humeralis	Bark of trees and boleti	6,	Gyll. i. 203. sp. 2.
	rufifrons	———	6,	—— 204. sp. 4.
99	Nitidula bipustulata	Dry bones on heaths & woods	6,7,	Marsh. 129. sp. 1.
	rufipes	Flowers in hedges & sides of woods	6,7,	—— 130. sp. 4.
	nigrina	Flowers in hedges	6,7,	—— 138. sp. 27.
	ænea	———	6,7,	—— 131. sp. 8.
	Urticæ	———, and nettles	6,	
	erythropa	Flowers in hedges	6,	—— 132. sp. 10.
100	Ips 4-maculata	Und. bark, New Forest Hants	6,	—— 130. sp. 2.
	ferruginea	———	6,	
101	Biturus tomentosus	Blossom of the white-thorn	6,	Page 170.
	fumatus	White thorn hedges	6,	Marsh. 65. sp. 11.
103	Micropeplus Porcatus	Sandy places, Bexley	6,	Page 171.
	staphylinoides	———	6,	Marsh. 137. sp. 25.

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
107*	Stenus cærulescens	Moist banks & sides of rivers	6,	Gyll. ii. 463. sp. 1.
108	Oxyporus rufus	Boleti and other fungi	6,7,	Page 174.
110	Omalium melanocephalum	Flowers	6,	Marsh. 127. sp. 39.
	striatum	———	6,	Gyll. ii. 231. sp. 28.
	grossum	Sandy places	6,	
113	Tachinus lunulatus	Fungi	6,	—— 274. sp. 20.
116	Lomechusa emarginata	Dry sandy places und. stones	6,	Page 177.
	dentata	———	6,	Gyll. ii. 441. sp. 4.
117*	Euplectus Reichenbachii	——— ? Norfolk (Mr. Curtis)		Page 178.
118*	Bythinus securiger	——— ? Norf. (Mr. J. Hooker)		Zool. Misc. iii.
119*	Arcophagus clavicornis	Sandy pl., Swans. (Mr. Millard)	6,	—— ——
	bulbifer	——— ? Norfolk (Mr. Sims)	6,	Page 178.
121*	Bryaxis impressa	——— ? Norfolk (Mr. Wilkin)	6,	—— 179.
	fossulata	——— Bexley	6,	Zool. Misc. iii.
122*	Pselaphus Hiesii	——— ? Norfolk		—— 87.
	longicollis	——— ? Norfolk		Zool. Misc. iii.
	Dresdensis	——— ? Bristol (Mr. Millar)		—— ——
124	Ptinus Musæorum	Edinburgh	6,	
	Lichenum	Old palings, Wandsworth	6,	Marsh. 89. sp. 26.
	rufipes	Hedges	6,	—— 83. sp. 5.
127	Anobium striatum	Houses	6,7,	Page 181.
128	Dermestes tessellatus	Dead animals	6,	Marsh. 61. sp. 3.
129	Attagenus Pellio	Houses	6,7,	Page 182.
131	Anthrenus Scrophulariæ	Flowers	6,	—— ——
	Verbasci	———	6,7,	Marsh. 101. sp. 2.
136	Hister unicolor	Dung and dead animals	6,	Gyll. i. 74. sp. 1.
	cadaverinus	———	6,	Payk.
	12-striatus	Dung	5,6,	——F.S.i.39.sp.6.
	speculifer	———	6,	Latr.
137	Deudrophilus punctatus	Under bark		Page 184.
138	Platysoma picipes	———		—— ——
139*	Limnius Valckmari	Roots of grass, banks of rivers	6,7,	—— 185.
143	Hydrochus crenatus	Aquatic plants, Norfolk		Fabr.
	brevis	———	6,	Gyll. i. 132. sp. 8.
144	Ochthebius riparius	Ponds and ditches	6,	Page 186.
	pygmæus	———	6,	Gyll. i. 133. sp. 9.
	marinus	———	6,	—— 134. sp. 10.
145	Hydræna Kugellani	———	6,	Page 186.
155	Onthophagus Cœnobita	Under dung in sandy places	6,	Marsh. 33. sp. 58.
160	Psammodius sulcicollis	Sandy pl. Swansea (Mr. Millard)		Page 190.
163	Melolontha vulgaris	Various trees	6,	—— ——
	brunneus	Hedges and dead animals	6,	Marsh. 38. sp. 67.
166	Trichius nobilis	Flowers of the dog-rose	6,	Page 191.
167	Cetonia aurata	Rose-trees and umbell. plants	6,	Marsh. 41. sp. 73.
171	Opatrum sabulosum	Sandy places, Coombe Wood		Page 193.
180	Cistela murina	Hedges and woods	6,	Marsh. 222. sp. 7.
183	Melandrya caraboides	Under bark of trees	6,	Page 195.
184	Lagria hirta	Hedges	6,	—— 196.
185	Pyrochroa rubens	———	6,	—— ——

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187	Notoxus monoceros	Sandy pl.Charlton & Swansea	6,	Page 196.
188	Anthicus fuscus	Dung near stables		—— —
	floralis	Flowers in gardens	6,	Marsh. 485. sp. 2.
190	Mordella aculeata	White-thorn hedges	6,	Page 197.
	abdominalis	——— and umbellate plants	6,	Marsh. 489. sp. 4.
	bicolor	———	6,	—— 490. sp. 8.
	ferruginea	———	6,	—— — sp. 6.
191	Anaspis frontalis	White-thorn	6,	Page 197.
	ruficollis	Umbellate plants	6,	Marsh.491.sp.11.
	obscurus	———	6,	—— 492. sp. 14.
	bifasciatus	White-thorn	6,	—— 493. sp. 18.
	biguttatus	———	6,	—— 492. sp. 12.
192	Melöe variegatus	Faversham, (Mr. Crowe,) Margate, (Mr. Milne)		Leach Tr.L.Soc.xi.
	cicatricosus	Margate, (Mr. Milne)		—— ——
198	Anthribus scabrosus	Elm and horse-chesnut		Page 200.
*	varius	White-thorn		Panz.
200	Bruchus Pisi	Pea-fields & willows,Coombe	6,	Page 200.
201	Attelabus curculionoides	Nut-tree and willow	6,7,	—— —
202	Apoderus Coryli	Nut-tree	6,7,	—— 201.
203	Rhynchites Bacchus	Nut, plum tree and hop	6,	Marsh. 240. sp. 6.
	æquatus	White-thorn	6,	—— 238. sp. 1.
	cupreus	———	6,	—— 239. sp. 4.
	æneo-virens	——— hedges	6,	—— — sp. 5.
	nanus	White-thorn	6,	—— 238. sp. 3.
	Alliariæ	———	6,	—— — sp. 2.
	pubescens	Nut-tree	6,	—— 240. sp. 7.
	Betulæ	White-thorn hedges & alder	6,	—— 241. sp. 8.
204	Deporäus Betulæ	Oak, birch and hazel	6,7,	Page 201.
205	Apion melanopum	Broom	6,	KirbyTr.L.Soc.ix.
	Malvæ	Mallow	6,	—— ——
	vernale	The white archangel & nettle	6,	—— ——
*	vorax	Ash		—— ——
	cærulescens	White-thorn	6,	—— ——
	sulcifrons	Bush vetch	6,	—— ——
	Malvarum	Mallow	6,	—— ——
*	nigritarse	Nut-tree		—— ——
	flavipes	Trefoil and sandy places	6,7,	—— ——
	Sorbi	Mountain ash		—— ——
	subsulcatum	Bush vetch	6,	—— ——
	flavifemoratum	Trefoil	6,	—— ——
*	Fagi	Beech trees		—— ——
	virens	Hedges		—— ——
*	marchicum	——— ?		—— ——
	Spartii	Broom	6,	—— ——
*	Gyllenhalii	Birch		—— ——
*	Meliloti	Trefoil		—— ——
*	lævigatum	Sandy places		—— ——
	Oxurum	Mallows	6,	—— ——

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
205	Apion æneum	Mallows	6,	KirbyTr.L.Soc.ix.
*	hæmatoides	Grass near furze & sandy pl.	6,	—— ——
	frumentarium	Nettles and sandy places	6,	—— ——
206	Curculio argentatus	Oak	6,	Page 202.
	Mali	Nettles		Marsh.317.sp.230.
	cnides	——		—— 318. sp. 231.
	oblongus	Hedges	6,	—— ——
	unifasciatus	——	6,	—— 316. sp. 226.
	sericeus	——	6,	
208	Rhynchænus austriacus	Nettles and sandy places	6,	—— 302. sp. 184.
	Equiseti	Marsh horse-tail	6,	—— 254. sp. 48.
	ærator	Corn spurrey	6,	—— 266. sp. 87.
	Rumicis	The dock, and sandy places	6,	—— — sp. 85.
	stramineus	Sandy places	6,	—— 267. sp. 88.
	resinosus	——	6,	—— 268. sp. 91.
209	Balaninus Nucum	Nut-tree	6,	Page 203.
	Tremulæ	Aspin	6,	Marsh.291.sp.156.
	Tortrix	——	6,	—— 291. sp. 157.
	maculatus	Sallows	6,	—— 292. sp. 158.
210	Liparus niger	Sandy places near the sea		—— 297. sp. 172.
	scabrosus	Sandy places and nettles	6,	—— 298. sp. 174.
	Vau	——	6,	—— 299. sp. 177.
	raucus	——	6,	—— 300. sp. 179.
	subglobosus	——	6,	—— 313. sp. 219.
	elevatus	Nettles and hedges	6,	—— 306. sp. 197.
	obesus	Hedges, Colney Hatch	6,	—— 304. sp. 191.
	Coryli	Nut-trees	6,	—— 303. sp. 187.
	sulcatus	Sandy places	6,	—— 315. sp. 224.
	Ligustici	—— ? Dover and Surrey		—— 313. sp. 220.
	ovatus	Copenhagen fields&sandy pl.	6,	—— 315.sp.223.
	punctatus	Roots of grass and sandy pl.	6,	—— 291. sp. 155.
	Anglicanus	Chalky and sandy places	6,	—— 290. sp. 154.
211	Cryptorhynchus Lapathi	Osier grounds	6,	—— 254. sp. 47.
	ptinoides	Hedges	6,7,	—— 258. sp. 59.
	phæorhynchus	——	6,7,	—— — sp. 58.
	pleurostigma	——	6,7,	—— 282. sp. 131.
	leucogaster	——	6,7,	—— 253. sp. 45.
	globosus	Sandy places	6,7,	Panz.
	ovalis	Hedges	6,7,	Marsh.279.sp.123.
	dentatus	——	6,7,	—— 280. sp. 125.
	Quercicola	——	6,7,	—— — sp. 126.
	Urticæ	——	6,7,	—— 281. sp. 128.
	melanostictus	——	6,7,	—— 282. sp. 132.
	obstrictus	——	6,7,	—— 255. sp. 50.
	contractus	——	6,7,	—— 250. sp. 36.
	Lythri	——	6,7,	—— 252. sp. 41.
	sulculus	——	6,7,	—— ——
	horridus	——	6,7,	Panz. Faun. Succ.
	viduus	——	6,7,	—— ——

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
211	Cryptorhynchus assimilis	Hedges	6,7,	Marsh. 257.sp.55.
	canescens	———	6,7,	—— 259. sp. 62.
	ruber	———	6,7,	—— 251. sp. 39.
	melanorhynchus	———	6,7,	—— 253. sp. 44.
	inflexus	———	6,7,	—— — sp. 43.
212	Cionus immunis	Sides of ponds	6,	—— 278. sp. 120.
213	Orchestes Alni	Alder	6,	—— 260. sp. 67.
	ferrugineus	Elms	6,	—— — sp. 68.
	atricapillus	Hedges, skirts of woods	6,	—— 261. sp. 71.
	rufus	———	6,	—— — sp. 69.
	nigricollis	Hedges		—— — sp. 70.
	depressus	———, skirts of woods	6,	—— 262. sp. 73.
	pilosus	Hedges	6,	—— — sp. 72.
	rhododactylus	———	6,	—— — sp. 74.
	Salicis	Sallow, skirts of woods	6,	—— 264. sp. 79.
	Avellanæ	Nut-trees	6,	—— 263. sp. 78.
218	Platypus cylindricus ?	Bark of trees, New Forest	6,	Page 205.
220	Hylesinus varius	Bark of trees		Marsh. 54. sp. 9.
221	Cis Boleti	Boletus versicolor		Page 206.
239	Donacia micans	Rushes in ditches	6,	—— 211.
	fasciata	———	6,	Marsh. 344. sp. 9.
	Sagittariæ	———	6,	—— 345. sp. 11.
	vittata	———	6,	—— — sp. 10.
	Nymphææ	———	6,	—— 347. sp. 15.
	fusca	Aquatic pl. in ditches,Greenw.	6,	—— 349. sp. 20.
	palustris	Plants in ditches	6,	—— — sp. 21.
	simplex	Rushes in ditches	6,	—— 348. sp. 19.
	linearis	———	6,	—— 347. sp. 16.
	Hydrocharis	———	6,	—— — sp. 17.
	melanocephala	———	6,	—— 348. sp. 18.
240	Crioceris Asparagi	Asparagus	6,	—— 214. sp. 3.
241	Cassida equestris	Horse-mint in ditches	6,	Page 211.
	similis	———	6,	Marsh. 144. sp. 2.
	cruentata	Thistles		—— 145. sp. 4.
	marcida	Broom		
	nobilis	Oaks and hedges	6,	—— 146. sp. 7.
	splendidula	Nettles and hedges	6,	—— 147. sp. 8.
242	Galeruca Tanaceti	Chalk-pits	6to9,	Page 212.
	Cratægi	White-thorn bushes	6,	Marsh.228. sp.23.
	Caprææ	Aquatic plants	6,	—— 225. sp. 14.
	Nymphææ	———	6,	—— 224. sp. 12.
	calmariensis	———	6,	—— 227. sp. 21.
243	Adimonia nigricornis	Hedges near Bexley	6,	Page 212.
*	Alni	Alder		Marsh. 172. sp. 7.
244	Luperus flavipes	Woods, Shooter's Hill	6,	Page 212.
	rufipes	Willows	6,	Marsh. 217. sp. 9.
245	Haltica oleracea	Birch trees	6,	—— 202. sp. 80.
	orbiculata	Nettles and hedges	6,	—— 200. sp. 72.
	Centaureæ	———	6,	

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
245	Haltica testacea	Nettles and hedges	6,	Marsh. 202. sp. 81.
	aurata	Willows	6,	—— 195. sp. 59.
	nitidula	———	6,	—— — sp. 60.
	Helxines	———	6,	—— 194. sp. 58.
	semiænea	Nettles and hedges	6,	—— — sp. 57.
	cyanea	———	6,	—— 196. sp. 62.
	ruficornis	———	6,	—— 199. sp. 70.
	transversa	———	6,	—— 203. sp. 83.
	affinis	———		
	fuscipes	———		—— 199. sp. 69.
	Hyoscyami	———		—— 193. sp. 55.
	nigricollis	———		—— 206. sp. 91.
	atricilla	———		—— 200. sp. 74.
	nigroænea	———		—— 197. sp. 64.
	picina	———		—— 205. sp. 92.
	concinna	———		—— 196. sp. 61.
	Modeeri	———		—— 194. sp. 56.
	striata	———		
	æneo-fusca	———		
	rufipes	Mallows and hedges	6,	—— 198. sp. 68.
	Pseudacori	Hedges and nettles		—— 196. sp. 63.
	testacea	Hedges	6,	—— 202. sp. 81.
	ærata	White-thorn and nettles		—— 204. sp. 87.
	nodicornis	———	6,	—— — sp. 86.
	Brassicæ	Hedges and gardens	6,	Fabr. Syst. Ent.
	nemorum	Hedges and nettles, Bexley	6,	Marsh. 197. sp. 65.
	flexuosa	———, lanes, Bexley	6,	—— 198. sp. 66.
	4-pustulata	Hedges and nettles, Bexley	6,	—— — sp. 67.
	ochroleuca	Nettles and hedges	6,	—— 202. sp. 80.
	tabida	———	6,	—— 203. sp. 82.
	femoralis	———	6,	—— 201. sp. 76.
	Verbasci	Hedges	6,	—— 202. sp. 78.
	exoleta	Marshy places	6,	—— 201. sp. 75.
	suturalis	Hedges and nettles	6,	—— — sp. 77.
246	Chrysomela quinquejugis	Plants on sea shore, Hants	6,	—— 173. sp. 9.
	Hyperici	Coombe	6,	—— — sp. 8.
	hæmoptera	Sandy pl. near the sea, Hants	6,	—— 171. sp. 5.
	clavicornis	Birch and willows	6,	
	Betulæ	Birch	6,	—— 178. sp. 20.
	Hypochæridis	Hedges	6,	—— 184. sp. 35.
	pallida	———, Coombe		—— 174. sp. 12.
	Populi	Aspen woods	6,	—— 188. sp. 44.
	Tremulæ	———	6,	—— 189. sp. 45.
	Banksii	Nettles, lanes, Bexl. & Crayf.	6,	—— 187. sp. 42.
247	Helodes Phellandrii	Cow parsnip	6,	—— 185. sp. 38.
	violacea	Brook lime	6,	—— 186. sp. 39.
256	Endomychus coccineus	Under bark, Coombe	6,	Page 215.
258	Forficula auricularia	Gardens	6to12	—— 216.
259	Labia minor	Dung-hills, under stones, &c.	6,	—— —

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
262	Acheta campestris	Gardens and fields	6,	Page 218.
267	*Blatta* livida?	Oaks, Chisselhurst, Bexley	6,	Fabr. E. S. ii. 10.
	* ———?	Under stones sea shore		[sp.23.?
272*	Coreus marginatus	Hedges	6,7,	Page 222.
275	Capsus ater	Grassy places	6,	—— —
278	Reduvius personatus	Palings		—— 223.
282	Hydrometra stagnorum	Ponds	4,5,	—— 224.
294	Flata reticulata	Hedges and wood-sides	6,7,	—— 230.
295	Issus coleoptratus	Hedges	6,7,	—— —
296	Cixius nervosus	——— and wood-sides	6,7,	—— —
297*	Asiraca clavicornis	Grassy places?	6,7,	—— —
301	Jassus Lanio	———	6,	—— 231.
	viridis	———	6,7,	Linn.ii. 711.sp.46.
	interruptus	———	6,7,	Stew. ii. 96. sp. 11.
302	Tettigonia viridis	——— and hedges	6,7,	Page 231.
	spumaria	Gardens, on various plants	6,7,	Linn.ii. 708. sp.24.
303	Psylla Alni	Alder	6,	Page 231.
305	Thrips Physapus	Flowers in hedges	6,7,	—— 232.
	Aphis urticata	Nettle	6,	Stewart
307	Eriosoma Mali	Apple-trees	6,	Page 232.
308	Aleyrodes Chelodonii	White-thorn hedges	6,	—— 233.
309	*Coccus* Cacti	Fruit-trees	6,	—— —
311	Papilio Machaon E.	Cowslip mead.? Lymin. Hants	8,	—— 235.
	The Swallow-tail			
314	Pontia Brassicæ M.	Gardens	8,	—— 236.
	The large White			
	Rapæ M.	———	8,	—— —
	The green-veined White			
	Napi M.	———	7,	—— —
	The green-veined White			
	Cratægi *l.*	White-thorn		Haw. 6. sp. 3.
	The black-veined White			
	Cardamines E.	Path-ways in woods		Page 236.
	Sinapis M.	Woods	8,	—— 237.
	The wood White			
315	Melitæa Artemis M.	Meadows		—— —
	The greasy Fritillary			
	Dictynna B.	Heaths and marshes		—— —
	The pearl-bordered Likeness			
	Lucina E.	Pathways in woods, Kent	6,	—— —
	The Duke of Burgundy Fritillary			
316	Argynnis Lathonia E.	Open parts in woods, &c.	9,	—— —
	The Queen of Spain Fritillary			
	Aglaia *l.* M.	Violet		Haw. 31.
	The dark-green Fritillary			
	Adippe *l.* M.	———		—— 32.
	The high-brown Fritillary			
	Paphia *l.* E.	———		—— 30.
	The silver-washed Fritillary			

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
318	Apatura Iris *l.* E. *The purple Emperor*	Great round-leaved willow		Haw. 18.
320	HipparchiaPamphilus *l.* B. *The small Heath*	Crested dog's tail grass	8, ——	17.
	Megæra *l.* B. *The Wall*	Grassy banks	8, ——	22.
	Ægeria *l.* *The speckled Wood*	——	3,6, ——	23.
321	Thecla Rubi E. *The green Hair-streak*	Hedges		Page 241.
322	Lycæna Adonis E. *The Clifden Blue*	Chalky places	8, ——	—
	Dorylas E. *The common Blue*	Heaths and commons	8, ——	242.
	Idas E. *The black-spot Brown*	Clover fields	7, ——	—
	Alsus E. *The Bedford Blue*	Clover fields	7, ——	—
	Argiolus M. *The azure Blue*	Meadows	8, ——	—
	Cymon M. *The Mazarine Blue*	Chalky places	7, ——	—
323	Hesperia Sylvanus E. *The wood Skipper*	Skirts of woods	7, ——	—
	Tages E. *The Dingy Skipper*	Dry heaths and banks	——	—
	Malvæ E. *The mallow Skipper*	Dry banks	——	—
	Paniscus E. *The scarce Skipper*	Open parts in woods, Bedfordsh.	——	243.
324	Smerinthus ocellatus E. *The eyed Hawk Moth*	Near willows	——	—
	Tiliæ M. *The lime Hawk Moth*	Lime and elm trees	——	—
325	Sphinx Porcellus E. *The small Elephant*	Banks of gross weeds	——	—
328	Ægeria apiformis *l.* *The Hornet*	Trunks of lime and poplar tr.		Haw. 68.
331	Hepialus fuscus E. *The brown Swift*	Grassy places	——	141. sp. 4.
	obliquus E. *The silver Swift*	Meadows	——	142. sp. 6.
	nebulosus E. *The spotted silver Swift*	——	——	143. sp. 7.
334	Saturnia Pavonia-minor M. *The Emperor*	Osier beds	8,	Page 246.
	Pavonia-minor *l.* *The Emperor*	Sallows in woods		Haw. 78. sp. 1.

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
336	Laria fascelina *l.* E.	Broom		Haw. 102. sp. 31.
	The dark Tussock			
337	Gastropacha quercifolia *l.* E.	Sloe bushes		—— 95. sp. 19.
	The lappet Moth			
339	Lasiocampa Trifolii E.	Grassy commons		Page 247.
	The grass Eggar			
	Cratægi *l.* M.	White-thorn		Haw. 105. sp. 37.
	The oak Eggar			
343	Notodonta Ziczac B.	Trunks of trees		—— 99. sp. 26.
	The pebble Prominent			
	Camelinus B.	Oaks in woods	8,	—— 98. sp. 21.
	The coxcomb Prominent			
	palpinus *l.* E.	Poplars and sallows in hedges	6,	—— — sp. 20.
	Pale Prominent			
	Camelinus *l.* M.	Oaks		—— — sp. 21.
	Coxcomb Prominent			
340	Closteva reclusa	Trunks of poplars?		—— 131. sp. 91.
	The small Chocolate-tip			
345	Cerura Vinula	Willows and poplars		Page 248.
	The Puss			
346	Arctia villica *l.*	Groundsel		Haw. 94. sp. 17.
	The cream-spot Tiger			
	Plantaginis *l.* B.	Plantain		—— — sp. 18.
	The wood Tiger			
	mendica M.	Marshy places		Page 248.
	The Muslin			
	Menthrastri B.	Gardens		—— —
	The Ermine			[56.
347	CallimorphaDominula *l*	Hound's-tongue and nettles		Stewart ii. 158. sp.
	The scarlet Tiger			
	Bombyx Coryli *l.* M.	Nut-trees	9,	Haw. 102. sp. 39.
	Nut-tree Tussock			
	cæruleocephala *l.*	White-thorn		—— 105. sp. 39.
	Figure of 8.			
	Cassinia *l.* M.	Oaks		—— 106. sp. 40.
	The Sprawler			
349	Yponomenta Cribella	Thistles	8,	Haw. Prodrom.
354	*Noctua* cytherea	Skirts of woods	8,	—— 161. sp. 6.
	The straw Underwing			
	Verbasci M.	Gardens and pales		—— 167. sp. 20.
	The Mullein			
	exoleta	Gardens	10,	—— 168. sp. 24.
	The large Sword-grass			
	conspicillaris M.	Shady pales		—— 171. sp. 32.
	The silver Cloud			
	megacephala	———		—— 177. sp. 49.
	The poplar Grey			

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No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
	Noctua Rumicis	B.	Lanes		Haw. 178. sp. 50.
	The Knot-grass				
	leporina		Trunks of trees		—— 182. sp. 62.
	The Miller				
	oleracea	E.	Gardens		—— 193. sp. 93.
	The bright-line Brown-eye				
	Pisi	*l.*	Broom		—— — sp. 94.
	The Broom				
	runica		Trunks of trees		—— 200. sp. 113.
	The scarce Marvel du Jour				
	præcox	B.	Skirts of woods		—— 201. sp. 114.
	The Portland Moth				
	ferruginago		Trunks of trees		—— 238. sp. 225.
	The heart Moth				
	renago		———		—— — sp. 226.
	The heart Moth, var.				
	meticulosa		Pales	6,9,	—— 244. sp. 251.
	The angle Shades				
	Gamma		Gardens and fields	9,	—— 256. sp. 6.
	The silver Y.				
	Arbuti	E.	Meadows		—— 265. sp. 33.
	The minute yellow Underwing				
	Geometra pusaria		Hedges	to 8,	—— 290. sp. 51.
	The common white Wave				
	arenosaria		Moist woods	6,	—— 289. sp. 48.
	The sandy Wave				
	striaria		———	6,	—— 289. sp. 49.
	The common Wave				
	rotundaria		———		—— — sp. 50.
	The round winged Wave				
	ferrugaria	E.	Hedges		—— 308. sp. 102.
	The red Twin-spot				
	Salicaria	E.	———		—— 309. sp. 103.
	The striped Twin-spot				
	omicromaria	E.	Woods in Kent	8,	—— 312. sp. 110.
	The Mocha				
	ocellaria	E.	Woods	8,	—— — sp. 111.
	The false Mocha				
	pendularia	E.	Birch-trees in woods	8,	—— 311. sp. 108.
	The birch Mocha				
	punctaria	E.	Open places in woods	8,	—— 312. sp. 112.
	The Maiden's Blush				
	putataria	E.	———		—— 300. sp. 82.
	The little Emerald				
	vernaria	E.	Meadows, Peckham		—— — sp. 81.
	The small Grass Emerald				
	illustraria	E.	Skirts of woods	8,	—— 291. sp. 56.
	The purple Thorn				

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra flos-lactata E.	Shady groves		Haw. 351. sp. 111.
	The cream Wave			
	lactata E.	———		—— — sp. 109.
	The pale cream Wave			
	sublactata E.	———		—— — sp. 110.
	The broad-striped cream Wave			
	sylvata E.	Chalky pl. & woods, Kent		—— 329. sp. 40.
	The waved Carpet			
	costovata	Hedges	6,	—— 334. sp. 54.
	The short-barred Carpet			
	fluctuata	Gardens	6,7,	—— 333. sp. 53.
	The garden Carpet			
	consonaria	Woods		—— 277. sp. 17.
	The brindled Grey			
	punctularia M.	Birch-trees		—— 278. sp. 18.
	The grey Birch			
	dubitata E.	Hedges and gardens	8,	—— 318. sp. 7.
	The Tissue			
	centum-notata E.	Open places in woods	8,	—— 324. sp. 24.
	The common marbled Carpet			
	comma-notata E.	———	8,	—— 325. sp. 26.
	The yellow marbled Carpet			
	perfuscata	Woods?		—— — sp. 25.
	The brown marbled Carpet			
	Rhamnata E.	Hedges near chalk-pits		—— 339. sp. 69.
	The dark Umber			
	testata B.	Thickets and bushes		—— 342, sp. 79.
	The Chevron			
	petrata E.	Fern, Coombe Wood		—— 344. sp. 84.
	The brown Silver Line			
	luteata E.	Open places in woods		—— 352. sp. 15.
	The small Yellow Wave			
	candidulata E.	———		—— — sp. 114.
	The small White Wave			
	bimaculata E.	Shady groves		—— 356. sp. 124.
	The white Pinion Spotted			
	vitalbata E.	Hedges near chalk		—— 340. sp. 72.
	The small waved Umber			
	tersata E.	———		—— 339. sp. 70.
	The Fern			
	maculata E.	Pathways, woods		—— 343. sp. 81.
	The speckled Yellow			
	clathrata E.	Clover fields, Kent	8,	—— 348. sp. 98.
	The latticed Heath			
	prænotata S.	Birch-trees		—— 346. sp. 94.
	The sharp-angled Peacock			
	rufata M.	Broom fields		—— 322. sp. 18.
	The broom Tip			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra elongata	Coombe		Haw. 358. sp. 132.
	The long-winged Pug			
	subfuscata E.	Woods		—— 360. sp. 138.
	The brown-grey Pug			
	insulata E.	——	4,7,	—— 330. sp. 43.
	The insulated Carpet			
	subtristata M.	—— and hedges	8,	—— 332. sp. 50.
	The common Carpet			
	marginata	Bushy places	7,	—— 337. sp. 66.
	The clouded Border			
	Euphorbiata	Shady groves		—— 345. sp. 88.
	The drab Looper			
	notata E.	Birch trees		—— 346. sp. 93.
	The Peacock Moth			
	retata E.	Clover fields, Kent		—— 348. sp. 100.
	The netted Heath			
	trigeminata E.	Hedges, chalky places		—— 354. sp. 119.
	The treble Twin-spot			
	illustraria	Skirts of woods		—— 291. sp. 56.
	The purple Thorn			
	plumbeolata E.	Woods		—— 360. sp. 137.
	The lead-coloured Pug			
	pusillata	Gardens		—— 359. sp. 136.
	The small grey Pug			
362	Herminia vittalis M.	Hedges, Chelsea	6,	—— 367. sp. 5.
	The cream-edged Snout			
	barbalis M.	Pathways in woods	7,	—— 368. sp. 11.
	The common Fan-foot			
363	Platypteryx curvula E.	Birch trees		—— 153. sp. 6.
	The bordered Hooktip			
	lacertinaria E.	——		—— — sp. 5.
	The scolloped Hooktip			
364	Cilex compressa E.	Hedges	8,	—— 110. sp. 46.
	The goose-egg Moth			
365	**Tortrix* urticana	Nettles	6,	—— 460. sp. 210.
	The barred Nettle			
	Fagana *l.*	Oaks	7,	—— 395. sp. 2.
	The small green Silver-lines			
	ruficiliana E.	Meadows, Yorkshire		—— 402. sp. 24.
	The red Fringe			
*	Baumanniana	Shady groves		—— 404. sp. 30.
	The Baumannian			
	Oxyacanthana	Hedges		—— 425. sp. 97.
	The White thorn			
*	corticana E	Open parts in woods		—— 432. sp. 118.
	The marbled Long-cloak			
*	sequana B.	Hedges		—— 446. sp. 166.
	The silver Blotch-back			

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MAY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
365	*Tortrix composana E.	Oaks		Haw. 447. sp. 169.
	The triple-striped Blotch-back			
*	nitida E.	Hedges		—— 448. sp. 171.
	The dark Silver-striped			
	strobilana B.	———		—— — sp. 172.
	The light Silver-striped			
*	pauperana	Fens	6,	—— 469. sp. 242.
	The spotted Drab			
*	egestana	———	6,	—— 470. sp. 243.
	The lesser Drab			
	Botys strigulalis E.	——— ? Yorkshire		—— 387. sp. 34.
	The least Black Arches			
	pupuralis E.	Hedges		—— 388. sp. 37.
	The Crimson and Gold			
	*Crambus sanguinea	Grassy places near chalk	8,	—— 484. sp. 11.
	The buff-edged rosy Veneer			
376	Leptocerus interruptus	Marshy places	to 9,	Fa. E.S. ii. 79. sp. 25.
377	Odontocerus griseus	———	to 9,	
378	Phryganea grandis	Woods	6,	Page 257.
379	Limnephilus rhombicus	Marshy places	to 9,	Fa. E.S. ii. 77. sp. 13.
	nervosus	———	to 9,	
	echinatus	———	to 9,	
	griseus	———	to 9,	—— ii. 78. sp. 14.
	radiatus	———	to 9,	
	striola	———	to 9,	
380	Libellula depressa	———	6,	Lin. S.N. i. 902. sp. 5.
	conspurcata	Devonshire	6,7,	
	4-maculata	Ponds and woods	6,7,8,	—— 901. sp. 1.
465	Vespa Crabro	Trunks of trees	6,7,8,	Page 280.
	vulgaris	Woods and hedges, &c.	6,7,	— — —
	Britannica	———	6,7,	—— —
468	Andrena albicans	Tansy and flowers		Kirby ii. 94. sp. 45.
392	Panorpa communis	Hedges	to 8,	Page 260.
403	Zaræa fasciata	Coombe Wood		—— 263.
412	Allantus viridis	Hedges and woods	6,7,	F.E.S. ii. 113. sp. 33.
468	Andrena helvola	Blossoms of black currant		Kirby ii. 119. sp. 59.
	ovatula	Sandy places		—— 149. sp. 89.
	barbilabris	Flowers		—— 151. sp. 91.
	fuscata M.	———		—— 167. sp. 107.
*	Afzeliella	———		—— 170. sp. 108.
470	Sphecodes gibbus	Flowers on sunny banks	6,	—— 42. sp. 7.
	Geoffrella	———	6,	—— 45. sp. 8.
479	*Megachile circumcincta	Stony banks, Dartford		—— 246. sp. 45.
481	Nomada Goodeniana	Sunny banks		—— 180. sp. 4.
	alternata	———		—— 182. sp. 5.
	Marshamella	Round-rooted crowfoot		—— 188. sp. 10.
	Capreæ	Blos.of great round-leaved willow		—— 193. sp. 13.
	leucophthalma	———		—— 197. sp. 16.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
487	Bombus pratorum	Blossoms of the currant		Kirby ii.360.sp.103
490	Corethra culiciformis	Marshy places	6,	Page 290.
491	Tanypus cinctus	———	6,	—— —
492	Chironomus plumosus	———	6,	—— —
493	Psychoda phalænoides	Moist places	6,	—— —
494	Cecidomyia lutea	———	6,	—— 291.
495	Ctenophora atrata	Marshy places	6,	—— —
496	Pedicia rivosa	Marshes	6,	—— —
497	Tipula oleracea	Meadows	6,	—— —
500	Odontomyia tigrina	Marshes, Battersea, (Dr. L.)	6,	F.E.S.iv.267.sp.16.
	microleon	Moist places	6,	—— iv. 265. sp. 9.
502	Nemotelus uliginosus	Flowers in meadows		Page 292.
503	Oxycera Hydroleon	———		—— —
	trilineata	———		F.E.S.iv.267.sp.19.
521	Acrocera gibbosa	Wimbledon Common		Page 296.
523	Rhingia rostrata	Flowers in gardens	6,7,	—— —
527	Helophilus tenax	Hedges	6,7,8,	—— 297.
533	Milesia pipiens	Flowers in hedges & gardens	6,7,	F.E.S.iv.310.sp.119
536	Myopa dorsalis	Hedges	6,	Page 298.
539	Mocillus cellarius	Wine-vaults		—— 299.
550	Musca Cæsar	Hedges and lanes	6,	Li.S.N.i.989.sp.64.
	Meridiana	Trunks of trees	6,	—— i.989. sp. 63.
561	Melophagus ovinus	Sheep	6,	Page 303.
562*	Nycteribia Hermanni	Horse-shoe bats	6,	—— 304.

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6	Atypus Sulzeri	Darent wood		Page 122.
19	Thomisus citreus	Hedges	7,8,	—— 128.
	lynceus	———	7,8,	—— —
10	Cicindela sylvatica	Sandy pl., Christ-ch. Hants, Cobham, Surrey	7,	—— 144.
	hybrida	Sandy pl. Yarmouth, Swansea	7,	Linn.
	Germanica	Chalky pl. Isle of W. Dartf.	7,	Marsh. 390. sp. 2.
12	Carabus glabratus	Surrey. Ireland, (Dr. Leach)		Tr.Ent.S.i.93.pl.2.
	arvensis	Near Norwich (Mr. Step.) Sur.		——— 93.
13	Calosoma sycophanta	Near Dartmouth		Page 146.
	Inquisitor	W.thorn, Norw. Dev. Windsor		—— —
20	Bembidium bipunctatum	Sand-pits, Darent W.	6,	Marsh. 453. sp. 55.
25	Harpalus tibialis	Sandy places?	7,	—— 445. sp. 33.
	aulicus	Trees, Coombe	6,	—— — sp. 34.
	Germanus	Kingsbridge, Devon	7,	Panzer.
45	Epomis cincta	Fields, Bristol, Plymouth	7,	Page 151.
39	Calathus littoralis	Sea shore		
40	Pœcillus lepidus	Pathways, fields		Gyll ii. 94. sp. 14.
48	Lamprias cyanocephala	Broom? Darent Wood		Page 155.
49	Lebia crux-minor	Under stones	8,	—— —
52	Odacantha melanura	Moist pl. Norfolk, Swansea		—— 156.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
57	Hydroporus dorsalis	Ponds, Copenhagen Fields		Marsh. 421. sp.21.
	melanocephala	Ponds		—— 423. sp. 25.
	flavipes	———, Coombe		Tr. Ent. Soc. i. 90.
60	Colymbetes vitreus	———, Norfolk		Gyl. i. 489. sp. 23.
	fenestratus	Croydon Canal		Marsh. 446. sp.10.
	colconotus	Ponds, Coombe		Gyl. i. 504. sp. 36.
*	oblongus	———, Norfolk		—— i. 494. sp. 27.
61*	Hydaticus Hybneri	———, Ealing		Page 159.
*	stagnalis	———, Wiltshire		Gyll. i. 481. sp. 15.
65	Buprestis biguttatus	Woods		Page 58.
	viridis	Birch and nut-trees		—— 160.
66	Trachys minuta	———	7,	Marsh. 398. sp. 6.
	pygmæa	Birch ? Coombe Wood		—— — sp. 7.
67*	Aphanisticus emarginatus	Woods ? Devon		Page 160.
70	Elater pectinicornis	Woods ? Yorkshire		Marsh. 387. sp.31.
	cupreus	——— ? ——		—— 381. sp. 23.
	ferrugineus	——— ? Kent		—— 382. sp. 19.
	ephippium	——— ? ——		—— 383. sp. 21.
	rufipennis	New Forest		
	sanguineus	Highgate		—— 382. sp. 20.
	pomonæ	Devon		
	præustus	———		Gyll. i. 417. sp. 46.
	metallicus	Bristol		—— i. 392. sp. 19.
	riparius	———		—— i. 402. sp. 31.
	4-pustulatus	Copenhagen Fields		—— i. 424. sp. 54.
	bipustulatus	Windsor		Marsh. 375. sp. 1.
	thoracicus	Hyde Park		—— 376. sp. 3.
	ruficollis	Woods		—— — sp. 2.
	rufipes	———		—— 389. sp. 34.
	cylindricus	Hedges		Gyll. i. 394. sp. 22.
*	longicollis	Bristol		—— i. 412. sp. 41.
	villatus, var.	Hedges		—— i. 410. sp. 39.
71	Dascillus cervinus	Woods and Hedges, Kent		Page 162.
74	Drilus flavescens	Grass, Darent Wood		—— 163.
75	Lycus minutus	Oak and hedges	7,8,9,	—— —
76	Lampyris noctiluca	Hedges, woods and heaths	7,	—— —
79	Dasytes flavipes	Hedges, Coombe and Darent		Gyll. i. 327. sp. 5.
	cæruleus	Thrift, sea-shore, Hants		—— i. 324. sp. 1.
	viridis	——— Devon		
80	Malachius ruficollis	Grass and hedges	7,	Marsh. 371. sp.12.
	sanguinolentus	———	7,	—— 370. sp. 10.
	fasciatus	———, Darent and Coombe	7,	—— 371. sp. 11.
81	Tillus elongatus	Oaks, Hants, (Mr. Chant)		Page 165.
*	unifasciatus	Oaks ?		—— —
82	Thanasimus formicarius	Sandy banks, Coombe		—— —
83	Opilus mollis	Hedges and woods	7,	—— 166.
88	Silpha reticulata	Corn-fields	6,	Marsh. 119. sp.11.
*	nitidiuscula	Yorkshire	S.bicolor,	Tr.Ent.Soc.82.
89*	Phosphuga subrotundata	Under stones, Ireland		Zool. Misc. iii. 75.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
96	Cryptophagus pallens	Umbelliferous plants	7,	Marsh. 477. sp. 9.
98	Thymalus ferrugineus	Under bark of trees, New Forest, Hants	7,	Page 170.
99	Nitidula Boleti	Fungi		
	fulva	———		Marsh 136. sp.21.
	obscura	Dead animals		—— 130. sp. 3.
	obsoleta	Fungi		—— 135. sp. 19.
	10-guttata	Under bark, Coombe		—— 135. sp. 20.
	marginata	Dry bones, Coombe		Gyll. i. 216. sp. 3.
	depressa	Dry bon. & un. bark, Coombe		Marsh. 133. sp. 14.
	grisea	——— and under bark of tr.		—— 134. sp. 15.
114	Tachyporus chrysomelinus	Flowers	7,	Gyll. ii. 236. sp. 1.
118	Bythinus Curtisii	Sand-pits, Bexley		Page 178.
124	Ptinus imperialis	Hedges, Birch Wood		Marsh. 88. sp. 24.
127	Anobium castaneum	Hedges near Crayford, Kent		—— 84. sp. 7.
	rufipes	Houses, Coombe Wood		—— 83. sp. 5.
	panicium	Houses		Gyll. i. 293. sp. 5.
	molle	———		Marsh. 84. sp. 8.
	ptinoides	Coombe		—— 228. sp. 5.
128	Dermestes murinus	Darent Wood		—— 61. sp. 2.
129	Attagenus serra	Under bark of trees		—— 63. sp. 7.
132	Throscus dermestoides	Houses, Coombe		Page 183.
135	Onthophilus striatus	Under dung		—— 184.
	sulcatus	———		Hister s. Payk. M. H.
136	Hister 2-maculatus	———		Linn.
	virescens	———		Payk.
	æneus	———		Fabr.
	nitidulus	———		——
158	Odonteus mobilicornis	Wisbeach, Norfolk	7,	Page 189.
162	Synodendron cylindricum	Old ash-trees, Bexley		—— 190.
163*	Melolontha Fullo	Near Sandwich and Dover	7,	Marsh. 36. sp. 64.
	solstitialis	Trees	7,8,	—— 38. sp. 66.
164	Anomala Frischii	Near the sea shore, Devon		—— 40. sp. 71.
	horticola	Skirts of woods		—— 41. sp. 78.
*	Agricola	Glamorgansh. (Mr. Donovan)		—— 43. sp. 76.
*	Donovani	——— ———		—— 44. sp. 77.
	ruricola	Newmarket Heath	7,	—— 39. sp. 68.
165	Hoplia pulverulenta	Heaths	7,	Page 191.
166	Trichius variabilis	Brixton, Surrey		Tr. Ent. Soc. i. 81.
168	Lucanus Cervus	Lanes	7,	Page 192.
169	Blaps lethifera	Cellars, Hertfordshire		Marsh. 479. sp. 2.
172	Tenebrio obscurus	Cellars		Turton ii. 478.
174	Phaleria cadaverina	Sandy places		Page 193.
175	Diaperis Boleti	Boleti of trees	6,	—— 194.
	ahenea	Sandy places, Bexley		Marsh. 176. sp. 17.
176	Tetratoma Fungorum	Fungi in woods	7,	Page 194.
177	Leoides picea	Sandy places	7,	—— —
	humeralis	Fungi, Darent Wood		Marsh. 67. sp. 13.
*	polita	Sandy places ?		—— 75. sp. 45.

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177	Leoides ruficollis	Sandy places, Darent Wood		Marsh. 68. sp. 19.
178	Boletophagus Agaricola	Boleti and fungi		Page 194.
179	Helops lanipes	Under bark of trees? Devon		—— —
180	Cistela ceramboides	Hedges		Marsh. 222. sp. 6.
	sulphurea	Umbelliferous plants	7,	—— 219. sp. 1.
	fulvipes	Hedges		—— 223. sp. 10.
	castanea	Hedges and skirts of woods	7,	—— — sp. 9.
	humeralis	Boleti, Coombe W. (Mr. Stone)		Gyll. ii. 545. sp. 5.
	fusca	Hedges and woods, Darent		Marsh. 223. sp. 8.
182*	Orchesia micans	Boleti		Page 195.
185	Pyrochroa coccinea	Woods, Bexley and Darent		—— 196.
186	Scraptia fusca	Boleti		—— —
188	Anthicus antherinus	Flowers, Hertford		Marsh. 485. sp. 3.
190	Mordella fasciata	Flowers, New Forest		Page 197.
192	Meloë tectus	Woods, Hampstead		Leach Tr.L.S. xi.
193	Cantharis vesicatoria	Ash-trees		Page 198.
194	Œdemera cærulea	Umbelliferous plants	7,	—— —
	nigripes	Chatham	6,	Marsh. 372. sp. 14.
	ruficollis	Bristol	6,	Panz.
	viridissima	Flowers in chalk-pits, Kent		Marsh. 372. sp. 13.
	lurida	———		—— 360. sp. 6.
	Podagrariæ	Umbelliferous plants		Gyll. ii. 633. sp. 6.
195	Mycterus curculionides	Flow. chalk-pits, South Devon		Page 199.
197	Platyrhinus latirostris	Boleti in woods		—— —
	albinus	Hurdles & dry wood, woods, Eltham		Marsh. 295. sp. 166.
	brevirostris	Hedges, Coombe		
199*	Rhinomacer attelaboides	Thistles		Page 200.
200	Bruchus seminarius	Henley		Marsh. 236. sp. 3.
203	Rhynchites Populi	Aspen and poplar	7,	—— 241. sp. 9.
	angustatus	Coombe		
	cylindricus	———	6,	
205	Apion vicinum	Bird's-foot trefoil	7,	Kirby Tr.L.S. ix.
	ruficorne	Nut-tree		—— ——
	assimile	Sulphur-coloured trefoil		—— ——
*	Astragali	Sweet milk-vetch		—— ——
	Loti	Bird's-foot trefoil		—— ——
*	violaceum	The dock	7,	—— ——
*	Hydrolapathi	———	7,	—— ——
	Rumicis	The broad-leaved dock	7,	—— ——
	Carduorum	Thistles	7,	—— ——
206	Curculio Pyri	Skirts of woods		Marsh. 317. sp. 229
208	Rhynchænus Pini	Pine woods		—— 289. sp. 152.
	Abietis	Fir woods, Scotland		
	ebeneus	Hertford, (Mr. Stephens)		—— 270. sp. 100.
	subnebulosus	Norfolk		
	palustris	Battersea		
	interruptus	Banks and sandy places		—— 269. sp. 95.
	Plantaginis	———		—— 265. sp. 84.

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208	Rhynchænus Nereis	Norfolk		Payk.iii.240.sp.58.
	Sysimbrii	Hedges		Marsh. 253. sp.45.
	atrirostris	———		Payk.iii.227.sp.45.
	Alismatis	———		Marsh.273.sp.108
	crassus	———		—— 245. sp. 18.
	brevis	———		—— 265. sp. 82.
209	Balaninus Glandium	———	7,	—— 284. sp. 137.
	Cerasorum	———	7,	—— — sp. 138.
	tenuirostris	Oaks	7,	—— — sp. 139.
	fasciatus	Hedges	7,	—— 286. sp. 144.
	Pomorum	———	7,	—— 285. sp. 142.
	murinus	———	7,	
	longimanus	———	7,	—— 293. sp. 161.
	fructuum	———	7,	—— 292. sp. 159.
	maculatus	Sallows in hedges	7,	—— — sp. 158.
	rubellus	Hedges	7,	—— 293. sp. 162.
	atramentarius	———	7,	—— — sp. 163.
	stygius	———	7,	—— 294. sp. 165.
	semicylindricus	———	7,	—— — sp. 164.
210	Liparus Germanus	Dover and Hastings	7,	—— 290. sp. 153.
	piceus	Sandy places	7,	—— 305. sp. 194.
	maurus	Sandy pl. and nettles,Coombe		—— 316. sp. 225.
	pilosulus	———	7,	—— 299. sp. 175.
	setosus	———		—— 304. sp. 189.
	Ædidii	Coombe		—— 307. sp. 201.
	maritimus	Bristol		—— 307. sp. 202.
	scabriculus	Coombe		—— 304. sp. 192.
	subrotundus	———		—— — sp. 190.
211	CryptorhynchusErysimi	———		—— 257. sp. 56.
312	Cionus Scrophulariæ	Water betony	7,	—— 276. sp. 117.
	Thapsi	——— ?	7,	—— 277. sp. 118.
	Hortulanus	Knotty-rooted figwort? woods Bexley		—— 278. sp. 119.
	bipustulatus	———		—— 278. sp. 121.
216	Hylurgus Piniperda	Bark of the pine		Page 205.
	niger	———		Marsh. 59. sp. 24.
	ater	———		—— — sp. 25.
	obscurus	Bark of trees		—— 57. sp. 17.
217	Tomicus Typographus	———		Page 205.
	fuscus	———		Marsh. 53.sp. 5.
219	Scolytus multistriatus	———		—— 54. sp. 8.
220	Hylesinus crenatus	———		Page 206.
221	Cis concinnus	Boleti		Marsh. 87. sp, 19.
	bidentatus	———		—— 86. sp. 17.
222	Cerylon histeroides	Bark of trees	7,	
	bipunctatum	Under bark of trees	7,	—— 108. sp. 7.
	dermestoides	———	7,	
224*	Mycetophagus 4-pustulatus	Fungi		Page 207.
230	Lamia ædilis	Trunks of trees	7,	Page 209.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
230	Lamia nebulosa	Dry hurdles, fággots, &c.	7,	Page 209.
	Textor	Trunks of willows		—— ——
	aculeata	Trunks of trees		—— ——
	pilosa	Dry wood in hedges, hurdles	7,8,	Marsh. 327. sp. 4.
	hispida	———	7,8,	—— 326. sp. 3.
	scalaris	Willows?		—— 329. sp. 8.
	populnea	Aspen	7,	—— 330. sp. 9.
	nubila	Trunks of trees, Coombe		—— 332. sp. 13.
	præusta	Hedges, Kent	7,	—— 333. sp. 14.
232	Cerambyx moschatus	Willows	7,	Page 209.
233	Clytus Arietis	Trunks of trees	7,	—— 210.
	arcuatús	———		Marsh. 338. sp. 24.
	Alni	Faggots and hurdles in woods		—— 338. sp. 23.
	mysticus	Trunks of tr. & hedges, Kent	7,	—— 337. sp. 22.
234	Callidium violaceum	Palings		Page 210.
	bajulum	———		Marsh. 334. sp. 17.
235	Molorchus major	Flowers in hedges & woods		Page 210.
	dimidiatus	Umbelliferous plants		Marsh. 358. sp. 1.
236	Leptura elongata	Flowers in hedges	7,	Page 210.
	rufiventris	———	7,	Marsh. 341. sp. 2.
	meridiana	Umbelliferous plants	7,	—— 340. sp. 1.
	attenuata	———	7,	—— 354. sp. 32.
	aurulenta	———	7,	—— 356. sp. 34.
	melanura	———	7,	—— 350. sp. 23.
	nigra	———	7,	—— 351. sp. 25.
	sexguttata	——— (Darn.)	7,	—— 357. sp. 37.
	lævis	———	7,	—— 351. sp. 26.
	livida	———	7,	—— 352. sp. 27.
	femorata	———	7,	—— — sp. 28.
	revestita	———	7,	—— 350. sp. 24.
	affinis	———	7,	—— 353. sp. 29.
	sanguinolenta	———	7,	
	collaris	———	7,	—— 349. sp. 22.
	6-maculata	———	7,	—— 353. sp. 30.
237	Rhagium vulgare	———	7,	Page 210.
	bifasciatum	———	7,	Marsh. 342. sp. 4.
238	Hargium Inquisitor	———	7,	Page 210.
239	*Donacia* Zosteri	Aquatic plants, Hull	7,	—— 211.
	Equiseti	———	7,	—— ——
240	Crioceris merdigera	White lily		—— ——
*	12-punctata	Asparagus	7,	Marsh. 214. sp. 2.
	cyanella	Willows	7,8,	—— 215. sp. 4.
	subspinosa	Skirts of woods and elm	7,	—— 216. sp. 7.
	flavicollis	Skirts of woods	7,	—— 217. sp. 8.
242	Galleruca Viburni	Sandy places, Bexley		—— 224. sp. 13.
245	Haltica Mercurialis	Hedges near Darent Wood	7,	
	Erucæ	Henbane	7,	—— 193. sp. 53.
246	Chrysomela Graminis	Newmarket Heath		—— 172. sp. 6.
	fastuosa	Woods, Kent	7,	—— 174. sp. 11.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
246	Chrysomela 10-punctata	Oaks, Bexley	7,	Marsh. 175. sp. 14.
	10-notata	Willows, Bexley	7,	—— — sp. 13.
	Vitellinæ	Willows		—— 180. sp. 23.
	marginata	Heaths, Norfolk		—— 190. sp. 47.
*	lurida	Windsor		
	unicolor	Hedges ?		Marsh. 185. sp. 37.
248	Cryptocephalus sericeus	Dandelion		Page 213.
	similis	Flowers in chalk-pits, Kent		N. S.
	Coryli	Hedges, Darent	7,	Marsh. 208. sp. 4.
	lineola	Wood-sides, Kent		—— 207. sp. 3.
	nitens	Hedges		—— 209. sp. 7.
	6-punctatus	Sallows in moist woods, Kent		—— 208. sp. 5.
	Moræi	New Forest		—— 212. sp. 14.
	marginellus	Hedges		—— 211. sp. 10.
	pusillus	———, Coombe		—— 210. sp. 9.
	bilituratus	Bristol		
*	labiatus	Hedges ?		—— 211. sp. 11.
	flavilabris	———, Kent		Kirby MS.
249	Clytra 4-punctata	Oak, Bexley		Marsh. 207. sp. 2.
	tridentata	Sallows, Coombe Wood		—— 206. sp. 1.
251	Triplax bicolor	Coombe		—— 122. sp. 18.
253	Agathidium nigripenne	Sandy places	7,	Page 215.
	rufipenne	———	7,	Gyll. ii. 565. sp. 8.
	nanum	———	7,	
254	Coccinella 14-guttata	Hedges		Illig. 435. sp. 22.
	bis-6-guttata	Windsor		—— 432. sp. 19.
	ocellata	Windsor and Norwich		—— 437. sp. 25.
	5-punctata	Hedges and Battersea fields	9,	—— 441. sp. 28.
	22-punctata	Hedges	3,9,	—— 468. sp. 37.
	conglomerata	Meadows	7,8,9,	Payk. ii. 28. sp. 30.
	14-pustulata	Windsor		Illig. 445. sp. 30.
	lateralis	Devon		
	impustulata	Coombe and Norfolk		—— 459. sp. 34.
	conglobata	Cobham, Surrey		—— 462. sp. 35.
	11-punctata	Coombe		——
	hieroglyphica	———		—— 445. sp. 31.
	18-guttata	Firs		—— 431. sp. 18.
255	Chilocorus 4-verrucatus	White-thorn		—— 473. sp. 41.
	bipustulatus	Oak	9,	—— 475. sp. 43.
260	Labidura gigantea	Und. sto. sea-sh. Christ-ch. Hants		Page 217.
	Scymnus litura	Hedges	7,8,9,	Illig. 419. sp. 10.
	discoideus	———	7,8,9,	—— 418. sp. 9.
	nigrinus	———	7,8,9,	—— 413. sp. 1.
	fulvifrons	———	7,8,9,	Marsh. 168. sp. 48.
	parvulus	———	7,8,9,	Illig. 414. sp. 4.
	analis	———	7,8,9,	Payk. ii. 7. sp. 3.
	bipustulatus	———	7,8,9,	Marsh. 164. sp. 37.
	bis-bipustulatus	———	7,8,9,	Illig. 415. sp. 6.
	4-pustulatus	———	7,8,9,	Marsh. 164. sp. 38.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Sphærosoma Quercus	Oaks	7,	
268	Tetyra Maura	Hedges		Page 220.
	inuncta	Sandy places, Bexley		Stew. ii. 103.
272	Coreus rhomboideus	Hedges		
	hirticornis	Sandy places		
273	Berytus tipularius	Grassy places		Page 222.
274	Lygæus nugax	Hedges in woods	7,	
	Hyoscyami	Stony places, Devon		Stew. ii. 105.
	micropterus	Grassy places, Coombe		Trans. Ent. Soc. 73.
275	Capsus spissicornis	Woody places		Stew. ii. 104.
	ruficollis	Sandy places		
276	Miris vagans	Hedges		Page 222.
277	Myodocha tipuloides	———		—— 223.
279*	Ploiaria vagabunda	——— ?		Stew. ii. 107.
280	Cimex lectularius	Houses		Page 223.
281	Tingis Cardui	Thistles		—— ——
293	Cicada *Anglica ?*	Pennington Common ? Hants		—— 229.
298	Cercopis sanguinolenta	Open places in woods, Kent	7,	—— 231.
299	Ledra aurita	Hedges and oaks	7,	—— ——
300	Membracis cornutus	Hedges and woods	7,	—— ——
304	Livia Juncorum	Junci	7,	—— 232.
	Aphis Ribis	Red currant	7,8,	Stewart.
	Ulmi	Elm	7,8,	———
	Pruni	Plum-trees	7,8,	———
	Sambuci	Elder	7,8,	———
	Pruni cerasi	Cherry-tree	7,8,	———
	Rumicis lapathi	The dock	7,8,	———
	Acetosæ	Wild sorrel	7,8,	———
	Ligustici scotici	Lovage	7,8,	———
	Lychnidis	Lychnis dioica	7,8,	———
	Capreæ	Willow	7,8,	———
	Padi	Bird-cherry	7,8,	———
	Rosæ	Rose	7,8,	———
	Dauci	Carrot	7,8,	———
	Tiliæ	Lime-trees	7,8,	———
	Juniperi	Juniper	7,	———
	Brassicæ	Cabbage	7,	———
	Craccæ	Vicia cracca	7,	———
	Lactucæ	Lettuce	7,	———
	Sonchi	Sow-thistle	7,	———
	Tanaceti	Tansy	7,	———
	Absinthii	Wormwood	7,	———
	Millefolii	Milfoil	7,	———
	Avenæ sativæ	Oats	7,	———
	Fraxini	Ash-tree	7,	———
	Jaceæ	Centaurea jacea	7,	———
	Betulæ	Birch-tree	7,	———
	Alni	Alder	7,	———
	Fagi	Beech-tree	7,	———

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	Aphis Quercus	Oak	7,	Stewart.
	Pini	Scotch fir	7,	——
	Salicis	Willow	7,	——
	Populi	The leaves of the aspen	7,	——
	Tremulæ	Young branches of the aspen	7,	——
	Viburni	Way-faring tree	7,	——
	Bursaria	Black poplar	7,	——
	Aceris platanoides	Maple	7,	——
	Atriplicis	Orach	7,	——
	Plantaginis	Plantain	7,	——
	Leucanthemi	Ox-eye daisy	7,	——
	Scabiosæ	Scabious	7,	——
	Fabæ	Bean	7,	——
	Coccus Quercus	Oak	7,	——
	Betulæ	Birch	7,	——
	Carpini	Hornbeam	7,	——
	Ulmi	Elm	7,	——
	Coryli	Hazel	7,	——
	Tiliæ	Lime	7,	——
	Capreæ	Willow	7,	——
	Salicis	Salix hermaphrodita	7,	——
	polonichus	Scleranthus perennis	7,	——
	Fragariæ	Strawberry	7,	——
	Pilosellæ	Hieracium Pilosella	7,	——
	Uva ursi	Arbutus uva ursi	7,	——
	Phalaridis	Canary grass	7,	——
	Oxyacanthæ	White-thorn	7,	——
	Serratulæ	Serratula arvensis	7,	——
	Persicæ	Peach-trees	7,	——
	Abietis	Pinus Abies	7,	——
	Mespili	Medlar	7,	——
	Aceris	Maple	7,	——
	Alni	Alder	7,	——
	fuscus	Oak	7,	——
	variegatus	——	7,	——
	conchiformis	Elm	7,	——
	catafractus	Mosses	7,	——
305	Thrips minutissima	Flowers, frequent in carnation	7,8,	——
	juniperina	Galls of the juniper	7,8,	——
	fasciata	Compound flowers	7,8,	——
310	Pulex Talpæ	The mole (Mr. Weatherhead)		N. S.
	Hirundinis	Swallows (Mr. Stephens)	7,	——
	Sciurus?	Squirrel		——
312	Gonepteryx Rhamni *The Brimstone*	Woods	7,8,	Page 236.
313	Colias Hyale *The clouded Yellow*	——	8,	—— —
314	Pontia Cratægi *The black-veined White*	Gardens and woods		—— —

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
315	Melitæa Euphrosyne B.	Waste grounds and heaths		Page 237.
	The pearl-bordered Fritillary			
	Cinxia M.	Meadows		—— —
	The Granville Fritillary			
317	Vanessa Polychloros *l.* E.	Elms		Haw. 27.
	The large Tortoiseshell			
	Urticæ *l.* B.	Nettles		—— 26.
	The small Tortoiseshell			
	Urticæ B.	Lanes, &c.	9,	Page 238.
	The small Tortoiseshell			
	C. album *l.* M.	Nettle, hop, willow & currant	8,	—— —
	The white C.			
319	Limenitis Camilla *l.*	Honeysuckle		Haw. 34.
	The white Admiral			
320	Hipparchia Hyperanthus E.	Woods and fields		Page 240.
	The Ringlet			
	Pamphilus B.	Grassy Commons	9,	—— —
	The small Heath			
*	Blandina	Isles of Bute and Arran	6,	—— —
	The Scotch Argus			
	Pilosella *l.* B.	Mouse-earHawkweed, pastures		Haw. 25.
	The large Heath			
	Janira B.	Meadows		Page 240.
	The meadow Brown			
	Ægeria *l.*	Grassy banks	3,5,	Haw. 23.
	The speckled Wood			
	Davus	Marshes		—- 15. sp. 16.
	The small Ringlet			
	Polydama	——		—— 16. sp. 17.
	The marsh Ringlet			
	Typhon	——		—— — sp. 18.
	The scarce Heath			
	Ægeria E.	Borders of woods and fields	4,8,	Page 241.
	The speckled Wood			
321	Thecla Betulæ *l.* E.	Birch		Haw. 37.
	The brown Hairstreak			
	Quercus *l.* B.	Oak		—— 39.
	The purple Hairstreak			
322	Lycæna Phlæas B.	Grassy commons	4,8,	Page 241.
	The common Copper			
	Idas *l.* E.	Grassy banks	4,	Haw. 46.
	The black-spot Brown			
324	Smerinthus Populi E.	Trunks of poplars		—— 243.
	The poplar Hawk			
325	Sphinx Elpenor E.	Gardens and marshy places		—— —
	The elephant Hawkmoth			
	lineata	Gardens		—— —
	The silver-line Hawkmoth			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
325	Sphinx Galii E.	Devonshire		Page 244.
	The scarce Elephant			
	Euphorbiæ B.	———		—— —
	The spotted Elephant			
	Pinastri	Trunks of pine-trees		—— —
	The pine Hawk Moth			
	Ligustri E.	Gardens		—— —
	The privet Hawk			
326	MacroglossaStellatarum *l.* E.	Bedstraw		Haw. 66.
	The Humming-bird			
	Stellatarum E.	Gardens	4,9,	Page 244.
	The Humming-bird			
327	Sesia bombyciformis M.	Flowers, marshy pl. in woods		—— —
	The narrow-bordered Bee			
	fusciformis M.	Borders of woods		—— —
	The broad-bordered Bee			
328	Ægeria apiformis E.	Near lime and poplar trees		—— 245.
	The Hornet			
	Ægeria Asiliformis M.	Poplars		Haw. 69. sp. 19.
	The clear Underwing			
	Cynipiformis M.	Gardens		—— — sp. 20.
	The yellow-legged Clearwing			
	Tipuliformis M.	Currant-bushes		—— 70. sp. 21.
	The currant Clearwing			
	Oestriformis M.	Gardens and woods		—— — sp. 22.
	The yellow-tailed Clearwing			
	Vespiformis E.	Devonshire		—— — sp. 23.
	The six-belted Clearwing			
	Spheciformis	Enfield?		—— 71. sp. 25.
	The black and white-bordered Clearwing			
329	Zygæna Filipendulæ B.	Meadows		Page 245.
	The six-spotted Burnet			
	Loti E.	———		Haw. 74. sp. 3.
	The five-spotted Burnet			
330	Ino Statices M.	———		Page 245.
	The Forester			
331	Hepialus Humuli M.	Grassy places		—— —
	The Ghost			
	Mappa	Darent Wood, (Mr. Standish)		Haw. 141. sp. 3.
	The beautiful Swift			
	Angulum B.	Open places in woods		—— 142. sp. 5.
	The tawny Swift			
	hectus M.	———		—— 144. sp. 8.
	The gold Swift			
332	Cossus Ligniperda E.	Trunks of willows		Page 246.
	The goat Moth			
335	*Liparis* Monacha *l.* E.	Trunks of oaks		Haw. 87. sp. 11.
	The black Arches			
	Monacha E.	———	8,	Page 246.
	The black Arches			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
336	Laria pudibunda E. *The pale Tussock*	Woods		Page 247.
338	Odenesis potatoria *l.* M. *The Drinker*	†Tall grass in hedges		Haw. 84. sp. 8.
339	Lasiocampa Quercus *l.* *The large Eggar*	†Oak, long grass, white thorn		—— 81. sp. 5.
	Rubi B. *The Fox*	Woods		—— 83. sp. 7.
	Neustria *l.* *The barr'd tree Lackey*	Fruit-trees		—— 129. sp. 87.
340	Eriogaster lanestris *l.* E. *The small Eggar*	†Sloe bushes		—— 124. sp. 84.
341	Endromis versicolor *l.* M. *The Kentish Glory*	†Birch		—— 80. sp. 3.
342	Stauropus Fagi M. *The lobster Moth*	Trunks of trees		Page 247.
343	Notodonta palpinus B. *The pale Prominent*	Willows in hedges	9,	Haw. 98. sp. 20.
	perfuscus *The dark Prominent*	Oaks		—— 100. sp. 27.
	dromedarulus *The small iron Prominent*	Oaks?		—— 101. sp. 29.
	Trepida B. *The swallow Prominent*	Poplars		DonovanB.I.239.1.
344	Pygæra bucephala M. *The buff Tip*	Skirts of woods		Page 247.
345	Cerura minax?	Trunks of apple-trees		
*	bifida	Darent Wood		
346	Arctia villica B. *The cream-spot Tyger*	Open paths in woods		—— 248.
	Caja *l.* *The garden Tyger*	Nettles, &c.		Haw. 93. sp. 16.
	Plantaginis B. *The wood Tyger*	Open places in woods		Page 248.
	Russula M. *The clouded Buff*	Furze on commons		—— —
	papyritia M. *The water Ermine*	Marshy places		—— —
	lubricipeda *The buff Ermine*	Gardens		—— 245.
	Salicis *l.* *The Satin*	Poplars		Haw. 107. sp. 42.
	chrysorrhœa *l.* *The Yellow-tail*	White-thorn hedges		—— 108. sp. 43.
	phæorrhœa *l.* *The Brown-tail*	White-thorn		—— 109. sp. 45.
347	Callimorpha Dominula *The scarlet Tyger*	Lanes		Page 248.

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No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
	Callimorpha rosea		Oaks		Page 248.
	The red Arches				
	Jacobeæ	E.	Heaths and commons		—— —
	The Cinnabar				
	fuliginosa		Skirts of woods		Stew. 159. sp. 57.
	The ruby Tyger				
348	Lithosia quadra	B.	Pine-trees		Page 249.
	The four-spotted Footman				
	Lithosia aurantia		Skirts of woods		Haw. 147. sp. 5.
	The orange Footman				
	Bombyx Dodonæa	M.	Oaks		—— 104. sp. 34.
	Marbled Brown				
	Roboris		Woods		—— — sp. 35.
	Lunar marbled Brown				
	Quercea		Oaks		—— — sp. 36.
	Dark marbled Brown				
	Nudaria fusca		Pales, Winchmore-hill Wood		—— 157. sp. 3.
	The brown Muslin				
349	Yponomenta Evonymella		Hedges	8,	—— 512. sp. 1.
*	Echiella		Dover	6,	
	irrorella		Coombe		—— — sp. 2.
	Padella		Hedges		
350	Æcophora Flavella		Pales		
353	*Adela* Degeerella		Thick woods		
354	*Noctua* Scrophulariæ	*l.*	Water betony		—— 167.
	The water Betony				
	tetra		Gardens	4,	—— 162.
	The Mahogany				
	Pronuba		——	7,	—— 160.
	The large yellow Underwing				
	fimbria	B.	Oaks	8,	—— 161.
	The Broad Border				
	interjecta		Open parts in woods		—— 162.
	The least Broad Border				
	Myrtilli	M.	Heaths near Erith	7,	—— —
	The beautiful yellow Underwing				
	albirena		Heaths, Norfolk		—— 163.
	The small yellow Underwing				
	combusta	E.	Trunks of trees		—— 170.
	The dark Tawny				
	Pinastri	M.	Trunks of pines & shady pales		—— 172.
	The Bird-wing				
	putris	M.	Weedy banks and gardens		—— —
	The Flame				
	crassicornis		Marshy places ?		—— 173.
	The large Wainscot				
	comma	B.	Lanes, Hampsh. (Mr. Bentley)		—— 174.
	The shoulder-stripe Wainscot				

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No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
	Noctua atomina	M.	Marshy places		Haw. 175.
	The powdered Wainscot				
	Aceris	E.	Shady pales		—— 176.
	The Sycamore				
	infuscata	E.	——		—— 177.
	The Sycamore, var.				
	Euphorbiæ		Woods		—— 178.
	The Spurge				
	Ligustri	E.	Trunks of trees		—— —
	The Coronet				
	coronula	E.	——		—— 179.
	The Coronet, var.				
	compta	E.	Pales		—— —
	The marbled Coronet				
	Alni	M.	Trunks of alders		—— 180.
	The Alder				
	Menyanthidis	B.	Trunks of trees		—— —
	The light Knot-grass				
	similis	B.	——		—— —
	The scarce Knot-grass				
	auricoma	M.	Coombe	6,	—— —
	The scarce Dagger				
	Psi	E.	Shady pales		—— 181.
	The dark Dagger				
	tridens	E.	——		—— —
	The light Dagger				
	serena	M.	——		—— 184.
	The broad-barred White				
	grandis	E.	Trunks of trees		—— 185.
	The grey Arches				
	polyodon	E.	Pales and gardens		—— 186.
	The dark Arches				
*	satura		Trunks of trees ?		—— 187.
	The barred Arches				
	advena	B.	Gardens		—— —
	The pale shining Brown				
	rectilinea	M.	Skirts of woods		—— 189.
	The light Brocade				
	dives	M.	Trunks of trees		—— —
	The beautiful Brocade				
	duplex	M.	——		—— 190
	The dark Brocade				
	Achates (*Hub.*)		——		—— —
	The pale shouldered Brocade				
	Brassicæ		Pales	7,8,	—— 191.
	The cabbage Moth				
	Persicariæ	E.	——		—— —
	The Dot				

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JUNE.

No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
	Noctua nigra		Pales? Devon		Haw. 192.
	The black Rustic				
	Chenopodii		Gardens	——	——
	The Nutmeg				
	contigua		——— and pales	——	——
	The large Nutmeg				
	Pisi	M.	Commons and pales	——	193.
	The Broom				
	basilinea	B.	Woods	——	194.
	The rustic Shoulder-knot				
	typica	E.	Weedy banks	——	——
	The Gothic				
	capsincola	B.	——— and gardens	——	196.
	The Lychnis				
	Atriplicis	E.	Gardens and hedges	9, ——	197.
	The Arrach Moth				
	glauca	E.	Shady pales	——	——
	The glaucous Sheers				
	plebeia	E.	———	——	198.
	The glaucous Sheers, var.				
	dentina	E.	———	——	——
	The glaucous Sheers, var.				
	leucostigma	E.	——— near Coombe Wood	——	——
	The pale Sheers				
	ochracea	E.	———	——	199.
	The tawny Sheers				
	Oxyacanthæ	*l.*	White-thorn	——	201.
	The green-brindled Crescent				
	ridens	*l.* E.	Oaks	——	202.
	The frosted Green				
	Lichenis	E.	Old walls, Chelsea	——	203.
	The marbled Green				
	denticulata	B.	Clover-fields	——	205.
	The light-feathered Rustic				
	cubicularis	M.	Willows and gardens	——	208.
	The pale mottled Willow				
	lucipara	E.	Skirts of woods	——	210.
	The small Angle-shade				
	secalina	E.	Marshy places	——	——
	The small clouded Brindle				
	scripta		Woods	——	213.
	The minor Shoulder-knot				
	æthiops	E.	Hedges	——	215.
	The Blackamoor				
	spinifera	E.	Weedy banks	——	217.
	The small Sword-grass				
	suffusa		———	——	——
	The small Sword-grass, var.				

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JUNE.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Noctua connexa	Gardens		Haw. 218.
	The chain-shot Dart			
	venosa M.	Weedy banks		— —
	The broad-veined Dart			
	spinula M.	Hedges		— —
	The brindled Dart			
	nigricornuta M.	Skirts of woods		— 219.
	The black Dart			
	subatrata M.	Weedy banks		— —
	The dark Dart			
	pectinata E.	———		— —
	The pectinated Dart			
	catænata M.	———		— —
	The brindled Heart and Club			
	clavigera E.	———		— —
	The Heart and Club			
	subfusca E.	———		— —
	The brown Heart and Club			
	exclamationis E.	———		— —
	The Heart and Dart			
	C nigrum B.	———		— 226.
	The setaceous Hebrew Character			
	plecta E.	———		— —
	The flame Shoulder			
	ochraceago *l.*	Burdock		— 234.
	The frosted Orange			
	centrago M.	Marshes		— 236.
	The centre-barred Sallow			
	croceago E.	Hedges	2,4,	— 238.
	The orange Upperwing			
	meticulosa	Pales	5,9,	— 244.
	The angle Shades			
	batis M.	Skirts of woods	7,	— 245.
	The Peach-blossom			
	Delphinii	Gardens, Windsor	7,	— 248.
	The Pease-blossom			
	trilinea E.	Thickets	9,	— 249.
	The equal Treble-lines			
	bilinea E.	Coombe		— —
	The dark Treble-lines			
	retusa *l.* E.	Great round-leaved willow		— 251.
	The double Kidney			
	diluta	Trunks of trees		— 252.
	The lesser Lutestring			
	flavicornis B.	Trunks of poplars		— —
	The Poplar Lutestring			
	fluctuosa M.	Skirts of woods		— —
	The satin Carpet			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Noctua duplaris B.	Skirts of woods		Haw. 253.
	The lesser satin Carpet chrysitis E.	Weedy banks		—— 254. sp. 2.
	The burnished Brass orichalcea	Gardens, Crayford		—— — sp. 3.
	The scarce burnished Brass bractea	Yorkshire and Scotland		—— 255. sp. 4.
	The gold Spangle Iota E.	Gardens		—— 256. sp. 5.
	The gold Y. interrogationis	Mountains and heaths, Yorks.		—— 257. sp. 7.
	The Yorkshire Y. circumflexa	Essex		—— — sp. 8.
	The Essex Y. illustris	Salisbury plain		—— 258. sp. 9.
*	*The purple Shades* arcuosa E.	Meadows		—— 260. sp. 17.
	The small-dotted Buff fusca E.	Woods		—— 261. sp. 18.
	The marbled White-spot *albilinea*	——		—— — sp. 19.
	The marbled White-line unca	Marshy places, Norfolk		—— 263. sp. 23.
	The Silver-hook sulphurea E.	Clover-fields		—— — sp. 24.
	The spotted Sulphur luctuosa	——		—— 264. sp. 29.
	The Four-spotted glyphica B.	——		—— 265. sp. 31.
	The Burnet Mi B.	——		—— — sp. 32.
	The Shipton maura	Out-houses and palings	7,8,	—— 269. sp. 6.
360	*The great Brown Bar* Biston Betularius M.	Pales		—— 272. sp. 2.
	The Peppered *Geometra* Prunaria E.	Shady groves		—— 283. sp. 34.
	The orange Moth Roboraria E.	Trunks of trees		—— 275. sp. 8.
	The great Oak Beauty consortaria B.	Woods		—— — sp. 9.
	The pale Oak Beauty repandaria E.	——		—— — sp. 10.
	The mottled Beauty consobrinaria	——		—— 276. sp. 13.
	The tawny Beauty suberaria B.	Open parts in woods		—— 284. sp. 35.
	The large-waved Umber dolabraria E.	Bushes		—— 295. sp. 67.
	The scorched Wing			

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No. Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra Pinaria	Pines, Scotland		Haw. 278. sp. 21.
	The bordered White unidentaria B.	Skirts of woods	8, ——	308. sp. 101.
	The dark red Twin-spot viridaria E.	Open parts in woods	——	304. sp. 92.
	The green Carpet orbicularia M.	Near Brockenhurst, Hants,		
	The dingy Mocha	(Mr. Bentley)	——	311. sp. 109.
	linearia	Woods, Kent	——	314. sp. 114.
	The clay Triple-line respersaria	Heaths	——	289. sp. 46.
	The lesser Grass-wave plumbaria E.	——	——	287. sp. 41.
	The Belle Chenopodaria E.	Bushy places	——	302. sp. 88.
	The small Mallow fasciaria	Westerham, Kent	——	301. sp. 83.
	The barred Red lunaria M.	Paths in woods	——	292. sp. 57.
	The lunar Thorn advenaria M.	Colney-hatch Wood	——	296. sp. 69.
	The little Thorn bidentaria B.	Skirts of woods	4, ——	291. sp. 55.
	The scalloped Hazel pulveraria B.	Paths in woods	——	301. sp. 85.
	The barred Umber Thymiaria E.	Open places, skirts of woods	——	300. sp. 80.
	Common Emerald implicaria	Open places in woods	——	303. sp. 90.
	The silver Ground Vauaria	Gardens	7, ——	283. sp. 33.
	The V *Moth* fuliginaria M.	——	——	281. sp. 30.
	The waved Black trepidaria E.	Mountains, Scotland	——	— sp. 31.
	The black mountain Moth ulmata M.	Elms	——	317. sp. 3.
	The scarce Magpie dealbata B.	Chalky places	——	— sp. 5.
	The Black-veined hastata B.	Open places, Coombe Wood	——	336. sp. 62.
	The Argent and Sable albicillata E.	Paths in woods	——	337. sp. 64.
	The beautiful Carpet adustata E.	Hedges	8, ——	— sp. 65.
	The scorched Carpet rubiginata E.	Pathways, woods	——	338. sp. 67.
	The blue-bordered Carpet			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra ocellata B.	Open paths in woods		Haw. 331. sp. 46.
	The purple bar			
	Galiata	Devonshire	6, ——	332. sp. 47.
	Galium Carpet			
	unilobata	Yorkshire	6, ——	331. sp. 44.
	The blunt-angled Carpet			
	impluviata	Skirts of woods	——	321. sp. 17.
	The May Highflyer			
	berberata	Hedges, Norfolk		Fab. E. S. iv. 182. sp. 189
	derivata B.	Woods		Haw. 326. sp. 30.
	The Streamer			
	spinaciata E.	Gardens	——	341. sp. 76.
	The Spinach			
	Pyraliata	Hedges		Trans. Ent. Soc.
	bilineata E.	Hedges and skirts of woods		Haw. 343. sp. 82.
	The yellow Shell			
	munitata B.	Pine-trees	——	328. sp. 34.
	The rufous Carpet			
	duplicata	Chalky places	——	318. sp. 8.
	The slender Treble-bar			
	nassata M.	Open parts in woods	——	335. sp. 60.
	The small Rivulet			
	rivulata E.	Copenhagen F. and Norfolk	7, ——	— sp. 59.
	The middle Rivulet			
	Alchemillata M.	Bushy places and thickets	——	— sp. 58.
	The Rivulet			
	osseata E.	Hedges	——	353. sp. 116.
	The dwarf Cream-wave			
	lividata B.	——	——	— sp. 118.
	The small dotted Wave			
	punctata	Chalky hedges	6,	
	lineolata	Chalky pl. near Lewes, Suss.	6, ——	341. sp. 75.
	The Oblique-striped			
	heparata M.	Shady groves	——	343. sp. 83.
	The dingy Shell			
	abbreviata	Woods		Hübner.
	venosata E.	Gardens		Haw. 357. sp. 127.
	The netted Pug			
	Centaureata E.	——	——	358. sp. 131.
	The Lime-speck			
	Absinthiata E.	——	——	359. sp. 133.
	The wormwood Pug			
	vulgata	——	7, ——	— sp. 134.
	The common Pug			
	simpliciata	——	——	— sp. 135.
	The plain Pug			
	favillaciaria B.	Near Ringw. Hants, (Mr. Bentley)	——	278. sp. 19.
	The grey Scallop			
	Atomaria B.	Heaths	——	280. sp. 26.
	The common Heath			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra glarearia B. *The yellow Heath*	Heaths		Haw. 280. sp. 27.
	roseidaria B. *The light Heath*	———		—— — sp. 28.
	carbonaria M. *The black Heath*	———		—— 281. sp. 29.
	inæquaria B. *The larger Grass-wave*	Open parts in woods		—— 288. sp. 45.
	Cratægaria B. *The Brimstone*	Hedges and woods	4,8,	—— 298. sp. 74.
	undulata E. *The Scollop-shell*	Pathways, woods		—— 320. sp. 13.
	vetulata E. *The brown Scollop*	Chalky places in woods		—— — sp. 14.
	biangulata *The cloaked Carpet*	Pathways, woods		—— 326. sp. 31.
	ruptata *The broken-barred Carpet*	———		—— 327. sp. 32.
	decolorata *The sandy Carpet*	———		—— 328. sp. 36.
	Chærophyllata B. *The looping Chimney-sweeper*	Open places in woods		—— 344. sp. 85.
	hexapterata B. *The Seraphim*	Birch-trees, Kent		—— 356. sp. 125.
	illustraria *The purple Thorn*	Skirts of woods	5,	—— 291. sp. 56.
	trimaculata B. *The mottled Pug*	Hedges		—— 362. sp. 147.
	singulariata *The grey Pug*	Open parts in woods		—— 360. sp. 139.
	rectangulata M. *The green Pug*	Gardens		—— 363. sp. 151.
	linariata B. *The beautiful Pug*	Open parts in woods		—— 364. sp. 153.
	rusticata *The least Carpet*	Thick woods		—— — sp. 154.
362	Herminea flamealis E. *The rosy Flounced*	Broom-fields, CoombeWood		—— 375. sp. 26.
	vittalis E. *The cream-edge Snout*	Hedges, Chelsea	5,	—— 366. sp. 5.
	proboscidalis E. *The Snout*	Hedges		—— 365. sp. 1.
	rostralis E. *The buttoned Snout*	———		—— 366. sp. 4.
	crassalis *The pinion Snout*	———		—— — sp. 3.
	achatalis B. *The beautiful Snout*	Shady groves, Kent		—— 367. sp. 6.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
362	Herminia salicalis B.	Birch-trees, woods		Haw. 370. sp. 16.
	The lesser Belle			
	derivialis	Skirts of woods, Kent		—— 369. sp. 12.
	The clay Fan-foot			
	tarsicrinalis	Woods		—— — sp. 14.
	The Fanfoot			
	nemoralis	Open parts in woods		—— 370. sp. 15.
	The small Fanfoot			
	obscuralis	Darent Wood		—— 367. sp. 7.
	The dingy Snout			
	colonalis B.	Gardens		—— 374. sp. 21.
	The green Shaded			
	socia	Darent Wood		—— 151. sp. 13.
	The pale Shoulder			
363	Platypteryx falcataria M.	Woods		—— 152. sp. 1.
	The pebble Hooktip			
365	*Tortrix* chlorana M.	Willows		—— 397. sp. 4.
	The bordered Green			
	Christiernana	Hedges in chalky places	7,	—— 399. sp. 13.
	The Christiernian			
	oporana M.	Hedges		—— 427. sp. 105.
	The great Hook-tipped			
	Ribeana	Gardens and hedges		—— 423. sp. 89.
	The common Oblique Bar			
	Acerana	Hedges		—— 425. sp. 99.
	The Maple			
	pruniana	Woods		—— 433. sp. 122.
	The lesser Long-cloak			
	Udmanniana	Pathways, woods		—— 449. sp. 176.
	The Udmannian			
	comitana	Pales		—— 434. sp. 127.
	The cream Short-cloak			
	Mitterbachina	———		—— 463. sp. 220.
	The Mitterbachian			
	Lecheana E.	Open places in woods		—— 403. sp. 27.
	The Lechean			
	Absinthiana	Wormwood		—— 456. sp. 199.
	The wormwood Tortrix			
	harpana	Hedges		—— 437. sp. 135.
	The hooked Marble			
	Lundiana	Paths in woods		—— 452. sp. 187.
*	*The Lundian*			
	fasciana	Hedges		—— 460. sp. 209.
	The Straight-barred			
	Logiana	Elms		—— 464. sp. 224.
	The Logian			
	Forsterana M.	Hedges and woods		—— 421. sp. 84.
	The Forsterian			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
365	*Tortrix* Rosana M.	Gardens		Haw. 424. sp. 96.
	The Rose			
	rugosana B.	Hedges		—— 431. sp. 114.
	The Rough-wing			
	nubiferana M.	——		—— — sp. 117.
	The cloudy White			
	tripunctana	——	7,	—— 432. sp. 120.
	The common Long-cloak			
	aurana	Flowers		—— 446. sp. 163.
	The double Orange-spot			
	atromargana B.	Oaks		—— — sp. 165.
	The black Bordered			
	cana	Pastures	7,	—— 456. sp. 197.
	The hoary Sealed			
	Wœberiana	Pales	7,	—— 457. sp. 201.
	The Wœberian			
	nubilana	Hedges	7,	—— 467. sp. 230.
	The smoky Grey			
368	Botys cineralis	——		—— 380. sp. 12.
	The cinereous Pearl			
	nivealis E.	Woods		—— 385. sp. 29.
	The white Brindled			
371	Crambus Pratorum M.	Meadows	8,	—— 488. sp. 26.
	The dark inlaid Veneer			
	arborum	Grassy banks		—— 486. sp. 18.
	The yellow satin Veneer			
	hortorum	Epping Forest		—— 490. sp. 31.
	The garden Veneer			
	cespitis	——		—— — sp. 32.
	The straw coloured Veneer			
	pineti	——	7,	—— 487. sp. 23.
	The pearl Veneer			
	Rosea	——		—— 489. sp. 28.
	The barred Veneer			
	geniculea	——		—— — sp. 29.
	The elbowed-striped Veneer			
	petrificia	——		—— 485. sp. 13.
	The common Veneer			
	culmorum	Meadows	7,	—— 485. sp. 14.
	The large brown-edged Veneer			
	carnea	——	7,	—— 484. sp. 10.
	The rosy Veneer			
	Cardui	Thistles	7,	—— — sp. 9.
	The thistle Ermine			
	consorta	Marshy places	7,	—— 483. sp. 8.
	The aquatic Veneer			
	gigantea	——	7,	—— 482. sp. 4.
	The gigantic Veneer			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
371	Crambus caudea	Woods	7,	Haw. 482. sp. 1.
	The hooktip Veneer			
	cultrea	Marshy places	7,	—— — sp. 3.
	The pale hooktip Veneer			
	acinacidea	———	7,	—— — sp. 2.
	The narrow-winged Veneer			
373	Pterophorus pentadactylus M.	Nettles		—— 475. sp. 1.
	The large white Plume			
	fuscodactylus	Woods	7,	—— 476. sp. 4.
	The brown wood Plume			
	bipunctidactylus	———	7,	—— — sp. 5.
	The grey wood Plume			
	monodactylus	Weedy banks	7,	—— — sp. 6.
	The hoary Plume			
	tetradactylus	———	7,	—— 477. sp. 7.
	The white-shafted Plume			
	leucadactylus	———	7,	—— — sp. 9.
	The lemon Plume			
	lunædactylus	———	7,	—— — sp. 10.
	The crescent Plume			
	megadactylus	Chalk-pits		—— 478. sp. 12.
	The chalk-pit Plume			
	trigonodactylus E.	Skirts of woods, chalky-places	7,	—— 478. sp. 13.
	The triangle Plume			
	galactodactylus	Lanes and hedges	7,	—— 475. sp. 2.
	The spotted-white Plume			
	punctidactylus	Hedges	7,	—— 479. sp. 16.
	The brindled Plume			
	calodactylus	Skirts of woods	7,	—— 478. sp. 15.
	The beautiful Plume			
	rhododactylus	Roses in gardens	7,	—— — sp. 14.
	The rose Plume			
	tesseradactylus	Hedges and woods	7,	—— 479. sp. 17.
	The marbled Plume			
	pallidactylus	———	7,	—— 478. sp. 11.
	The pale Plume			
	didactylus	———? Norfolk	7,	—— 479. sp. 18.
	The spotted rusty Plume			
	heterodactylus	Hedges and woods	7,	—— — sp. 19.
	The spotted black Plume			
	tridactylus	———	7,	—— 477. sp. 8.
	The dingy white Plume			
	microdactylus	Chalk-pits, Kent	7,	—— 480. sp. 20.
	The small Plume			
	Fumaria plumistrea M.	Grassy pl. & furze on comm.		—— 474. sp. 3.
	The Chimney-sweeper's Boy			
	**Tinea* spissicornis	Dry chalky fields		—— 492. sp. 2.
	The dotted Knot-horn			

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	Tinea contubernea	Dry chalky fields		Haw. 493. sp. 4.
	The mealy Knot-horn			
380	Libellula cancellata	Croydon Canal	7,	Fa.E.S.ii.383.sp.18.
	vulgata	Ponds and ditches	7,	—— ii. 382. sp.16.
	scotica	Ponds, Devon and Scotland	7,	Donovan.
385	Anax Imperator	Ponds and woods, Hants	7,	Page 258.
381	Cordulia ænea	Ponds, New Forest & Epp. For.		—— —
382	Cordulegaster annulatus	Ponds and woods, Hants	7,	—— —
383	Gomphus vulgatissimus	Woods	7,	—— —
384	Æshna grandis	Marshy places	7,	—— —
	viatica	——	7,	Fab.E.S.ii.388.sp.1.
	Juncæa	——	7,	Sowerby Brit. Misc.
	anglicana	——	7,	
	teriuscula	Woods, Kent		
386	Agrion rufescens	Marshy places	7,	
	corea	——	7,	
	sanguineum	——	7,	Page 259.
	puella	——	7,	Fab.E.S.ii.387.sp.2.
	albicans	——		
	annulare	——	7,	
	zonatus	——	7,	
387	Lestes sponsa	——		
388	Calepteryx Virgo	Banks of rivers	7,	
	ludovicia	——	7,	
389	Baëtis bioculata	Marshy places		Fab.E.S.ii.70.sp.9.
390	Cleon pallida	——		
391	Ephemera vulgata	——		—— ii. 68. sp. 1.
392	Panorpa affinis	Hedges	7,	
*	germanica	Cumberland		—— ii. 97. sp. 2.
393	Chrysopa Perla	Hedges and woods	7,8,	Page 260.
	capitata	——	7,8,	Fab.E.S. ii.82.sp.5.
	fulvocephala	——	7,8,	
	reticulata	——	7,8,	
	alba	——	7,8,	Panz. 87. 14.
	perla	——	7,8,	—— — 13.
394	Hemerobius variegatus	——	7,8,	Fab.E.S.ii.85.sp.18.
	Beckwithii	Woods, &c.	7,8,	
	Pini	Hedges and woods	7,8,	
	nemoralis	——	7,8,	
	decussatus	——	7,8,	
	lutescens	——	7,8,	—— ii. 84. sp. 12.
	punctatus	——	7,8,	
	affinis	——	7,8,	
	obscurus	——	6,8,	
	irroratus	——	7,	
	nervosus	——	7,	—— ii. 85. sp. 19.
395	Osmylus maculatus	Running brooks, skirts of woods		Page 260.
396	Sialis niger	Banks of rivers		Fa.E.S.ii.79.sp.20.
397	Raphidia ophiopsis	Hedges near streams		Page 261.

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No. of Gen.	Name.	Where ound.	Other times of ap.	Reference to description.
397	Raphidia Londinensis	Hedges near streams		
	affinis	———		
	maculicollis	———		
	megacephala	———		
402	Clavellaria marginata	Windsor		Page 263.
	Amerinæ	———		Zool. Misc. iii. 112.
404	Abia nigricornis	Woods, Coombe	7,	Page 263.
	sericea	Woods	7,	Zool. Misc. iii. 113.
405	Amasis læta	Bristol		Page 263.
406	Hylotoma pilicornis	Coombe, (Mr. Stephens)		Page 264.
	cærulescens	Woods		Klug. sp. 13.
	femoralis	———		—— sp. 14.
	ustulata	———		—— sp. 8.
	segmentaria	———		—— sp. 9.
	Rosæ	———		—— sp. 10.
	Stephensii	Darent Wood (Mr. Stephens)		Zool. Misc. iii. 125.
	Berberidis	Woods		Klug. sp. 3.
	violacea	———		—— sp. 6.
	pagana	———		—— sp. 11.
	Anglica	———, (Mr. Stephens)		Zool. Misc. iii. 122.
	enodis	———		Klug. sp. 1.
	cærulea	———		—— sp. 7.
	Klugii	Woods, (Mr. Standish)		Zool. Misc. iii. 122.
407*	Cryptus Villersii	Bristol		Page 264.
*	pallipes	Coombe Wood, (Mr. J. King)	7,8,	Zool. Misc. iii. 125.
408	Messa hortulana	Hedges and woods	7,8,	Page 264.
409	Athalia annulata	———	7,8,	Klug. sp. 2.
	Rosæ	———	7,8,	Zool. Misc. iii. 126.
	centifolia	———	7,8,	—— ——
	spinarum	———	7,8,	Klug. sp. 1.
410	Sclandria serva	———	7,8,	—— sp. 7.
	fuliginosa	———	7,8,	—— sp. 37.
	luteiventris	———	7,8,	—— sp. 23.
411	Fenusa pumila	———	7,8,	Page 265.
412	Allantus bicinctus	———	7,8,	
	notha	———	7,8,	
	hæmatopus	———	7,8,	Klug. sp. 84.
	neglectus	———	7,8,	—— sp. 77.
	blandus	———	7,8,	—— sp. 76.
	albocinctus	———	7,8,	—— sp. 94.
	punctum	———	7,8,	—— sp. 85.
	12-punctatus	———	7,8,	—— sp. 91.
	zonatus	———	7,8,	Panz. 64. 9.
	lividus	———	7,8,	Fabr. E. S. ii. 116.
	conspicuus	———	7,8,	[sp. 46.
	rufiventris	———	7,8,	
	lateralis	———	7,8,	—— ii. 118. sp. 53.
	ater	———	7,8,	—— ii. 117. sp. 49.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
412	Allantus punctomaculatus	Hedges and woods	7,8,	
413	Tenthredo Rapæ	———	7,8,	Klug. sp. 96.
	nassata	———	7,8,	Fa.E.S.ii.114.sp.37.
414	Dosytheus Eglanteriæ	———	7,8,	—— ii. 109. sp. 19.
	Junci	———	7,8,	
415	Dolerus opacus	———	7,8,	—— ii. 120. sp. 62.
	Gonagra	———	7,8,	—— ii. 117. sp. 48.
416	Emphytus succinctus	———	7,8,	
	cinctus	———	7,8,	—— ii. 117. sp. 51.
	ceria	———	7,8,	
	tibialis	———	7,8,	Panz. 62. 11.
417	Crœsus septentrionalis	Woods, Darent	7,8,	Page 266.
418	Nematus niger	Hedges and woods	7,8,	Fa.E.S.ii.120.sp.64
	luteus	———	7,8,	Panz. 90. 10.
	lucidus	———	7,8,	
419	Cladius difformis	Coombe Wood	7,8,	Page 266.
420	Tarpa Panzerii	Hedges and woods		Zool. Misc. iii. 131.
	Klugii	———		—— iii. 132.
421	Lyda Betulæ	———		Klug. sp. 13.
	nemorum	———		—— sp. 8.
	erythrocephala	———		—— sp. 16.
422	Lophyrus Pini	Pine woods		—— sp. 2.
	rufus	———		—— sp. 3.
423	Cephus pygmæus	Flowers in fields and hedges		Page 267.
424	Xiphydria Camelus	Willows		——— —
	dromedarius	Hedges		Fa.E.S.ii.128.sp.16
426	Urocerus Gigas	Pines		Page 268.
	psyllius	———		Fa.E.S. ii.124. sp.2.
427*	Evania appendigaster	Hedges?		—— ii. 192. sp. 1.
428	Fœnus Jaculator	Hedges and woods		Page 268.
430	Bracon Desertor	Woods		—— 270.
431*	Sigalphus Irrorator	Hedges	7,	Fa.E.S.ii.152.sp.79
432	Diplolepis Quercus-folii	Oaks	7,	Page 270.
434	Chalcis clavipes	Battersea fields		—— 271.
435	Cynips Capreæ	Willows		Fa.E.S.ii.102.sp.13.
436	Cleptes semi-aurata	Sandy places	7,	Panz. 51. 2.
	aurata	———	7,	Fa.E.S.ii.242.sp.18.
437*	Elampus Panzeri	Walls, Exeter, (Dr. Leach)		Page 272.
438	Chrysis ignita	Sandy banks	7,	Fa.E.S.ii.241.sp.10.
	affinis	———	7,	
	effulgens	———	7,	
	fulgida	———	7,	—— ii. 240. sp. 8.
	bidentata	———	7,8,	—— ii.241. sp.11.
	cyanea	———	7,8,	—— ii.243. sp. 20.
	Stroudera	———	7,8,	Panz. 107. 12.
439	Hedychrum auratum	Sandy places	7,8,	Page 272.
	regium	Sand and sunny banks	7,8,	Fa.E.S.ii.243.sp.19
441	Mutilla Europæa	Sandy places	7,8,	Page 273.
442*	Myrmosa melanocephala	——— ? Norfolk		Fa.E.S.ii.372.sp.27

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
443	Tiphia femorata	Flowers and sandy places	7,	Page 274.
	morio	Woods	7,	Fa.E.S.ii.227.sp.17
444	Sapyga 6-punctata	Palings	7,	
445	Pompilus *viaticus?*	Sandy places	7,	Fabr. Piez.
	gibbus?	———	7,	——— ———
	fuscus?	———	7,	——— ———
	exaltatus?	———	7,	——— ———
	hircanus?	———	7,	——— ———
448	Amophila sabulosa	Sand banks	7,	Page 274.
449	Sphex flavipennis	Sandy places	7,8,	Page 275.
452	Psen ater	Posts and sandy places	7,	——— 276.
454*	Larra ichneumoniformis	Bristol		Fa.E.S. ii.221.sp.4.
455	Lyrops tricolor		7,	Page 277.
456	Dinetus pictus	Windsor	7,	——— ———
457	Trypoxylon Figulus	Flowers?	7,	——— ———
458	Oxybelus uniglumis	Bristol	7,	——— ———
459	Crabro cribarius	Sandy places	7,	——— 278.
460	Stigmus ater	———	7,	——— ———
461	Pemphredon unicolor	———	7,	——— ———
462	Mellinus mystaceus	———	7,	——— ———
463	Cerceris quadricinctus	———	7,	——— 279.
464	Odynerus parietinus	Walls	7,	——— ———
468*	Andrena affinis	Stumps of trees		Kirby ii. 92. sp. 43.
	fulvago	Flowers		——— 93. sp. 44.
	pilipes	Sandy banks		——— 96. sp. 46.
	hæmorrhoidalis	Darent Wood		——— 141. sp. 81.
	Collinsonana	Flowers		——— 153. sp. 93.
	albicrus	Gardens		——— 156. sp. 96.
	chrysura	Round-leaved bell-flower		——— 172. sp. 110.
470*	Sphecodes monilicornis	Flowers on sunny banks?	7,	——— 47. sp. 10.
*	picea	———	7,	——— 48. sp. 11.
*	divisa	———	7,	——— 49. sp. 12.
*	Sphecoides	———	7,	——— 46. sp. 9.
473	Ceratina cærulea	Flowers of the rag-wort	7,8,	Page 283.
474	Chelostoma florisomne	Flowers in hedges	7,	——— 284.
481	Nomada cornigera	Sunny and sandy banks	7,	Kirbyii. 190.sp.11.
*	sex-cincta	Banks?		——— 198. sp. 17.
*	Schæfferella	———		——— 199. sp. 18.
*	connexa	———		——— ——— sp. 19.
*	Fabriciella	Sunny banks?	7,	——— 218. sp. 29.
	flavo-gutta	———	7,	——— 215. sp. 31.
	rufo-cincta	———	7,	——— 216. sp. 32.
	Sheppardana	———	7,	——— 217. sp. 33.
*	ferruginata	———	7,	——— 218. sp. 34.
484	Eucera longicornis	Sandy banks	7,	Page 287.
487	Bombus Muscorum	Meadows and fields	7,	Kirby ii. 317. sp. 74
	Francillonana	Flowers	7,	——— 319. sp. 75.
	floralis	———	7,	——— 321. sp. 76.
	Beckwithella	———	7,	——— 323. sp. 78.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
487	Bombus Curtisella	Flowers	7,	Kirby ii.324.sp.79.
	Fosterella	——	7,	—— 325. sp. 80.
	agrorum	——	7,	—— 326. sp. 81.
	Rossiella	——	7,	—— 321. sp. 85.
	Leeana	——	7,	—— 333. sp. 86.
	Francisana	——	7,	—— 334. sp. 87.
	Jonella	——	7,	—— 338. sp. 90.
	hortorum	Flowers in gardens	7,	—— 339. sp. 91.
	Scrimshirana	Flowers	7,	—— 342. sp. 92.
	Barbutella	——	7,	—— 343. sp. 93.
	Tunstallana	——	7,	—— — sp. 94.
	vestalis	Corn fields	7,	—— 347. sp. 95.
	Sorensis	Flowers	7,	—— 355. sp. 98.
	Donovanella	——	7,	—— 357. sp. 100.
	Burrellana	Flowers in gardens	7,	—— 358. sp. 101.
	Cullumana	Flowers	7,	—— 359. sp. 102.
	Derhamella	——	7,	—— 363. sp. 105.
	lapidaria	——	7,	—— — sp. 106.
	Raiella	——	7,	—— 367. sp. 107.
	rupestris	——	7,	—— 369. sp. 108.
	subterranea	——	7,	—— 371. sp. 109.
	Harrisella	——	7,	—— 373. sp. 110.
499	Stratiomys Chamæleon	Marshes	7,	Page 292.
500	Odontomyia furcata	——	7,	—— — [sp. 17.
	hydroleon	——		Fabr. E. S. iv. 267.
	vulpina	——		Panz. 58. 4.
501	Clitellarium Ephippium	Skirts of woods		Fa.E.S.iv.264.sp.6.
505	Sargus cupreus	Flowers in meadows		Page 292.
506	Tabanus *bovinus*	Meadows		Stewart ii. 267.
	Paganus	New Forest, Hants		—— ——
507	Hæmatopota pluvialis	Hedges		Page 293.
508	Chrysops cæcutiens	Hedges and commons	7,	—— —
509	Rhagio scolopaceus	Trunks of trees		—— —
510	Atherix maculata	Darent Wd. (Mr. Stephens)		—— 294.
511	Dolychopus nobilitatus	Moist places in woods		—— —
512	Thereva plebeia	Woods and commons	7,	—— —
514	Asilus crabroniformis	Commons and heaths		—— —
515	Dasypogon punctatus	Sandy commons		—— 295. [sp. 53.
516	Dioctria œlandica	Skirts of woods	7,	Fab. E. S. iv. 388.
518	Empis pennipes	Hedges		—— iv. 404. sp. 5.
	borealis	——		—— iv. 403. sp. 1.
519	Anthrax Hottentotta	Borders of woods, Devon		Page 295. [sp. 23.
	Abbadon	Devon		Fab. E. S. iv. 262.
522	Ogcodes gibbosus	Coombe		—— iv. 311.sp.121
524*	Sericomya Lapponum	Marshes, Dartmoor		Page 296.
525	Volucella pellucens	Woods	7,	—— — [sp. 5.
	mystaceus	——	7,	Fab. E. S. iv. 279.
	bombylans	——	7,	—— iv. 279. sp. 4.
	inanis	Skirts of woods	7,	—— iv. 278. sp. 1.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
526	Eristalis Narcissi	Flowers in marshes		Page 297. [sp. 17.
527	Helophilus pendulus	Hedges	7,	Fabr. E.S. iv. 282.
528	Syrphus Pyrastri	Hedges and flowers		——iv.305.sp.102
529	Doros conopseus	Fields, Colney Hatch	6,	—— iv. 297. sp.69.
530	Chrysotoxum arcuatum	Hedges		Page 297.
532	Aphritis auro-pubescens	New Forest, (Messrs. Bentley and Chant)		—— —
533	Milesia annulata	Borders of woods		—— 298.
534	Conops aculeata	Hedges		—— —
536	Myopa picta	———	7,	Panz. 54. 22.
540	Tephritis pulchella	Flowers in hedges		F.E.S.iv.352.sp.167
	Cardui	Thistles		Page 299. [158.
	vibrans	Flowers		Fa. E.S. iv. 350. sp.
	onopordinis	———		——iv.360.sp.198.
	grossificationis	Gardens		——iv.351.sp.162.
542	Sepedon palustris	Marshes		Panz. 60. 23.
543	Loxocera Ichneumonea	Flowers in marshes		—— 73. 24.
545	Anthomyia pluvialis	Woods		Page 300.
547	Scenopinus niger	Houses near woods		—— —
548	Ochthera Mantis	Devonshire, (Dr. Leach)		—— —
549	Phasia variabilis	———, (Dr. Leach)		—— —
551	Ocypteryx lateralis	Woods and pales		—— 301. [sp. 63.
	Brassicaria	Trunks of trees		Fabr. E.S. iv. 327.
	puparum	Hedges		—— iv.326.sp.58,
	larvarum	———		—— iv. — sp. 59.
555	Œstrus ovis	Sheep in pastures	7,	Clark 59.
557	Hippobosca equina	Horses, New Forest, Hants		Page 302.
559	Craterina Hirundinis	Swallows	7,	—— 303.

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10*	Clubiona Nutrix		8,	Page 124.
19	Thomisus oblongus	Hedges	8,	—— 128.
20	Lycosa saccata	Gardens		—— 129.
16	Panagæus crux-major	Sand-pits, Bexley	3,	—— 147.
22	Trechus humeralis	Meadows, Battersea		
24	Aëpus flavescens	Und. stones S. coast of Devon	5,	—— 149.
60	Colymbetes fontinalis	Ponds, Devon (Dr. Leach)		
68*	Melasis flabellicornis	Woods, Norwich, Windsor		—— 160.
73	Scirtes hemisphærica	Aquatic plants	8,9,	—— 163.
166*	Trichius fasciatus	Umbelliferous plants		—— 191.
181	Serropalpus ——— ?	Rotten oaks, New. F. Hants.		—— 195.
196	Salpingus 4-pustulatus	Palings, Camberwell Grove	8,	Marsh.297.sp.171.
205	Apion Viciæ	Tufted Vetch		Kirby T.L.S. ix.
	Ervi	Yellow Lathyrus		—— ——
	Lathyri	———		—— ——
	Ononis	Restharrow		—— ——
	subulatum	Yellow Lathyrus		—— ——

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205	Apion Craccæ	Tufted Vetch	8,	Kirby T. L.S. ix.
207	Lixus paraplecticus	Water Hemlock	8,	Marsh. 272. sp. 106.
208	Rhynchænus Lathburii	Sandy places, Hants		
215	Cossonus hypoleucus	Herts		—— 274. sp. 109.
224	Mycetophagus multipunctatus	Dry Boleti	8,	—— 139. sp. 3.
229	Prionus coriarius	Lanes near woods & old trees		Page 208.
230	Lamia sutor	Trunks of trees	8,	Marsh. 329. sp. 7.
231	Saperda lineato-collis	———		Page 209.
236	Leptura 4-fasciata	Umbelliferous plants	8,	Marsh. 354. sp. 31.
	apicalis	———	8,	Haworth's MSS.
240	Crioceris puncticollis	Sand-pits, Bexley	8,9,	
	melanopa	Skirts of woods	8,9,	Marsh. 215. sp. 5.
241	Cassida Spergulæ	Corn-spurrey, sandy fields	8,	—— 144. sp. 3.
246	Chrysomela varians	St. John's-wort, Coombe Wood		—— 173. sp. 10.
	fulgida	Whittlesea Mere		Fa. S. E. i. 432. sp. 59.
263	Conocephalus varius	Hedges and woods	8,9,	—— ii. 42. sp. 35.
	griseus	———	8,	—— ii. 41. sp. 31.
266	Acrydium sabulatum	Sandy places	8,	Page 219.
	bipunctatum	Grassy banks, Battersea	8,	Fa. S. E. ii. 26. sp. 2.
274	Lygæus apterus	Woods and hedges	8,9,	—— 222.
311	Papilio Machaon *l.*	Umbelliferous plants	9,	—— 235.
	The Swallow-tail.			
314	Pontia Napi B.	Gardens and woods	5,	—— 236.
	The green-veined White.			
	Daplidice E.	Dover (Mr. Stephens)		—— —
	The green-chequered White			
315	Melitæa Silene B.	Woods and waste ground		—— 237.
	The small Pearl-bordered Fritillary.			
316	Argynnis Lathonia B.	Open parts in woods, &c.	5,	—— —
	The Queen of Spain Fritillary.			
	Aglaia B.	———		—— —
	The dark-green Fritillary.			
	Adippe B.	———		—— —
	The high-brown Fritillary.			
	Paphia B.	Borders of woods		—— —
	The silver-washed Fritillary.			
317	Vanessa Atalanta *l.* B.	Nettles		Haw. 28.
	The red Admiral.			
	Cardui *l.* M.	Spear thistle		—— 21.
	The painted Lady.			
	Cardui E.	Meadows		Page 238.
	The painted Lady.			
	Antiopa *l.* B.	Birch and sallow		Haw. 27.
	The White-bordered.			
	Io *l.* B.	Nettles		—— 18.
	The Peacock.			
	Io M.	Lanes, woods, &c.		Page 238.
	The Peacock.			
	polychloros M.	Near elms		—— —
	The large Tortoiseshell.			

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317	Vanessa C. album *The white C.*	E.	Skirts of woods	9,	Page 238.
318	Apatura Iris *The purple Emperor*	M.	Oaks, Coombe; woods, Kent	——	239.
319	Limenitis Camilla *The white Admiral*	B.	Woods	——	240.
320	Hipparchia Galatea *The marbled White*	B.	Moist woods	——	—
	Pilosellæ *The large Heath*	M.	Grassy commons	——	—
	Megæra *The Wall*	B.	Moist places and lanes	8, ——	—
	Semele *The Grayling*	M.	Heaths, commons, &c.	——	241.
321	Thecla Pruni *The black Hair-streak*	*l.* B.	Plum-trees		Haw. 38.
	Pruni *The black Hair-streak*	E.	Borders of woods		Page 241.
	Quercus *The purple Hair-streak*	M.	Oak-woods	——	—
	Rubi *The green Hair-streak*	*l.* B.	Bramble		Haw. 39.
322	Lycæna dispar *The large Copper*	E.	Fens near Cambridge		Page 241.
	Arion *The large Blue*		Chalky places		Haw. 43. sp. 55.
	Corydon *The chalk-hill Blue*	B.	——, Darn, Dover	8,	Page 241.
	Dorylas *The common Blue*	*l.* E.	Grassy banks	4,	Haw. 45.
	Argus *The studded Blue*	M.	Grassy commons		Page 242.
	Idas *The black-spot Brown*	M.	Clover-fields	5, ——	—
	Artaxerxes *The white-spot Brown*	E.	Meadows, Scotland	——	—
	Alsus *The Bedford Blue*	B.	Clover-fields	5, ——	—
	Cymon *The mazarine Blue*	E.	Chalky places	5, ——	—
323	Hesperia Sylvanus *The wood Skipper*	E.	Skirts of woods	5, ——	—
	Linea *The small Skipper*	M.	——	——	—
328	Egeria Crabroniformis *The lunar Hornet*	M.	Willows	——	245.
	Culiciformis *The red-belted Clearwing*	B.	Gardens		Haw. 71. sp. 26.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
328	Egeria Formiciformis B. *The flame-tipped Red-belt*	Gardens		Haw. 71. sp. 27.
333	Zeuzera Æsculi B. *The wood Leopard*	Trunks of trees		Page 246.
336	Laria fascelina M. *The dark Tussock*	Woods		—— 247.
337	Gastropacha quercifolia B. *The lappet Moth*	Skirts of woods		—— —
	Pini *The Pine Lappet*	Pine-trees, Norfolk		Haw. 80. sp. 4.
338	Odenesis potatoria E. *The Drinker*	Grassy banks		Page 247.
339	Lasiocampa Quercus E. *The large Eggar*	Skirts of woods		—— —
343	Notodonta tritopha B. *The great Prominent*	Trunks of trees		—— —
	Ziczac B. *The pebble Prominent*	——		Haw. 99. sp. 26.
	cuculla E. *The Maple Prominent*	Oaks		—— — sp. 22.
345	Cerura Furcula E. *The Kitten*	Palings		Page 248.
346	Arctia Caja E. *The Garden Tyger*	——		—— —
	Salicis *The Satin*	Willows, sallows		—— —
	chrysorrhœa E. *The yellow Tail*	Hedges		—— —
347	Callimorpha Rosea M. *The red Arches*	Oaks		—— —
348	Lithosia rubricollis M. *The black Footman*	——		Haw. 149. sp. 9.
	eborina M. *The four-spot small Footman*	Open places in woods		—— 147. sp. 6.
	irrorea *The dew Moth*	Grassy commons		—— 148. sp. 8.
	Bombyx Coryli M. *The nut-tree Tussock*	Skirts of woods	4,	—— 102. sp. 32.
	gonostigmata B. *The scarce Vapourer*	Woods	8,	—— 132. sp. 93.
	**Nudaria* rotunda *The round-winged Muslin*	Hedges? Battersea		—— 156. sp. 2.
	Apoda Testudo M. *The Festoon*	Woods, Kent		—— 137. sp. 1.
354	*Noctua* Myrtilli E. *The beautiful yellow Underwing*	Heaths near Erith	6,	—— 162.
	umbratica M. *The large Pale Shark*	Shady pales and rails		—— 164.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua* Chamomillæ M.	Shady pales and rails		Haw. 165.
	The Chamomile Shark			
	Tanaceti	———		—— —
	The Tansy Shark			
	Lactucæ	———		—— 166.
	The Lettuce Shark			
	Lucifuga	———		—— —
	The large dark Shark			
	Verbasci *l.*	The Mullein		—— 167.
	The Mullein			
	Asteris	Gardens		—— 168.
	The Starwort			
	Absinthii B.	Places where wormwood grows		—— —
	The Wormwood			
	exoleta *l.*	The yellow Iris, marshes		—— —
	The large Sword-grass			
	lithoxylea B.	Shady pales and rails		—— 169.
	The light Arches			
	hepatica M.	Skirts of woods		—— —
	The clouded-bordered Brindle			
	epomidion B.	———		—— 170.
	The clouded Brindle			
	Scolopacina E.	——— Yorksh. (Mr. J. Chant)		—— — sp. 28.
	The slender-clouded Brindle			
	semi-brunnea B.	Shady pales		—— 171.
	The tawny Pinion			
	fuliginosa E.	———		—— 174.
	The smoky Wainscot			
	punctina	———		—— —
	The dotted-bordered Wainscot			
	rufescens E.	Garden pales		—— 175.
	The red Wainscot			
	pallens M.	———		—— —
	The common Wainscot			
	atomina *l.* E.	Carex		—— —
	The powdered Wainscot			
	Ranunculina E.	Gardens and pales		—— 183.
	The small Ranunculus			
	oculata	Trunks of trees		—— 186.
	The great Brocade			
	argentina B.	———, Coombe, Darn		—— —
	The silvery Arches			
	advena B.	Gardens		—— 187.
	The pale shining Brown			
	Dens-canis	Trunks of trees, Kent		—— 190.
	The Dog's-tooth			
	Brassicæ	Pales	6,8,	—— 191.
	The Cabbage Moth			

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JULY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua* populeris	Woods		Haw. 195.
	The feathered Gothic			
	marginosa M.	Norfolk	——	——
	The bordered Gothic			
	Cucubali	Woods	——	196.
	The Campion			
	Upsilon	Trunks of willows	——	197. sp. 105.
	The Dismal			
	fusca	Coombe	——	204.
	The barred-feathered Rustic			
	phæa	Skirts of woods	——	205.
	The feathered Rustic			
	xanthographa	——	——	206.
	The dotted Rustic			
	redacta	Gardens	——	——
	The lesser-dotted Rustic			
	egens	——	——	——
	The garden Rustic			
	Sepii	——	——	——
	The mottled Rustic			
	obsoletissima	——	——	207.
	The brown Rustic			
	lævis	Skirts of woods	——	——
	The grey Rustic			
	sordida	Gardens	——	——
	The sordid Rustic			
	blanda	——	——	208.
	The powdered Rustic			
	lunina	Hedges	——	209.
	The Crescent			
	biloba M.	——	——	——
	The Double-lobed			
	literosa E.	Gardens, Norfolk	——	213.
	The rosy Minor			
	præduncula	Woods	8, ——	——
	The marbled Minor			
	strigilis	Hedges	——	214.
	The minor Beauty			
	latruncula	——	——	——
	The tawny-marbled Minor			
	humeralis	——	——	215.
	The cloaked Minor			
	terminalis	——	8, ——	——
	The flounced Minor			
	fasciuncula	——	——	——
	The middle-barred Minor			
	monilea E.	Weedy banks	——	219.
	The necklace Dart			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354*	*Noctua picea*	Weedy banks, Surrey		Haw. 220.
	The pitchy Dart			
	augur B.	———	——	—
	The double Dart			
	fumosa	Gardens	——	221.
	The dark Rustic			
	nigricans B.	———	——	—
	The garden Dart			
	ruris	———	——	—
	The rufous Dart			
	obeliscata	Woods	——	222.
	The square-spot Dart			
*	sordida	Woods, Kent	——	—
	The striped-square Spot			
	valligera B.	Gardens	——	—
	The wedge-barr'd Dart			
	albilinea B.	———	——	223.
	The white-line Dart.			
*	lineolata	——— ?	——	—
	The lineolated Dart			
	pupillata E.	Grassy places ?	——	—
	The pupilled Dart			
	sagittifera	Grassy commons	——	224.
	The Archer's Dart			
	graminis	Grassy banks	——	—
	The Antler			
	Ericæ E.	Heaths, Kent	——	—
	The Lover's Knot			
	festiva B.	Skirts of woods	——	226.
	The ingrailed Clay			
	subrufa B.	———	——	227.
	The rufous Clay			
	erythrocephala	———	——	—
	The barred Chesnut			
	cypriaca	Weedy banks and houses	——	—
	The rosy Rustic			
	punicea	Weedy banks	——	228.
	The small Square-spot			
	grisea B.	Skirts of woods	——	229.
	The bright-eyed Clay			
	marginago	Woods	——	235.
	The bordered Sallow			
	citrina	Heaths	——	237.
	The dusky Sallow			
	angulago E.	Paths in woods	——	239.
	The angle-striped Sallow			
	conigera E.	Skirts of woods	——	—
	The brown-line Bright-eye			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua* batis M.	Skirts of woods	6,	Haw. 245.
	The peach Blossom			
	triplacea	Gardens		—— 245.
	The dark Spectacle			
	Asclepiades E.	Weedy banks		—— 246.
	The light Spectacle			
	affinis E.	Skirts of woods		—— 247.
	The lesser-spotted Pinion			
	Delphinii	Gardens, Windsor	6,	—— 248.
	The pease Blossom			
	turca	Woods		—— 250.
	The double Line			
	subtusa	Trunks of trees		—— —
	The Olive			
	gracilis M.	———		—— 251.
	The Slender-bodied			
	retusa E.	Trunks of willows		—— —
	The double Kidney			
	Festucæ *l.* et *p.* E.	Meadow reed-grass, ditches		—— 254. sp. 1.
	The gold Spot			
	straminea E.	Clover fields		—— 263. sp. 25.
	The bordered Straw			
	Dipsacea E.	———	8,	—— — sp. 26.
	The marbled Clover			
	Fraxini	Trunks of trees		—— 267. sp. 1.
	The Nonpareil			
	sponsa E.	Oaks		—— 268. sp. 3.
	The dark crimson Underwing			
	promissa	Tr. of trees, Richmond Park		—— — sp. 4.
	The light crimson Underwing			
	conjuga	Trunks of trees		—— 269. sp. 5.
	The lesser crimson Underwing			
	Geometra margaritaria M.	Bushy places	8,	—— 299. sp. 77.
	The light Emerald			
	Papilionaria E.	Woods		—— 298. sp. 75.
	The large Emerald			
	rhomboidaria M.	Open places in woods		—— 276. sp. 12.
	The willow Beauty			
	varieta	Skirts of woods, (Mr. Hatchett)		—— 327. sp. 33.
	The grey Carpet			
	rubiadata B.	Woods		—— 325. sp. 28.
	The Flame			
	sinuata B.	———, near Dartford		—— 326. sp. 29.
	The royal Mantle			
	fulvata	Thickets and bushes		—— 328. sp. 35.
	The barred Yellow			
	Populata E.	Weedy banks		—— 341. sp. 77.
	The barred Straw			

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JULY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra comitata E.	Weedy banks		Haw. 342. sp. 78.
	The dark Spinach aversata M.	Shady groves	9,	—— 349. sp. 101.
	The ribband Wave strigilata B.	Skirts of woods, chalky places		—— 350. sp. 107.
	The subangled Wave subroseata E.	Grassy pl. near the sea, Norf.		—— 351. sp. 108.
	The rosy Wave immutata	Marshy places, Norfolk		—— 352. sp. 112.
	The lesser Cream-wave subsericeata	Open places in woods		—— — sp. 113.
	The satiny Wave emarginata E.	Open parts, Coombe Wood		—— 347. sp. 96.
	The scolloped Double-line consignata	Woods		—— 357. sp. 128.
	The Pinion spotted Pug succenturiata	Coombe Wood		—— 358. sp. 130.
	The bordered Lime-speck destrigaria E.	Pathways, woods		—— 276. sp. 11.
	The light-mottled Beauty apiciaria E.	Bushes and thickets		—— 295. sp. 68.
	The bordered Beauty costastrigata	T. of trees, Westerham, Kent		—— 319. sp. 10.
	The twin-striped Pinion fusco-undata	Skirts of woods		—— 321. sp. 16.
	The yellow-striped Highflyer sylvaticata E.	Hedges, chalky places		—— 332, sp. 49.
	The wood Carpet marginata	Bushes and thickets	5,	—— 337. sp. 66.
	The clouded Border inornata E.	Open places in woods		—— 349. sp. 103.
	The plain Wave virgulata	Hedges		—— 354. sp. 120.
	The small Dusty Wave clathrata M.	Clover-fields, Kent	5,	—— 348. sp. 98.
	The latticed Heath V. ata E.	Gardens		—— 364. sp. 152.
	The V. *Pug* limbaria	Broom-fields		—— 286. sp. 40.
	The frosted Yellow ditaria B.	Open parts in woods		—— 299. sp. 79.
	The blotched Emerald quadrifasciaria E.	Hedges, Hertford		—— 307. sp. 100.
	The large Twin-spot didymaria E.	Scotland and Yorkshire		—— 306. sp. 99.
	The twin-spot Carpet amataria	Skirts of woods		—— 296. sp. 71.
	The large Blood-vein			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra volutaria E.	Chalky places		Haw. 298. sp. 76.
	The small Emerald citraria	Clover-fields		—— 288. sp. 43.
	The yellow Belle bipunctaria M.	Chalky places		—— 303. sp. 89.
	The Chalk Carpet Lichenaria E.	Open parts in woods and pales		—— 280. sp. 25.
	The Brussel's Lace prasinaria B.	Grassy places		—— 299. sp. 78.
	The grass Emerald Syringaria B.	Paths in woods		—— 293. sp. 60.
	The lilac Beauty Juliaria	——		—— — sp. 59.
	The July Thorn imitaria E.	Bushy places		—— 297. sp. 72.
	The small Blood-vein paludata	Chalky places		—— 355. sp. 122.
	The lace Border propugnata M.	Thick woods		—— 334. sp. 55.
	The flame Carpet Crepuscularia	Skirts of woods		—— 277. sp. 15.
	The small Ingrailed extersaria B.	Woods		—— — sp. 16.
	The brindled White-spot V. nigraria	Pales ?		—— 282. sp. 32.
	The sooty V sambucaria B.	Hedges		—— 297. sp. 73.
	The Swallow-tail Grossulariata E.	Hedges and gardens		—— 316. sp. 1.
	The common Magpie pantaria	Devonshire		—— 317. sp. 4.
	The Panther unangulata B.	Thickets and bushes		—— 332. sp. 48.
	The sharp-angled Carpet procellata E.	Hedges in chalky places		—— 336. sp. 63.
	The chalk Carpet elatata	Skirts of woods		—— 321. sp. 15.
	The July Highflyer immanata B.	Open paths in woods, Kent		—— 323. sp. 22.
	The dark-marbled Carpet marmorata	Hedges, Westerham, Kent	8,	—— 324. sp. 23.
	The marbled Carpet			
362	*Herminia* albistrigalis	Hedges	7,	—— 368. sp. 10.
	The white-line Snout angustalis M.	Coombe Wood		—— 368. sp. 8.
	The small Snout pinguinalis E.	Houses		—— 371. sp. 17.
	The large Tabby			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
362	*Herminia* barbalis B. *The common Fanfoot*	Pathways in woods	5,	Haw. 368. sp. 11.
*	Bombycalis *The long-tailed Snout*	Skirts of woods ?		—— — sp. 9.
363	Platypteryx hamula M. *The oak Hooktip*	Oak woods		—— 153. sp. 2.
365	*Tortrix* viridana *The Pea-green*	Oaks		—— 396. sp. 3.
	Degenerana *The large Marbled*	Pathways in woods		—— 406. sp. 38.
	cerusana E. *The white Treble-spot*	Elm-trees		—— 416. sp. 72.
	plumbeolana *The clouded Straw*	Open places in woods		—— 420. sp. 81.
	Xylosteana *The forked Red-bar*	Oaks		—— 428. sp. 107.
	Avellana B. *The hazel Tortrix*	Hedges and pathways, woods		—— 421. sp. 85.
	Carpiniana *The dark oblique Bar*	Hedges		—— 422. sp. 83.
	Pomona *The Codling*	Apple-trees and garden pales		—— 457. sp. 200.
	Fagana *The small green Silver-lines*	Paths in woods	5,	—— 395. sp. 2.
	Smeathmanniana E. *The Smeathmannian*	Burdock, Battersea-fields		—— 400. sp. 17.
	borana E. *The crested Buff*	Hedges		—— 415. sp. 68.
	subocellana B. *The retuse Marble*	———		—— 437. sp. 136.
	angustana B. *The barred Marble*	———		—— 438. sp. 140.
*	nana *The barred Dwarf*	Broom-fields		—— 439. sp. 142.
	nebulana *The clouded Iron*	——— ? Kent		—— 461. sp. 215.
368	*Botys* stratiotalis B. *The ringed China-mark*	Ponds		—— 383. sp. 24.
	hybridalis *The rush Veneer*	Coombe Woods		—— 386. sp. 32.
	cucullatalis B. *The Short-cloaked*	Hedges		—— 387. sp. 35.
	Lemnata *Small China-mark*	Moist places		—— 384. sp. 25.
	literalis *The lettered China-mark*	———		—— — sp. 26.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
368	*Botys* Sambucata	Moist places		Haw. 383. sp. 23.
	The garden China-mark			
	nymphæata	——		—— 383. sp. 22.
	The beautiful China-mark			
	Potamogata	——		—— 382. sp. 21.
	The large China-mark			
	Urticata	Hedges		—— —— sp. 20.
	The small Magpie			
	verticalis	——		—— 376. sp. 1.
	The Mother-of-pearl			
	hyalinalis	——		—— 377. sp. 2.
	The scarce Pearl			
	limbalis	——		—— 378. sp. 5.
	The lesser Pearl			
	angustalis	——		—— 379. sp. 8.
	The narrow-winged Pearl			
	terminalis	——		—— —— sp. 9.
	The bordered Pearl			
	glabralis	——		—— 380. sp. 13.
	The dingy Pearl			
	palealis	——, Norfolk		—— 378. sp. 4.
	The Sulphur			
	longalis	——, Charlton		—— 379. sp. 7.
	The long-winged Pearl			
	verbascalis	——		—— 381. sp. 16.
	The straw China-mark			
	ochrealis	——		—— —— sp. 17.
	The small straw China-mark			
	arcualis	——		—— 380. sp. 14.
	The rusty China-mark			
	lutealis	——		—— —— sp. 11.
	The pale Straw			
	forficalis	Gardens		—— 377. sp. 3.
	The garden Pebble			
	elutalis	Hedges		—— —— 378. sp. 6.
	The chequered Straw			
	flavalis	——		—— 381. sp. 15.
	The gold China-mark			
	sericealis E.	——		—— —— sp. 18.
	The straw Dot			
	ferrugalis	——		—— 382. sp. 19.
	The rusty Dot			
	nebulalis	——		—— 386. sp. 31.
	The dusky Brindled			
	atralis	——	5,	—— 388. sp. 36.
	The White-spotted			
	punicealis	——	5,	—— 389. sp. 38.
	The Purple and Gold			

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
368	*Botys* ostrinalis	Hedges	5,	Haw. — sp. 39.
	The scarce Purple and Gold			
	Porphyrialis	———	5,	—— 389. sp. 40.
	The Porphyry			
	cespitalis	Chalky places	5,	—— 390. sp. 42.
	The Straw-barred			
	sordidalis	———	5,	—— 391. sp. 43.
	The dingy Straw-barred			
	anguinalis	———	5,	—— — sp. 45.
	The wavy-barred Sable			
	cingulalis	———, Devon	5,	—— — sp. 44.
	The silver-barred Sable			
369	Pyralis capreolalis	Stables, &c.		—— 372. sp. 20.
	The small Tabby			
	pinguinalis	———		—— — sp. 18.
	The Tabby			
	glaucinalis	Gardens		—— 374. sp. 24.
	The Double-striped			
	farinalis	Houses		—— 374. sp. 22.
	The meal Moth			
	costalis	Hedges		—— 375. sp. 25.
	The gold Fringe			
	Tinea bistriga	Skirts of woods		—— 496. sp. 16.
	The double-striped red Knot-horn			
380	Libellula Donovani	Ponds, New Forest, Hants		N. S.
399	Atropos lignaria	Houses	8,9,	Page 261.
400	Cimbex Europæa	Darent Wood and Windsor		—— 262.
	varians	Coombe and Darent Wood		Zool. Misc. iii. 105.
	10-maculata	Windsor		—— —— 106.
	maculata	Darent Wood		—— —— —
	annulata	Windsor		—— —— 107.
	Griffinii	Norwich		—— —— —
*	humeralis	Salisbury		—— —— —
401	Trichiosoma sylvaticum	Woods		Page 265.
	Scalesii	Coombe Wood		Zool. Misc. iii. 111.
*	unidentatum	Darent Wood		—— —— —
419	Cladius difformis E.	Copenhagen Fields		Page 266.
425	Oryssus coronatus	Darent Wood, (Dr. Leach)		—— 268.
432	Diplolepis ——— ?	Pales, Camberwell Grove		N. S. ?
466	Colletes fodiens	Flowers of the ragwort	8,	Kirby ii. 34. sp. 2.
468	Andrena tibialis	Tansy	8,	—— 107. sp. 52.
	Mouffetella	———	8,	—— 108. sp. 53.
	Listerella	Thistles, &c.	8,	—— 137. sp. 76.
	fulvicrus	Ragwort, &c.	8,	—— 138. sp. 77.
471	Hylæus annulatus	Dyers weed, &c.	8,	—— 36. sp. 3.
	annularis	———	8,	—— 38. sp. 4.
	dilatatus	———	8,	—— 39. sp. 5.
	signatus	———	8,	—— 41. sp. 6.

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JULY.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
475	Heriades Campanularum	Bell-flowers	8,	Kirby ii.256.sp.50.
477	Anthidium manicatum	Gardens		Page 284.
478*	Osmia leucomelana	Trunks of trees?		Kirby ii.260.sp.52.
	cærulescens	Chalky and sandy places		—— 264. sp. 55.
*	Tunensis	Clayey banks		—— 269. sp. 56.
	bicolor	Gardens		—— 277. sp. 58.
479	Megachile Willughbiella	Trunks of willows		—— 233. sp. 41.
*	maritima	Near the sea shore, Suffolk		—— 242. sp. 43.
480	Cælioxys conica	Flowers		Page 285.
481*	Nomada Lathburiana	Sunny banks?	8,	Kirby ii. 183. sp. 6.
*	flava	———?	8,	—— 186. sp. 8.
*	rufiventris	———?	8,	—— 187. sp. 9.
*	rufo-picta	Flowers and banks		—— 207. sp. 24.
*	Hillana	———		—— 208. sp. 25.
*	schrostoma	———		—— 209. sp. 26.
*	ruficornis	———		—— 210. sp. 27.
*	Xanthosticta	———		—— 213. sp. 28.
	quadrinotata	Coombe Wood		—— 215. sp. 30.
482	Epeolus variegatus	Sandy places, Kent	8,	Page 286.
486	Saropoda rotundata	Flowers, sandy pl. Coombe Wood		Kirby ii.291.sp.66.
487*	Bombus flavicollis	Thistles? Sheffield, (Mr. Salt)	8,	Sow. B.M. i. pl 19.
	virginalis	Various flowers	8,	Kirby ii.349.sp.96.
	terrestris	———	8,	—— 350. sp. 97.
	Stylops tenuicornis	Spiders webs, (Mr. Sowerby)		—— L. T. xi. 233.
504	Vappo ater	Hedges, Darent and Greenhithe		Page 292.
506	Tabanus *tropicus*	Palings, meadows		Stewart ii. 267.
507	Hæmatopota pluvialis, *var.*	Palings, New Forest		—— — sp. 5.
515	Dasypogon punctatus	Sandy commons		Page 295.
517	Gonypes tipuloides	Woods		Stewart ii. 294.
520*	Bombylius minor	———? Devonshire		—— ii. 274.
525	Zodion conopsoides	Umbelliferous plants		Page 298.
551	Ocypteryx Mortuorum	Skirts of woods		Lin. S. N. ii. 989.
552	Gymnosoma rotundatum	Umbelliferous plants		Page 301.
553	Echinomyia grossa	Coombe Wood		—— —
556	Gasterophilus veterinus	Horses, on commons	8,	Clark 33.
558	Ornithomyia viridis	Crows, &c.	8,	Leach Wern. Tran.

AUGUST.

8	Geophilus carpophagus	Garden fruit	9,	Page 117.
4	Phalangium Opilio	Walls and rocks	9,	—— 120.
12	Agelena labyrinthica	Fields	9,	—— 125.
18	Epeira Diadema	Gardens	9,	—— 127.
2	Ocypete rubra	Insects		—— 131.
20	Bembidium flavipes	Roots of grass, sandy places	4,6,	Marsh. 394. sp. 9.
25	Zabrus gibbus	Corn-fields	9,	Page 149.

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
49	Lebia crux-minor	Trees, Coombe (Mr. J. Standish)	9,	Page 155.
60	Colymbetes agilis	Ponds? Norfolk		
69*	Ceratophytum Latreillii	New Forest, Hants, (Mr. Millard)		Page 161.
96	Cryptophagus cellaris	Under bark	9,10,	Gyll. i. 168. sp. 4.
	Populi	———	9,10,	—— 165. sp. 1.
	Typhæ	———	9,10,	—— — sp. 12.
	denticulatus	———	9,10,	Marsh. 111. sp. 18.
	serratus	———	9,10,	—— 109. sp. 9.
	hirtus	———	9,10,	Gyll. i. 184. sp. 23.
113	Tachinus subterraneus	Fungi	9,10,	—— ii. 252. sp. 2.
	trimaculatus	———	9,10,	—— 275. sp. 21.
114	Aleochara lanuginosa	———	9,10,	—— 432. sp. 54.
	fuscipes	———	9,	—— 428. sp. 50.
	rivularis	———	,10,	—— 382. sp. 5.
189	Rhipiphorus paradoxus	Hornets nests		Page 197.
	humeralis?	Wasps nests		—— —
207	Lixus productus	Drills in marshes		Marsh. MSS.
224	Mycetophagus atomarius	Boleti		Marsh. 141. sp. 7.
	similis	———		—— 140. sp. 4.
	rufus	———		—— 139. sp. 2.
225	Latridius transversus	Hedges	3to5,	—— 109. sp. 10.
	ruficollis	Sandy places	4,	—— 111. sp. 17.
	rugicollis	———	4,	—— 113. sp. 23.
	impressus	———	4,	—— 110. sp. 11.
226	Silvanus frumentarius	Damp cellars	10,11,	Page 208.
241	Cassida maculata	Elecampane, sides of ditches, Plaistow		Marsh. 147. sp. 9.
	nebulosa	Elecampane, Plaistow marsh		—— 145. sp. 6.
251*	Triplax russica	Dead trees and fungi		Page 214.
	rufipes	Dead trees		Gyll. i. 207. sp. 4.
252	Phalacrus bicolor	Flowers	9,	Ill. K. P. i. 80. sp. 13.
	corticalis	———	9,	—— 79. sp. 11.
	millefolii	———	9,	
	caricis	———	9,	
	æneus	———	9,	
	coruscus	———	9,	—— 79. sp. 10.
	consimilis	———	9,	Marsh. 75. sp. 46.
	geminus	———	9,	
254	Coccinella mutabilis	Hedges	9,	Ill. K. P. i. 426. sp. 15.
258	Forficula borealis	Scotland		
264	Locusta flavipes	Marshes, Hackney & Bermonds.	9,	Don. Brit. Ins.
311	Papilio Machaon B. *The Swallow-tail*	Meadows	5,	Page 235.
312	Gonepteryx Rhamni *The Brimstone*	Woods	6,7,	—— 236.
313	Colias Hyale M. *The clouded Yellow*	Meadows	6,	—— —
	Edusa M. *The pale clouded Yellow*	———		—— —

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No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
314	Pontia Brassica	M.	Gardens	5,	Page 236.
	The large White				
	Rapæ	M.	Gardens	5,	—— —
	The green-veined White				
	Sinapis	B.	Woods	5,	—— 237
	The wood White				
317	Vanessa Atalanta	B.	Lanes in woods and open pl.		—— 238.
	The red Admiral				
	Antiopa	B.	Woods		—— —
	The white Bordered				
	Urticæ	*l.* M.	Nettles		Haw. 26.
	The small Tortoiseshell				
	C. album	*l.* M.	Nettle, hop, willow & currant	6,	Page 238.
	The white C				
320	HipparchiaPamphilus	*l.* B.	Crested dog's-tail grass	5,	Haw. 17.
	The small Heath				
	Megæra	*l.* B.	Grassy banks	5,	Haw. 22.
	The Wall				
	Megæra	B.	Moist places and lanes	7,	Page 240.
	The Wall				
	Ægeria	B.	Borders of woods and fields	4,6,	—— 241.
	The speckled Wood				
321	Thecla Betulæ	M.	Birch woods		—— —
	The brown Hair-streak				
322	Lycæna Chryseis		Marshy places		—— —
	The purple-edged Copper				
	Virgaureæ	E.	——		—— —
	The middle Copper				
	Adonis	B.	Chalky places	5,	—— —
	The Clifden Blue				
	Phlæas	B.	Grassy commons	4,6,	—— —
	The common Copper				
	Argiolus	E.	Meadows	5,	—— 242.
	The Azure Blue				
	Dorylas	E.	Heaths and commons	5,	—— —
	The common Blue				
323	Hesperia Comma	E.	Chalky places near Lewes		—— —
	The pearl Skipper				
324	Smerinthus ocellatus	*l.* E.	†Sallow, apple-trees		Haw. 64.
	The eyed Hawkmoth				
	Tiliæ	*l.* M.	Lime and elm-trees		—— —
	The lime Hawkmoth				
	Populi	*l.* E.	Trunks of poplars		Page 242.
	The poplar Hawk				
325	Sphinx Elpenor	*l.* M.	†Ladies bed-straw, marshes		Haw. 62.
	The elephant Hawkmoth				
	Celerio	B.	Gardens, & Wisb. (Dr. Skrimshire)		—— 61.
	The sharp winged Hawk				

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No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
325	Sphinx Ligustri *l.*	Privet hedges		Haw. 59.
	The privet Hawk			
326	MacroglossaStellatarum E.	Bedstraw		—— 66.
	The Humming-bird			
331	Hepialus lupulinus	Banks of gross weeds		—— 141. sp. 2.
	The orange Swift			
334	Saturnia Pavonia-minor B.	Osier beds	5,	Page 246.
	The Emperor			
335	*Liparis* Monacha E.	Trunks of oaks	6,	—— —
	The black Arches			
	dispar B.	Willows		—— —
	The Gipsy			
339	Lasiocampa Neustria M.	Gardens		Haw. 129. sp. 87.
	The barred-tree Lackey			
	castrensa B.			—— — ——
	The ground Lackey			
342	Stauropus Fagi *l.*	*Oak, birchwood, Darent	9,	—— 85. sp. 9.
	The Lobster Moth			
343	Notodonta Ziczac *l.* B.	Willows and poplars		—— 99. sp. 26.
	The pebble Prominent			
	camelina B.	Oaks in woods	5,	—— 98. sp. 21.
	The coxcomb Prominent			
	trepida B.	Poplars		Donov. B. I. 239.
	The swallow Prominent			
345	Cerura Vinula *l.*	†Willows and poplars	9,	Haw. 86. sp. 10.
	The Puss			
346	Arctia papyritia *l.*	*Water plants		—— 111. sp. 48.
	The water Ermine			
	lubricipeda *l.*	Various plants		—— 110. sp. 47.
	The buff Ermine			
	phæorrhæa B.	Hedges		Page 248.
	The brown Tail			
	V nigra M.	Lime-trees, Darent		Haw. 107. sp. 41.
	The black V			
347	Callimorpha Jacobeæ *l.*	Ragwort		—— 150. sp. 12.
	The Cinnabar			
348	Lithosia lutarella	Woods		—— 148. sp. 7.
	The four-spot Yellow-footman			
	complana B.	Skirts of woods		—— 147. sp. 3.
	The common Footman			
	griseola ——			—— — sp. 2.
	The dun Footman			
	flava E.	Woods		—— — sp. 4.
	The straw-coloured Footman			
	Bombyx cæruleocephala M.	Bushy places		—— 104. sp. 39.
	The figure of 8			
	antiqua *l.*	Oaks		—— 132. sp. 92.
	The Vapourer			

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No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
	Bombyx gonostigmata	B.	Woods	7,	Haw. 132. sp. 93.
	The scarce Vapourer				6.
	Nudaria munda	B.	Hedges in lanes, Gravesend		—— 15 sp. 1.
	The Muslin				
	Apoda Testudo	*l.*	Oaks		—— 137. sp. 1.
	The Festoon				
349	Yponomenta Evonymella		Hedges	6,	—— 512. sp. 1.
	sequella	M.	———		—— Prodr.
	plumbella		———		
354	*Noctua* fimbria	M.	Oaks	6,	—— 161.
	The broad Border				
	orbona	B.	Gardens		—— —
	The lesser yellow Underwing				
	subsequa	B.	———		—— —
	The lunar yellow Underwing				
	cytherea		Skirts of woods	5,	—— —
	The straw Underwing				
	Janthina	M.	Woods		—— 162.
	The lesser Broad border				
	pyramidea	B.	Oaks		—— 163.
	The copper Underwing				
	Typhæ	M.	Near bullrushes		—— 173.
	The Bullrush				
	nervosa	F.	Weedy banks		—— 176.
	The tawny-veined Wainscot				
	pygmina		Skirts of woods		—— —
	The small Wainscot				
	Chi	E.	Old walls, Derbysh. (Mr. J. Chant)		—— 183.
	The Chi Moth				
	Brassicæ		Pales	6,7,	—— 191.
	The cabbage Moth				
	unca		———		—— 194
	The flounced Rustic				
	lunato-strigata		Hedges		—— —
	The lesser flounced Rustic				
	X notata		———		—— —
	The tawny X				
	præcox	F.	Skirts of woods		—— 201.
	The Portland Moth				
	perla		Old walls, Greenwich		—— 203.
	The marbled Beauty				
	tetragona		Hedges		—— 205.
	The square-spot Rustic				
	furca	B.	Weedy banks		—— 209.
	The flame Furbelow				
	rava	B.	———		—— —
	The Russet				
	I. niger		———		—— 211.
	The letter I.				

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AUGUST.

No. of Gen.	Name.		Where found.	Other times of ap.	Reference to description.
354	*Noctua* oculea *The common Rustic*	B.	Gardens and banks		Haw. 211.
	lugens *The rustic Mourner*	B.	Weedy banks		—— 212.
	minima *The least Minor*	M.	Open parts in woods		—— 216.
	crassa *The stout Dart*	M.	Gardens		—— 220.
	radia *The shuttle-shaped Dart*	B.	Grassy places and tr. of trees		—— 223.
	baja *The dotted Clay*	B.	Skirts of woods		—— 224.
	brunnea *The purple Clay*	B.	——		—— 225.
	Sigma *The double Square-spot*	B.	——		—— —
	umbrosa *The 6-striped Rustic*	M.	——		—— 228. sp. 198.
	aurago *The barred Sallow*	E.	Open places in woods		—— 235.
	citrago *The orange Sallow*	B.	Trunks of limes		—— 238.
	auricula *The golden Ear*	B.	Skirts of woods		—— 240.
	libatrix *The Herald*	E.	Poplars and pales	4,	—— 244.
	derasa *The buff Arches*	B.	Skirts of woods		—— —
	trapetzina *The Dunbar*		——		—— 246.
	Pyralina *The lunar-spotted Pinion*	M.	CoombeWood, (Mr. J. Chant)		—— 247.
	diffinis *The white-spotted Pinion*	M.	Trunks of trees		—— —
	Festucæ *The gold Spot*	E.	Meadows		—— 254. sp. 1.
	lusoria *The black Neck*	M.	Moist woods		—— 259. sp. 11.
	ænea *The small Purple-barred*	E.	Heaths		—— 266. sp. 34.
	nupta *The red Underwing*	B.	Trunks of willows		—— 268. sp. 2.
	Geometra conversaria *The large Carpet*		WarleyWood, Devon, (Dr.Leach)		—— 302. sp. 87.
	unidentaria *The dark-barred Usher*	B.	Skirts of woods	6,	—— 308. sp. 101.
	gilvaria *The straw Belle*		Clover-fi., Dover,(Mr.Steph.)		—— 287. sp. 42.

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	Geometra elinguaria	M.	Skirts of woods		Haw. 291. sp. 54.
	The scolloped Oak				
	Alniaria	E.	Lime-trees		—— 294. sp. 62.
	The canary shouldered Thorn				
	Quercinaria	——			—— —— sp. 64.
	The plain August Thorn				
	Tiliaria	——			—— —— sp. 63.
	The freckle August Thorn				
	angularia	——			—— —— sp. 65.
	The clouded August Thorn				
	olivaria	E.	Birch-trees, Kent		—— 304. sp. 91.
	The beech green Carpet				
	pullaria		Heaths, Wales and Devonsh.		—— 314. sp. 115.
	The brown Annulet				
	prunata	B.	Skirts of woods and gardens		—— 322. sp. 19.
	The Phœnix				
	degenerata	B.	Kent		—— 333. sp. 51.
	The degenerate Carpet				
	unifasciata	B.	Open places in woods		—— 335. sp. 57.
	The single barred Rivulet				
	albulata	B.	Pastures		—— 336. sp. 61.
	The grass Rivulet				
	dilutata	E.	Hedges		—— 353. sp. 117.
	The small fanfoot Wave				
*	incanata		Mullein		—— 350. sp. 104.
	The mullein Wave				
	lignata	E.	Marshy places		—— 340. sp. 73.
	The oblique Carpet				
	dimidiata	E.	Hedges		—— 347. sp. 97.
	The small Scollop				
	liturata		Shady groves near Westerham,		—— 346. sp. 92.
	The tawny barred Angle		Kent		
	subfulvata	M.	Skirts of woods		—— 357. sp. 129.
	The tawny Speck				
	Cratægaria	B.	Hedges and woods	4,6,	—— 298. sp. 74.
	The Brimstone				
*	*fimbriata*		Trunks of trees		—— 320. sp. 12.
	The bordered November				
	subtristata	B.	Woods and hedges	5,	—— 332. sp. 50.
	The common Carpet				
	trigonata	B.	Hedges, Kent		—— 338. sp. 68.
	The small blue Border				
	sexalisata	B.	Open places in woods, Kent		—— 356. sp. 126.
	The small Seraphim				
361	rubiginata	E.	Pathways in woods	6,	—— 338. sp. 67.
	The blue bordered Carpet				
	adustata	E.	Hedges	6,	—— 337. sp. 65.
	The scorched Carpet				
	ocellata	E.	Open paths in woods	6,	—— 331. sp. 46.
	The purple Bar				

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	Geometra centum-notata	Open paths in woods	5,	Haw. 324. sp. 24.
	The marbled Carpet			
	comma notata	——	5,	—— 325. sp. 26.
	The yellow-marbled Carpet			
	omicronaria E.	Woods, Kent	5,	—— 312. sp. 110.
	The Mocha			
	ocellaria E.	Woods	5,	—— — sp. 111.
	The false Mocha			
	pendularia E.	Birch-trees, Coombe	5,	—— 311. sp. 108.
	The birch Mocha			
	punctaria	Open places in woods	5,	—— 312. sp. 112.
	The maiden's Blush			
	Chenopodaria E.	Bushy places	6,	—— 302. sp. 88.
	The small Mallow			
	dubitata M.	Hedges and gardens	5,	—— 318. sp. 7.
	The Tissue			
	angustata B.	Hedges, Kent		—— 362. sp. 145.
	The narrow winged Pug			
	lævigata B.	Juniper trees & gardens, Norf.		—— — sp. 148.
	The Juniper Pug			
	Herminia dimidiata B.	Tea wharehouses, E. I. House		—— 372. sp. 19.
	The tea Tabby			
362	proboscidalis E.	Hedges	6,	—— 365. sp. 1.
	The Snout			
363	Platypteryx flexula B.	Pathways in woods		—— 154. sp. 7.
	The beautiful Hooktip			
364	Cilex compressa B.	Hedges	5,	—— 110. sp. 46.
	The goose-egg Moth			
	Tortrix diversana B.	Grassy banks		—— 397. sp. 7.
	The crossed Straw			
	Zoëgana B.	——		—— 398. sp. 8.
	The Zœgian			
365	hamana B.	——		—— 397. sp. 6.
	The hook-marked Straw			
	caudana	Pathways in woods		—— 409. sp. 46.
	The shallow Notchwing			
	affractana	——		—— 408. sp. 45.
	The common Notchwing			
	excavana	——		—— — sp. 44.
	The iron Notchwing			
	emargana	——		—— 408. sp. 43.
	The chequered Notchwing			
	literana	Oaks	9,	—— 411. sp. 53.
	The black-sprigged Green			
	squamana	——		—— 410. sp. 52.
	The scaly Green			
*	Desfontiana	Pathways in woods		—— 413. sp. 62.
	The Desfontianian			
*	umbrana	——		—— 411. sp. 55.
	The dark-streaked Button			

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365	*Tortrix* rufana E.	Hedges, Yorkshire		Haw. 417. sp. 74.
	The red Triangle			
	Forskäliana E.	Hedges		—— 420. sp. 83.
	The Forskälian			
	Bergmanniana	Gardens		—— 404. sp. 32.
	The Bergmannian			
	Holmiana E.	Hedges in chalky places		—— 427. sp. 103.
	The Holmian			
	costana	Open places in woods		—— 423. sp. 91.
	The straw oblique Bar			
	Solandriana	——		—— 449. sp. 175.
	The Solandrian			
	Salicana M.	Willows		—— 430. sp. 111.
	The White-backed			
	Quercana E.	Paths in woods and gardens		—— 399. sp. 12.
	The Long-horned			
	straminea E.	Pastures		—— 401. sp. 18.
	The short-barred Straw			
	Ilicana B.	Thick woods		—— 407. sp. 40.
	The large Holly			
	asperana B.	Hedges		—— 414. sp. 66.
	The White-shouldered			
	Schalleriana E.	Woods		—— 416. sp. 73.
	The Schallerian			
	semifasciana E.	Hedges, Kent		—— 431. sp. 115.
	The short-barred Grey			
	Betuletana M.	Birch-trees, Coombe Wood		—— 432. sp. 119.
	The birch Long-cloak			
	trapezana	Birch		—— 441. sp. 150.
	The testaceous Diamond-back			
	rusticana E.	Hedges		—— 442. sp. 154.
	The tawny Blotch-back			
*	sticticana	——		—— — sp. 155.
	The brown Blotch-back			
	Rubiana	Open parts in woods		—— 450. sp. 178.
	The blotch-backed Grey			
	cinereana E.	Moss on trees		—— 451. sp. 183.
	The mottled Grey			
	nigricana	Hedges		—— 458. sp. 202.
	The black-striped Edge			
	Botys hybridalis	Chelsea		—— 386. sp. 32.
	The rush Veneer			
	tetragonalis	Hedges, Dover, Coombe		—— 385. sp. 30.
	The diamond Spot			
370	Galeria alvearia	Bee-hives		—— 392. sp. 2.
	The Honey-moth			
	cerea	——		—— — sp. 1.
	The honey-comb Moth			

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AUGUST.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
371	*Crambus* pascuea	Pastures		Haw. 488. sp. 25.
	The inlaid Veneer			
	falsa	Meadows		—— 488. sp. 27.
	The chequered Veneer			
	striga	Epping Forest		—— 490. sp. 33.
	The small straw-coloured Veneer			
	sanguinea	Grassy places near chalk	5,	—— 484. sp. 11.
	The buff-edged rosy Veneer			
	Tinea applana E.	Hedges, Kent	11,	—— 510. sp. 17.
	The common Flat body			
387	Lestes autumnalis	Marshy places		Page 259.
466	Colletes succincta	Gardens		Kirby ii. 32. sp 1
467	Dasypoda plumipes	Sandy banks		Page 280.
468	Andrena cingulata ♂	Flowers of the Ranunculi		Kirby ii. 88. sp. 41.
	Schrankella	Flowers	9,	—— 90. sp. 42.
	Trimmerana M.	———		—— 116. sp. 57
	tridentata	———?		—— 132. sp. 71.
476	Stelis phæoptera	———?		—— 232. sp. 40.
478	Osmia spinulosa	Sandy and chalky places		—— 261. sp. 53.
	Leaiana	Thistles		—— 263. sp. 54.
479	Megachile centuncularis	———		—— 237. sp. 42.
481	Nomada lineola	Umbelliferous plants		—— 194. sp. 14.
	Jacobææ	Ragwort	9,	—— 201. sp. 20.
487	Bombus sylvarum	Flowers	9,	—— 326. sp. 82.
	fragrans	———	9,	—— 329. sp. 83.
	Latreillilla	Thistles	9,	—— 330. sp. 84.
	lucorum	Flowers in gardens	9,	—— 337. sp. 89.
	Albinella	Flowers	9,	—— 361. sp. 104.
490	Corethra culiciformis	Marshy places	9,	Page 290.
491	Tanypus cinctus	———	9,	—— —
492	Chironomus plumosus	———	9,	—— —
493	Psychoda phalænoides	Moist places	9,	—— —
494	Cecidomyia lutea	———	9,	—— 291.
495	Ctenophora atrata	Marshy places	9,	—— —
496	Pedicia rivosa	Marshes	9,	—— —
497	Tipula oleracea	Meadows	9,	—— —
506	Tabanus *autumnalis*	———		Stewart ii. 267.
555	Œstrus Bovis M.	Cattle on commons		Clark 44.
556	Gasterophilus Equi	Horses on commons		—— 20.
	Hemorrhoidalis	Cattle on commons		—— 29.
558	Ornithomyia avicularia	Black grouse and tit-pippit		Page 303.

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SEPTEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
15	Leistus Raulinsii	River side, Battersea, (Mr. Stephens)	5,	N. S.
	cæruleus	Under stones	5,6,	Page 147.
37	Amara ærata	Corn-fields, Hertford, (Mr. Stephens)		
55	Pælobius Hermanni	Ponds	10,11,12,	Page 157.
96	Cryptophagus phæorrhæus	Under bark and damp wood	10,11,12,	
	ruficollis	———	10,11,12,	
100	Ips 4-pustulatus	——— of the stumps of trees, Bexley		Page 170.
115	Aleochara cinnamonea	Fungi and dead trees	10,11,	Gyll.ii.412.sp.54.
192	Melöe autumnalis	Margate, (Mr. Milne)		Leach T. L. S. xi.
	glabratus	——— ? (Rev. W. Kirby)		——— ———
254	Coccinella 12-punctata	Banks		Illig.K.P.i.466.sp.36
	16-guttata	Bristol		—— 435. sp. 23.
	globosa	Banks	10,	
	5-punctata	Hedges and Battersea-fields	6,	—— 469. sp. 39.
	22-punctata	Hedges		—— 441. sp. 28.
	13-punctata	———		
	19-punctata	———		—— 468. sp. 37.
155	Chilocorus 4-verrucatus	Fir	6,	—— 473. sp. 41.
	bipustulatus	Oaks	6,	—— 475. sp. 43.
	Cacti	White-thorn		Page 215.
263	Conocephalus viridissimus	Marshes		—— 218. [32.
	verrucivorus	———, Rochester		Fabr. E.S. ii.62. sp.
265	Gomphocerus rufus	Sloping banks, Battersea		Page 219.
269	Ælia acuminata	Grassy places		Fab.E.S.ii.126. sp.
	melanocephala	———		Page 221. [179.
273	Berytus tipularius	———	6,	—— 222.
277	Myodocha tipuloides		6,	—— 223.
300	Membracis Genistæ	——— ? Commons		Stewart ii. 96.
311	Papilio Machaon *l.*	Umbelliferous plants	7,	—— 235.
	The Swallow-tail			
317	Vanessa Urticæ B.	Lanes, &c.	6,	—— 238.
	The small Tortoiseshell			
	C. album	Skirts of woods	7,	—— —
	The white C			
320	Hipparchia Pamphilus B.	Grassy commons	6,	—— 240.
	The small Heath			
324	Smerinthus Populi *l.* M.	Poplars		Haw. 64.
	The poplar Hawk			
325	Sphinx Convolvuli E.	Gardens and palings		Page 244.
	The convolvulus Hawkmoth			
	Atropos *l.* E.	Potato blossoms		Haw. 56.
	The Death's Head			
326	Macroglossum Stellatarum. E.	Gardens	4.6,	Page 244.
	The Humming-bird			
339	Lasiocampa Cratægi B.	Woods, Bedfordshire		Haw. 105. sp. 37.
	The oak Eggar			

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SEPTEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
343	Notodonta tritopha *l.*	Oaks		Haw. 98. sp. 24.
	The great Prominent			
	dromedaria *l.*	———		—— 100. sp. 28.
	The iron Prominent			
	palpina *l.* E.	Poplars	5,	—— 98. sp. 20.
	The pale Prominent			
	palpina B.	Willows in hedges	6,	—— —— ——
	The pale Prominent			
	Camelina *l.* E.	Oaks	5,	—— —— sp. 21.
	The coxcomb Prominent			
	Trepida *l.*	Poplar		Don. B. I. 239. 1.
	The swallow Prominent			
344	*Pygæra* bucephala *l.* M.	†Lime, oak, sallows		Haw. 93. sp. 15.
	The buff Tip			
	Clostera curtula *l.* E.	Poplar		—— 130. sp. 89.
	The chocolate Tip			
	reclusa *l.* E.	———		—— 131. sp. 91.
	The small chocolate Tip			
345	Cerura Furcula *l.*	———?		—— 103.
	The Kitten			
348	Lithosia pulchella E.	Near Christ-ch. Hants, (Mr. Dale)		—— 150. sp. 11.
	The crimson Speckled			
	Bombyx Roboris *l.* M.	Birch and nut-tree		—— 104. sp. 35.
	The lunar marbled Brown			
	Cassinea M.	Pales and trunks of trees		—— 106. sp. 40.
	The Sprawler			
	Coryli *l.* M.	Nut-trees	5,	—— 102. sp. 32.
	The nut-tree Tussock			
	antiqua	Gardens		—— 132. sp. 92.
	The Vapourer			
	Noctua Tragopoginis M.	Gardens		—— 164.
	The Mouse			
	geminipuncta	Marshy places		—— 176.
	The twin-spot Wainscot			
	leporina *l.*	Birch		—— 182.
	The Miller			
	flavocincta E.	Garden pales		—— 183.
	The large Ranunculus			
	catæna M.	Trunks of trees?		Sow. B.M.29. t.14.
	The Brixton Beauty			
	Atriplicis	Gardens and hedges	6,	Haw. 197.
	The arrach Moth			
	Oxyacanthæ E.	Hedges		—— 201.
	The green-brindled Crescent			
	rufuncula	———		—— 216.
	The plain red Minor			
	margaritosa E.	Weedy banks		—— 28.
	The pearly Underwing			

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SEPTEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua majuscula*	Weedy banks		Haw. 218.
	The pearly Underwing, var.			
	plecta B.	———	6,	—— 226.
	The flame Shoulder			
	satellitia E.	Skirts of woods		—— 229.
	The Satellite			
	helvola M.	———		—— ——
	The flounced Chesnut			
	lunosa	Woods, Coombe		—— 230.
	The lunar Underwing			
	sphærulatina E.	Skirts of woods		—— ——
	The bearded Chesnut			
	pistacina	———		—— 231.
	The pale bearded Chesnut			
	lineola	———		—— ——
	The dark bearded Chesnut			
	ferrea	———		—— ——
	The iron Chesnut			
	venosa	———		—— 232.
	The veiny Chesnut			
	litura E.	———		—— ——
	The brown-spot Pinion			
	Vaccinii M.	———		—— 233.
	The Chesnut			
	polita	———		—— ——
	The netted Chesnut			
	spadicea M.	———		—— ——
	The dark Chesnut			
	subnigra	———		—— 234.
	The black Chesnut			
	flavago E.	Open places in woods		—— 236.
	The pink-barred Sallow			
	fulvago E.	———		—— ——
	The common Sallow			
	gilvago E.	———		—— 237.
	The lemon Sallow			
	macilenta	Elms		—— 239.
	The brick Moth			
	erythrostigma	Margate		—— 240.
	The red Dot			
	ochraceago M.	Pl. where burdock abounds		—— 234.
	The frosted Orange			
	Lota	Trunks of trees		—— 242.
	The red line Quaker			
	meticulosa	Pales	5,6,	—— 244.
	The angle Shades			
	trilinea B.	Thickets	6,	—— 249.
	The equal Treble-lines			

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SEPTEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
354	*Noctua approximans*	Thickets		Haw. 249.
	The equal Treble-lines, var. *semifuscans*	———		——
	The equal Treble-lines, var.			
	Geometra erosaria B.	Lime-trees		—— 293. sp. 61.
	The September Thorn Carpinaria	Thickets		—— 295. sp. 66.
	The flounced Thorn miatu E.	Pales		—— 328. sp. 37.
	The autumn Green Carpet Juniperata	Fir woods		Linn. S.N. ii. 871.
	simulata	———		
	ericetaria	Cobham and Hants		Haw. 278. sp. 20.
	The bordered Grey plagiata B.	Bushy places	6,	—— 318. sp. 8.
	The slender Treble-bar remutata B.	Shady groves		—— 349. sp. 102.
	The false Ribband-wave aversata B.	———	7,	—— —— sp. 101.
	The Ribband-wave			
363	Platypteryx lacertianaria *l.* E.	Birch		—— 153. sp. 5.
	The scalloped Hooktip			
365	*Tortrix* tripunctana	Pathways in woods		—— 417. sp. 75.
	The rusty Treble-spot contaminana B.	Hedges		—— 419. sp. 80.
	The chequered Pebble ciliana	Woods	10,	—— —— sp. 79.
	The White-fringed rombana	———	19,	—— 418. sp. 78.
	The dark Chequered literana	Oaks	8,	—— 411. sp. 53.
	The black-sprigged Green Mylleri	Nettles and thistles		—— 472. sp. 5.
	Millers Nettle-tap tricolorana E.	Oaks		—— 411. sp. 54.
	The tri-coloured Green latifasciana	Hedges, Yorkshire		—— 414. sp. 65.
	The broad-barred gnomana	Open places in woods	10,	—— 417. sp. 76.
	The Dial bifidana	———	10,	—— 418. sp. 77.
	The Fork-barred incarnana M.	Heaths		—— 435. sp. 128.
	The marbled Short-cloak maculana E.	Skirts of woods		—— 440. sp. 145.
	The black Double-blotched piceana	Heaths, Surry		—— —— sp. 147.
	The shining Pitch populana	Nettles		—— 447. sp. 167.
	The pigmy Y			

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SEPTEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Tortrix Oxyacanthæ	Flowers	10,	Haw. 471. sp. 2.
	The Autumn Nettle-tap			
468	Andrena Shawella	——— ?		Kirby ii. 160. sp. 100
*	minutula	———		—— 161. sp. 101.
472	Panurgus ursina	Heaths		—— 178. sp. 1.
	Linneella	———		—— 179. sp. 2.
476	Stelis punctatissima	Flowers ?		—— 231. sp. 39.
479	Megachile ligniseca	Oaks, &c.		—— 242. sp. 44.
481	Nomada varia	Sunny banks ?		—— 185. sp. 7.
	flavopicta	Ragwort		—— 202. sp. 21.
	Solidaginis	Heaths		—— 204. sp. 22.
	picta	Flowers and banks		—— 206. sp. 23.
538	Stomoxys calcitrans	Cattle on commons		Page 298.
	irritans	———		Stewart ii. 271.
544	Scatophaga merdaria	Cow dung		Page 300.

OCTOBER.

20	Bembidium Spencii	Grassy banks	10,12,	N. S.
36	Sphodrus collaris	Roots of trees, Epping Forest	1to4,	Marsh. 443. sp. 29.
91	Scaphisoma Agaricinum	Boletus versicolor and fungi	10,	Page 168.
104	Staphylinus olens	Roots of trees	4,	Gyll. ii. 285. sp. 6.
114	Aleochara impressa	Fungi and decayed trees in woods	11,12,	—— 381. sp. 4.
224	Mycetophagus undulatus	Boleti		Marsh. 140. sp. 6.
325	Sphinx Atropos E.	Gardens		Page 244.
	The Death's Head			
328	Ægeria crabroniformis *l.*	Trunks of willows		Haw. 69.
	The lunar Hornet			
	**Lithosia* grammicus M.	Wales, (Mr. Donovan)		—— 134. sp. 97.
	The feathered Footman			
354	*Noctua* exoleta M.	Gardens	5,	—— 168.
	The large Sword-grass			
	Lambda E.	Shady pales		—— 181.
	The grey Shoulder-knot			
	seladonia M.	Skirts of woods	4,	—— 199.
	The Brindled Green			
	aprilina M.	———	4,	—— 200.
	The Marvel du Jour			
	Geometra connectaria M.	Palings and trunks of trees		—— 285. sp. 38.
	The connecting Umber			
	prosapiaria E.	Trunks of trees		—— — sp. 37.
	The scarce Umber			
	defoliaria E.	———		—— 284. sp. 36.
	The mottled Umber			
	clavaria	Mallows		—— 302. sp. 86.
	The Mallow Moth			

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NOVEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
	Geometra pennaria B. *The feathered Thorn*	Woods		Haw. 290. sp. 52.
	psittacata M. *The red Green Carpet*	Trunks of trees		—— 329. sp. 38.
	Spartiata E. *The Streak*	Broom-fields		—— 339. sp. 71.
373	Pterophorus pterodactylus *The common Plume*	Gardens, bushes, woods		—— 475. sp. 3.
	Tortrix examiana *The marbled Chesnut*	Coombe Wood		—— 415. sp. 63.
	Tinea gelatella *The autumnal Dagger*	Trunks of trees		—— 502. sp. 3.

NOVEMBER.

84	*Necrobia* rufipes	CopenhagenFields,(Mr.Gray)	12,	N. S.
	Geometra dilutata B. *The November*	Palings		Haw. 319. sp. 9.
	brumaria E. *The Winter Moth*	Gardens and palings	1,	—— 305. sp. 93.
	Tinea Novembris *The November Dagger*	Trunks of trees, Kensington Gardens		—— 502. sp. 2.
	Phryganea	Coombe Wood		—— 503. sp. 4.
	The drab Day-moth applana E. *The common Flat-body*	Gardens	8,	—— 510. sp. 17.

DECEMBER.

12	Carabus morbillosus	Under bark and wood of willows	1,2,	Page 145.
20	Bembidium properans	Grassy banks?		Marsh.457. sp.34.
	pöecillum	——— ?		Ill.K.P.i.232.sp.17
60	Colymbetes fuliginosus	Ponds, Copenhagen Fields		Gyll. i. 495. sp.28.
83	Opilus mollis	Dry rotten willows	1,2,	Page 166.
89	Phosphuga atrata	Under bark of trees	1,2,	Marsh. 116 sp. 6.
90	Scaphidium 4-maculatum	Fungi and rotten wood		Page 168.
97	Engis humeralis	Bark of trees and boleti	5,6,	Gyll. i. 203. sp. 2.
	rufifrons	———	5,6,	—— 204. sp. 4.
	ferruginea	———	5,6,	—— 212. sp. 4.
99	Nitidula grisea	Under bark of trees		Marsh. 134.sp. 15.
114	Tachyporus chrysomelinus	Roots of grass and moss	1,2,	Gyll. ii. 236. sp. 1.
	pubescens	Under bark and trunks of decayed trees	1,2,3,	—— 243. sp. 8.
127	Anobium tessellatum	Rotten willows	1,2,3,	Page 181.

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DECEMBER.

No. of Gen.	Name.	Where found.	Other times of ap.	Reference to description.
340	Eriogaster Populi B. *The December Moth*	Trunks of trees		Page 247.
354	*Noctua* flavilinea E. *The yellow-line Quaker*	——— ?		Haw. 243.
	Geometra incompletaria E.	———, woods		—— 305. sp. 95.
	The Incomplete apteria E.	———		—— 306. sp. 96.
	Tortrix hyemalis *The Winter Tortrix*	Heaths, Sussex		—— 413. sp. 64.
392	Panorpa hyemalis	Hedges		Panz. 22. 17 ?

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EXPLANATION OF THE PLATES.

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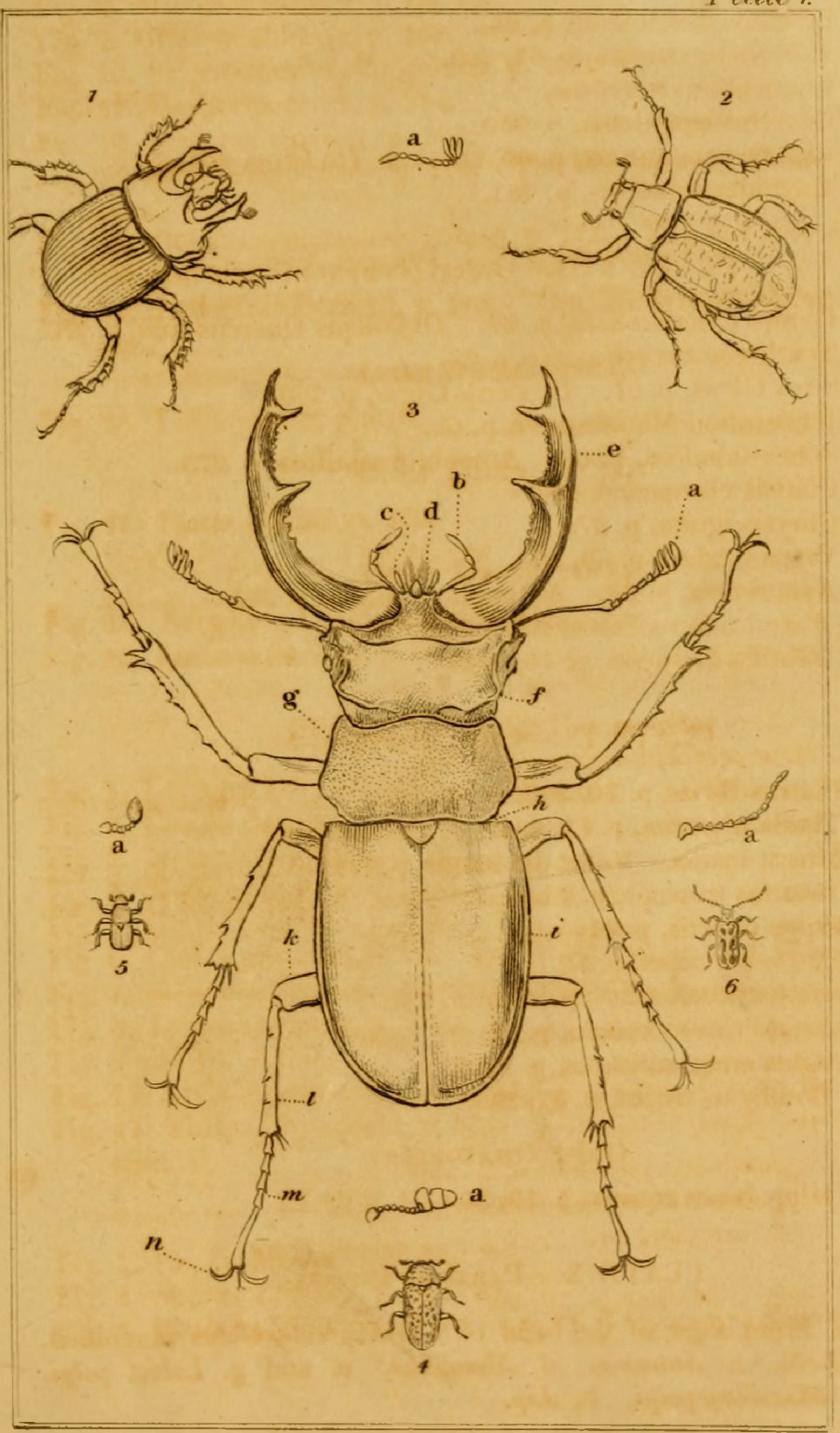

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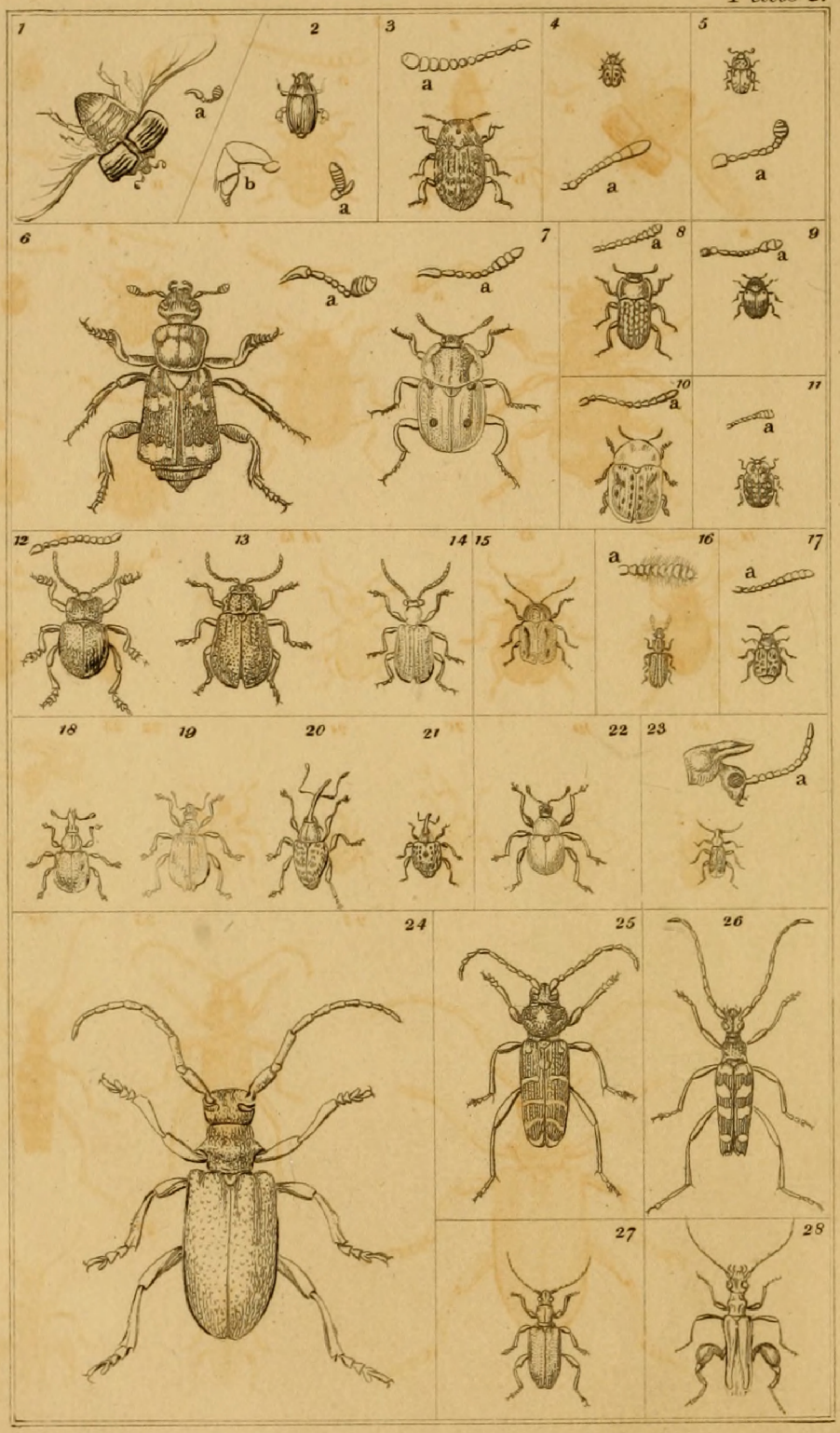

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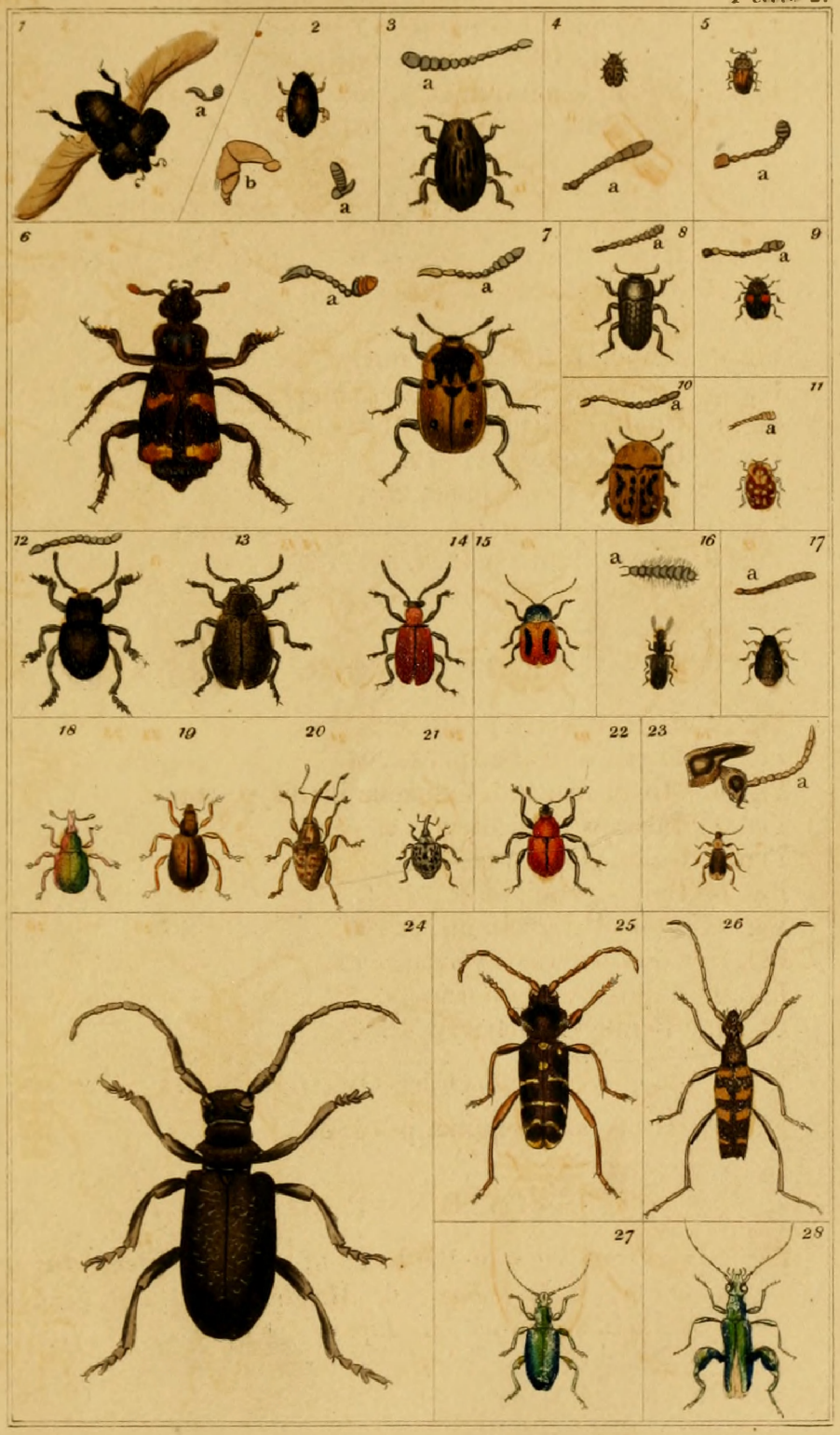

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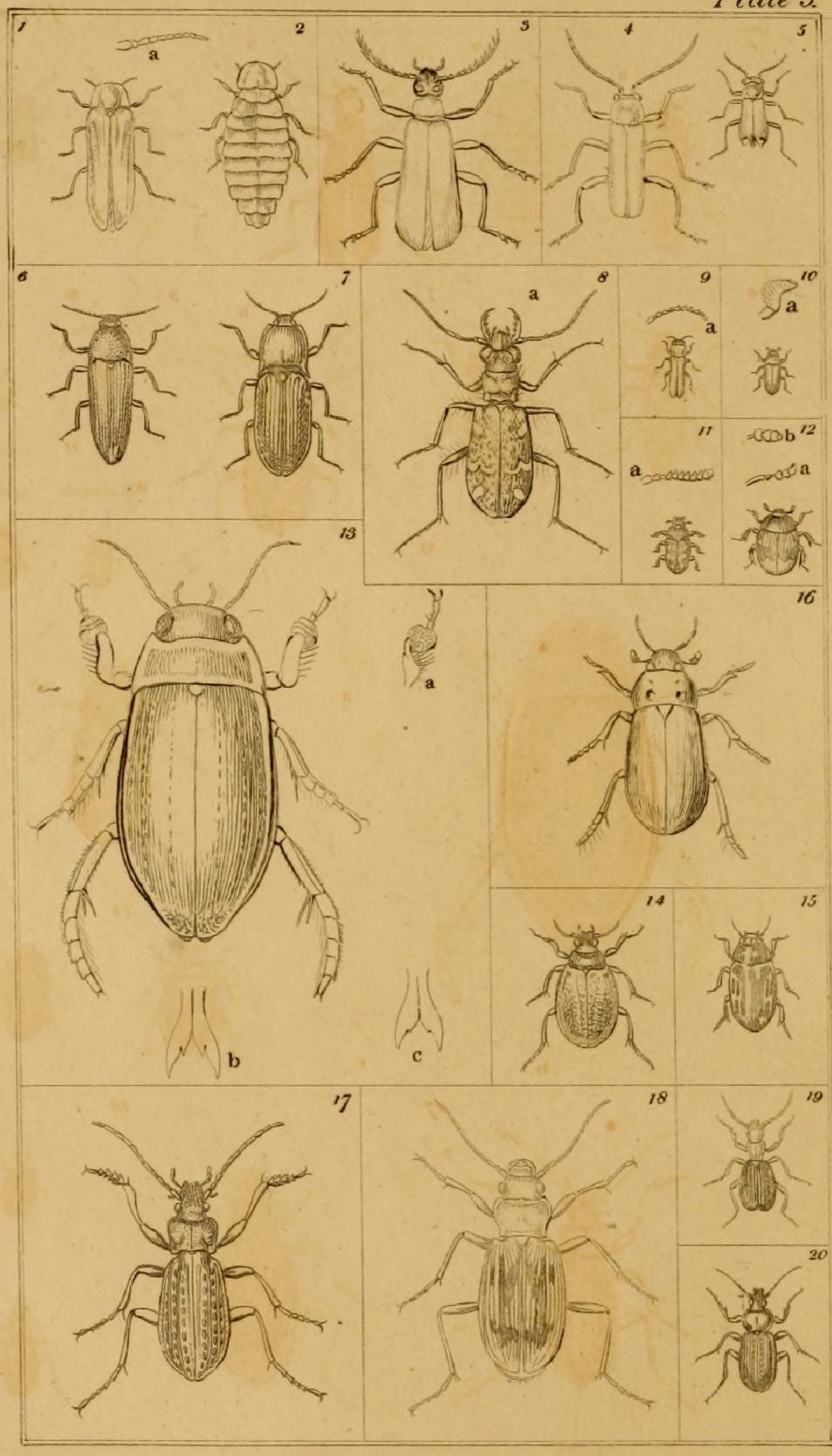

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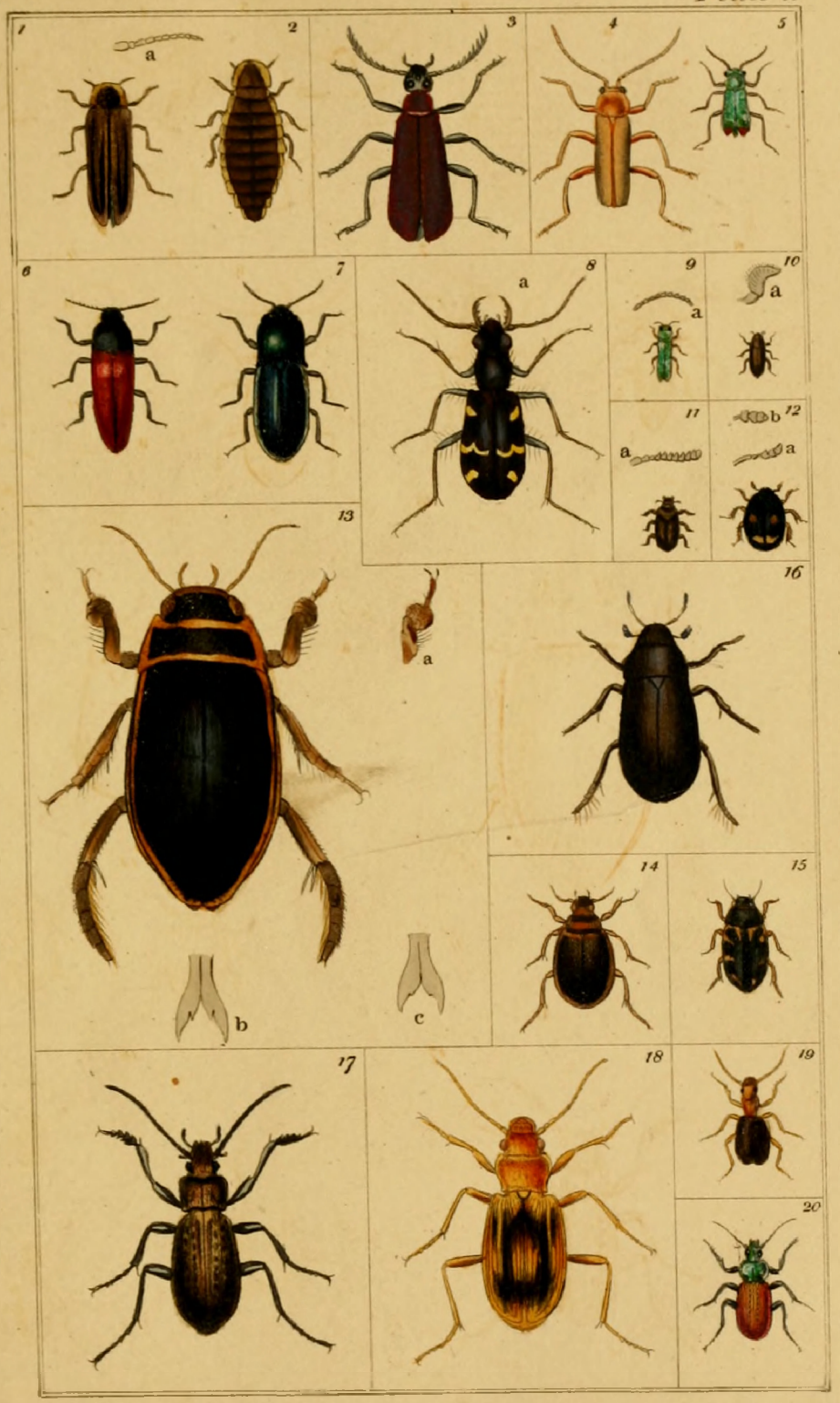

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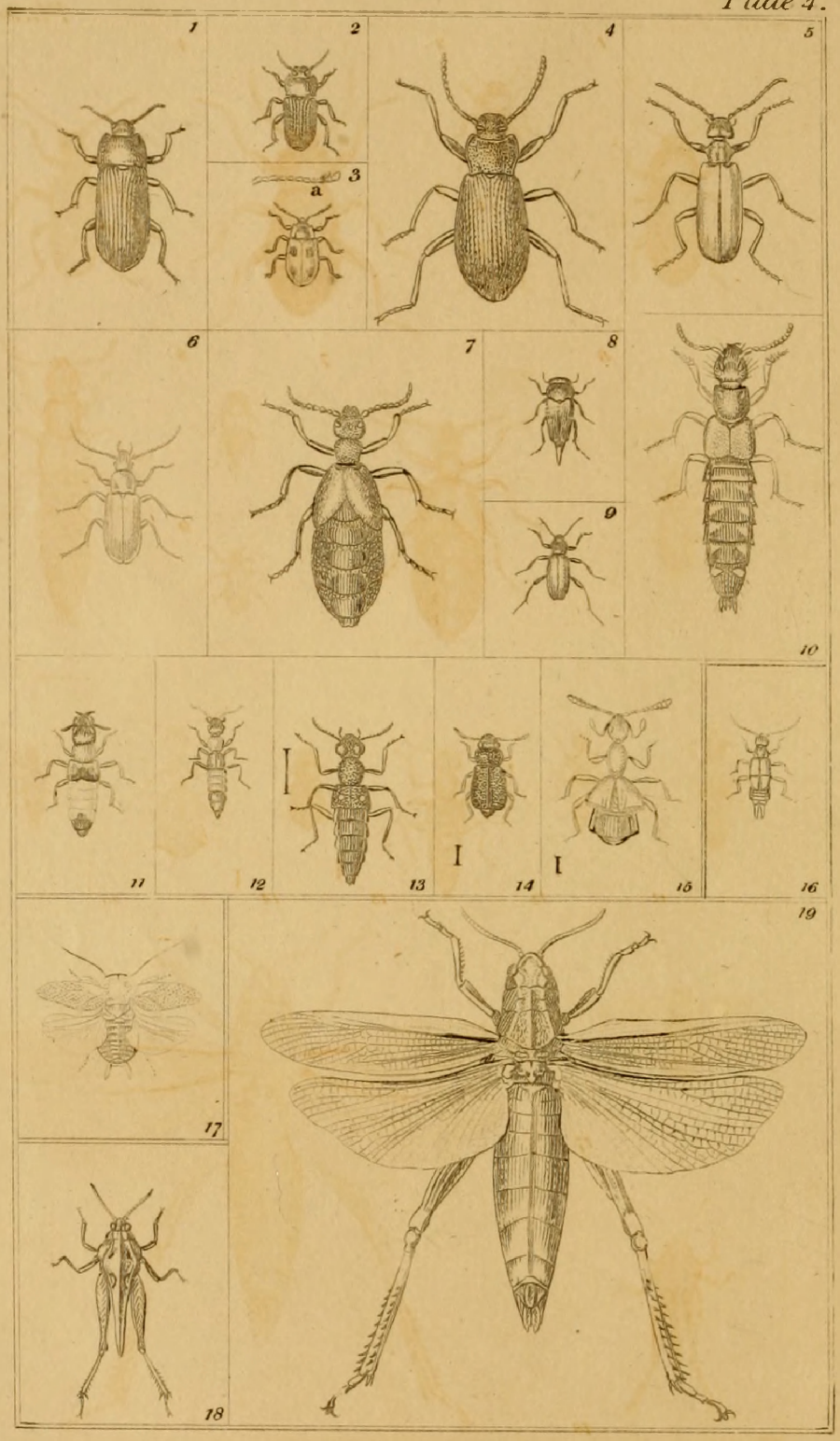

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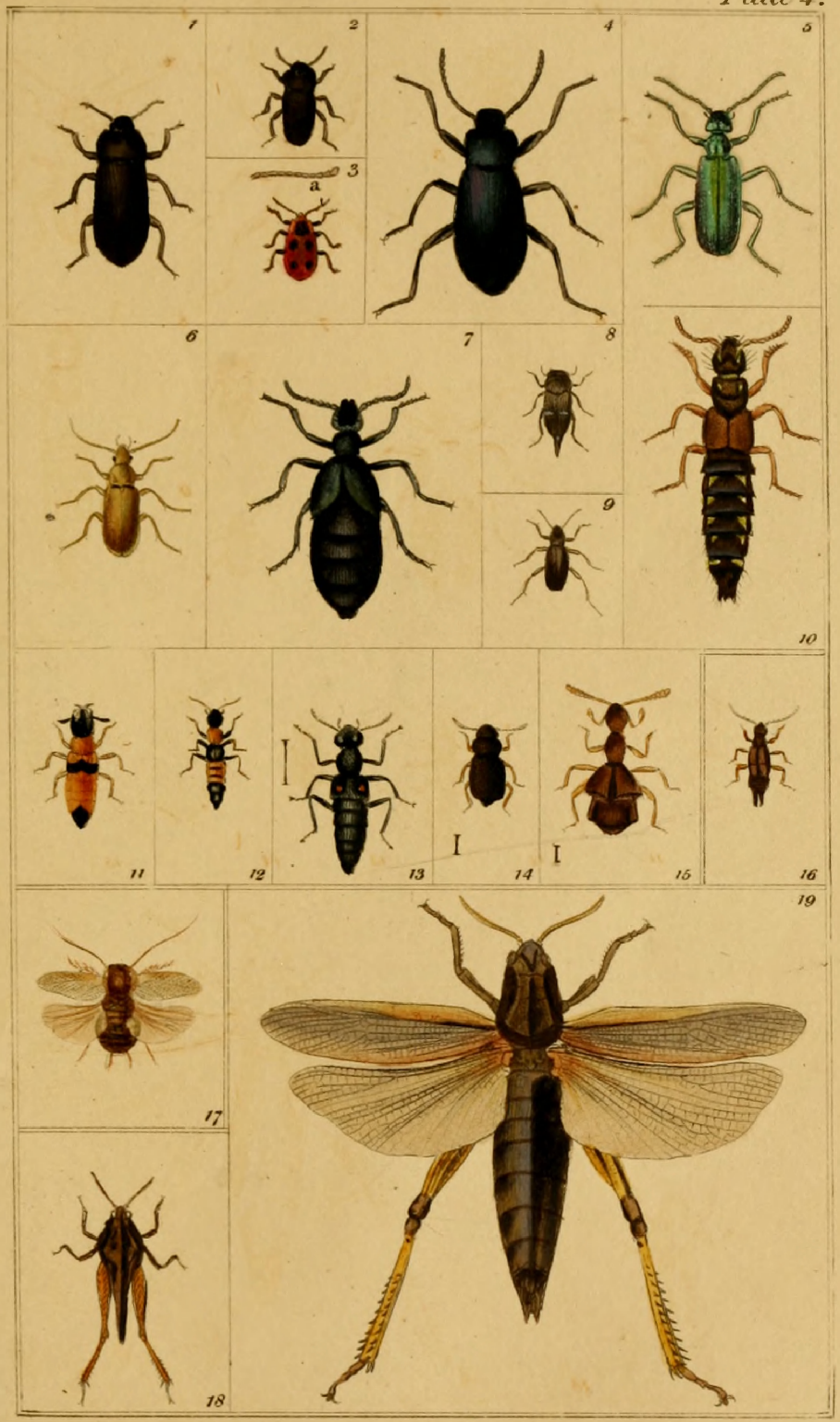

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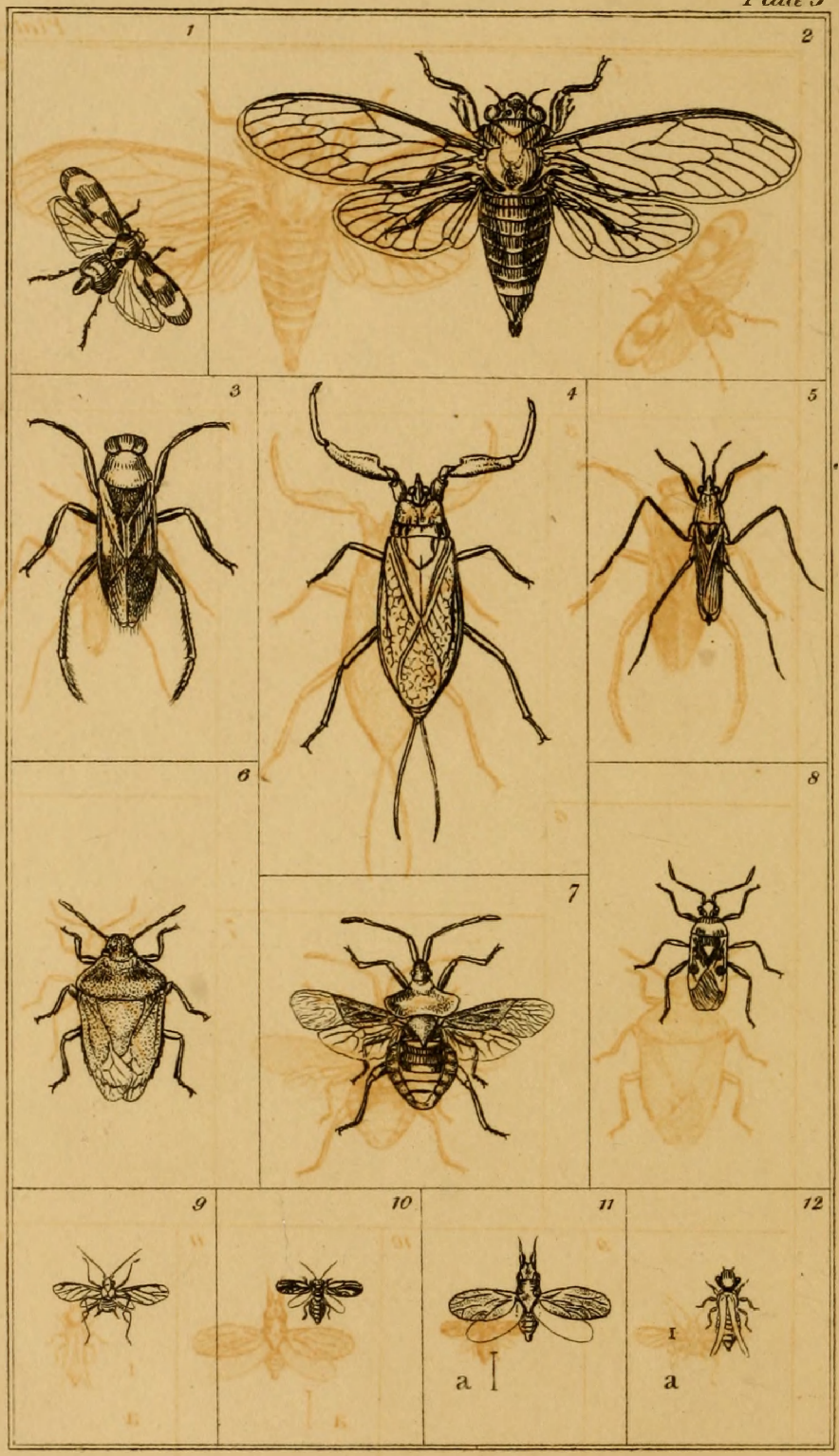

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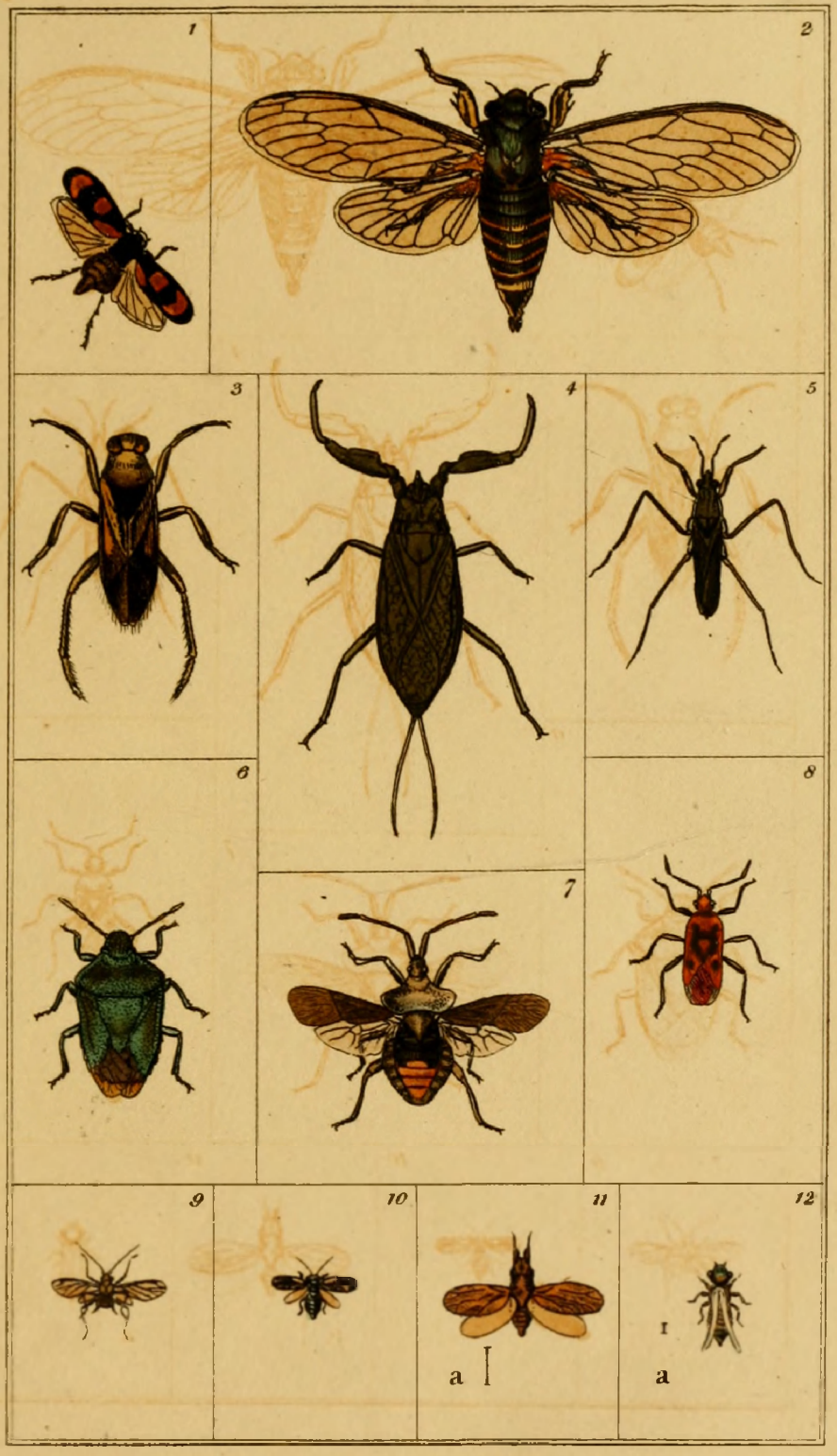

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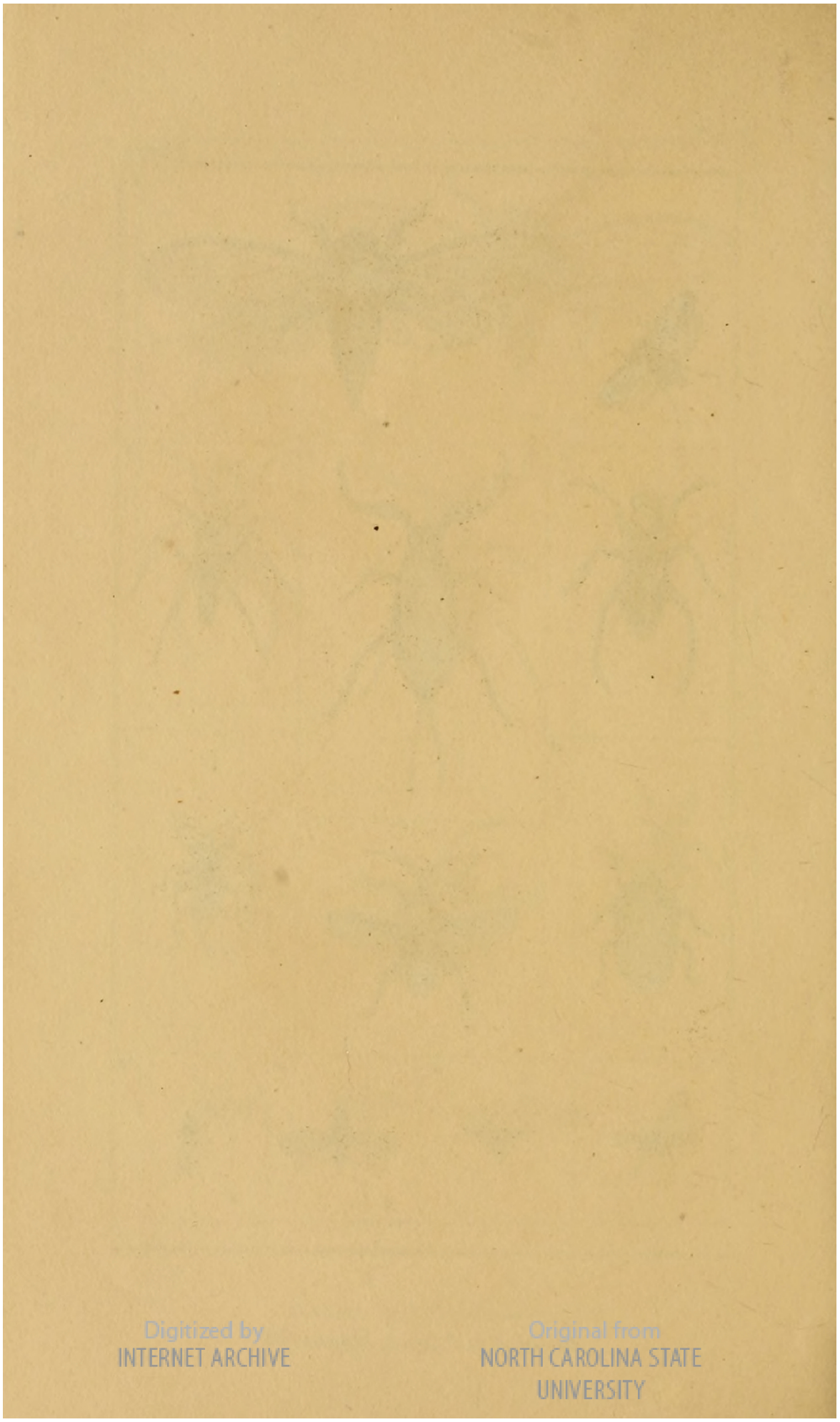

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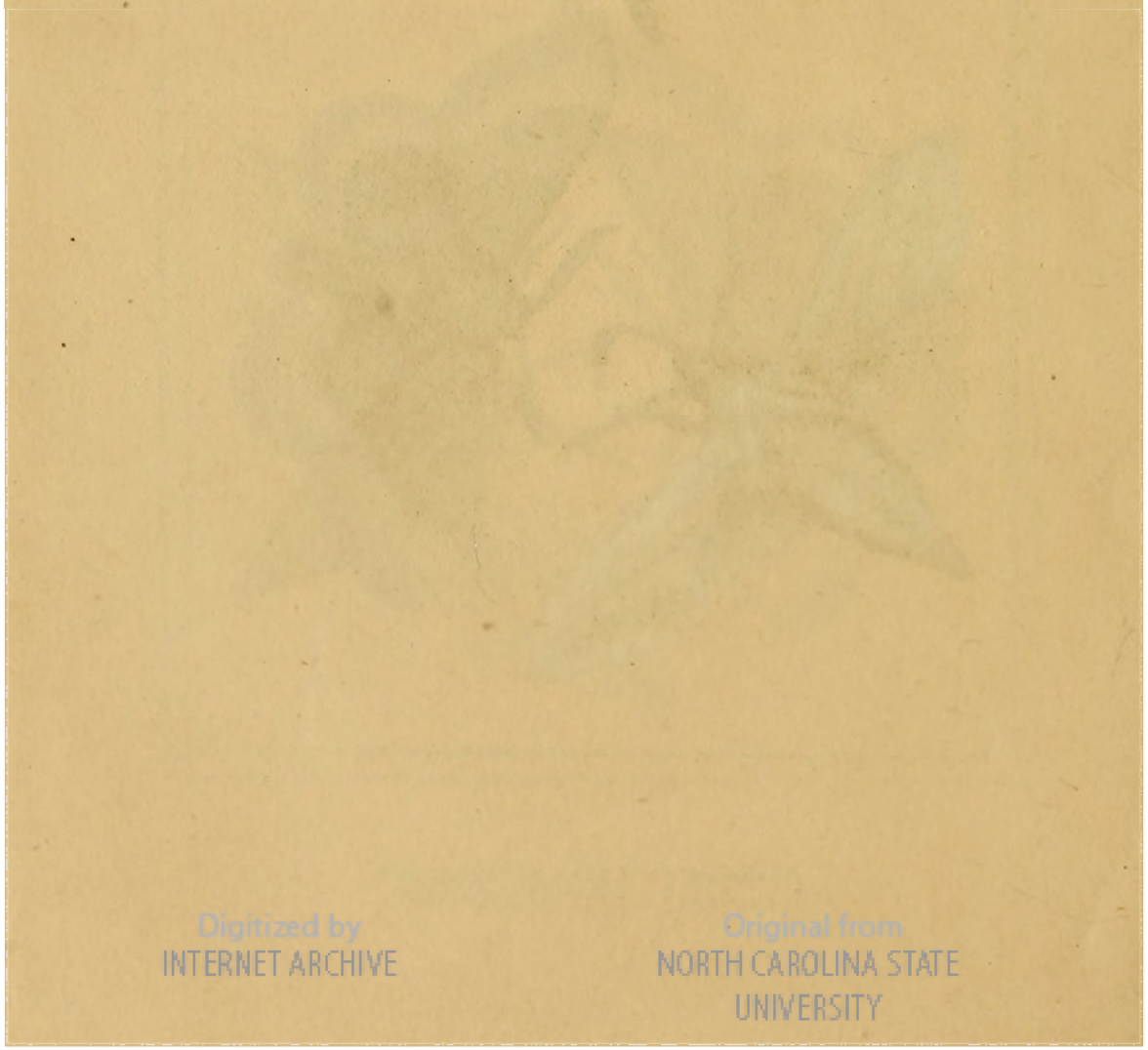

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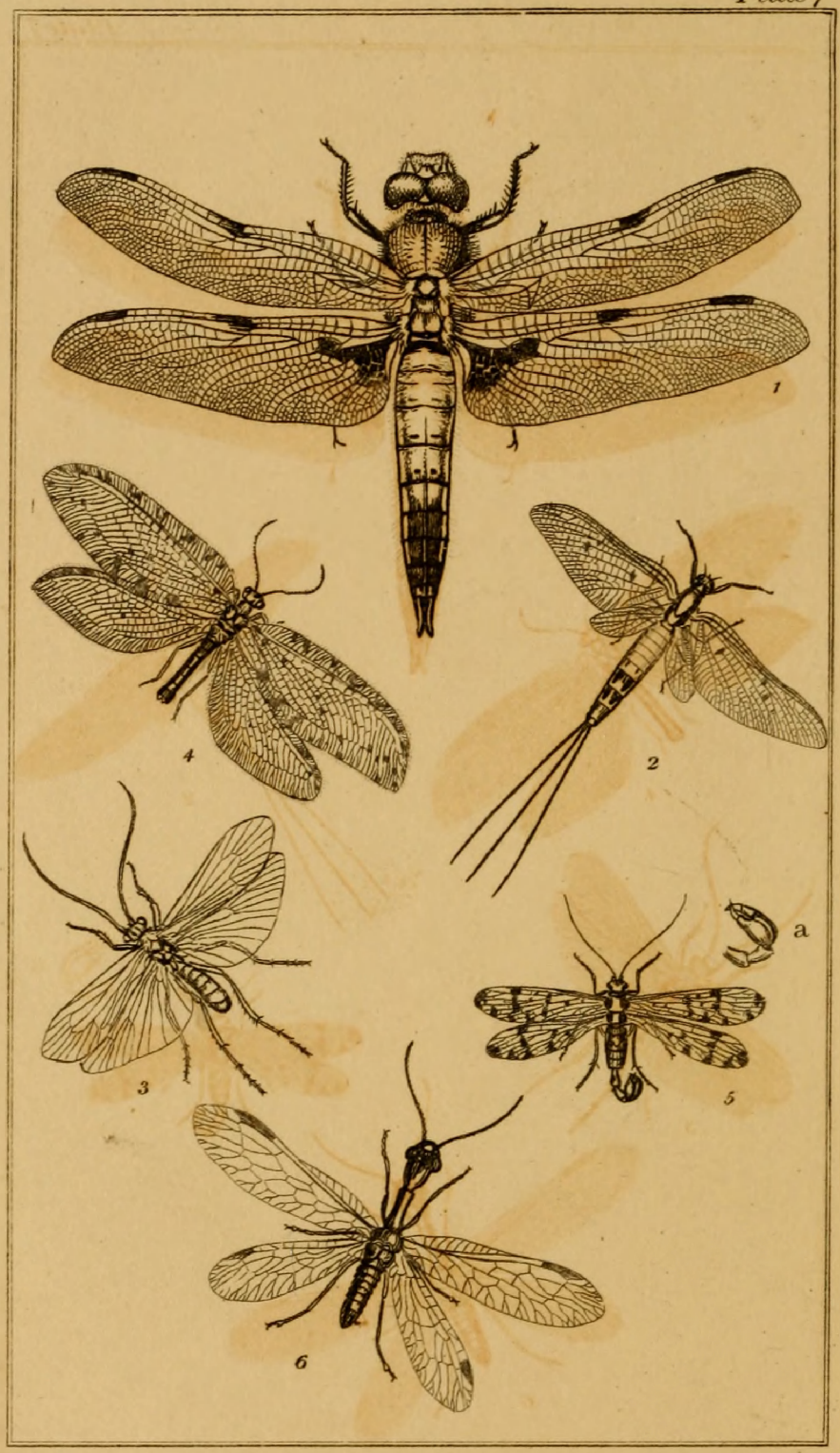

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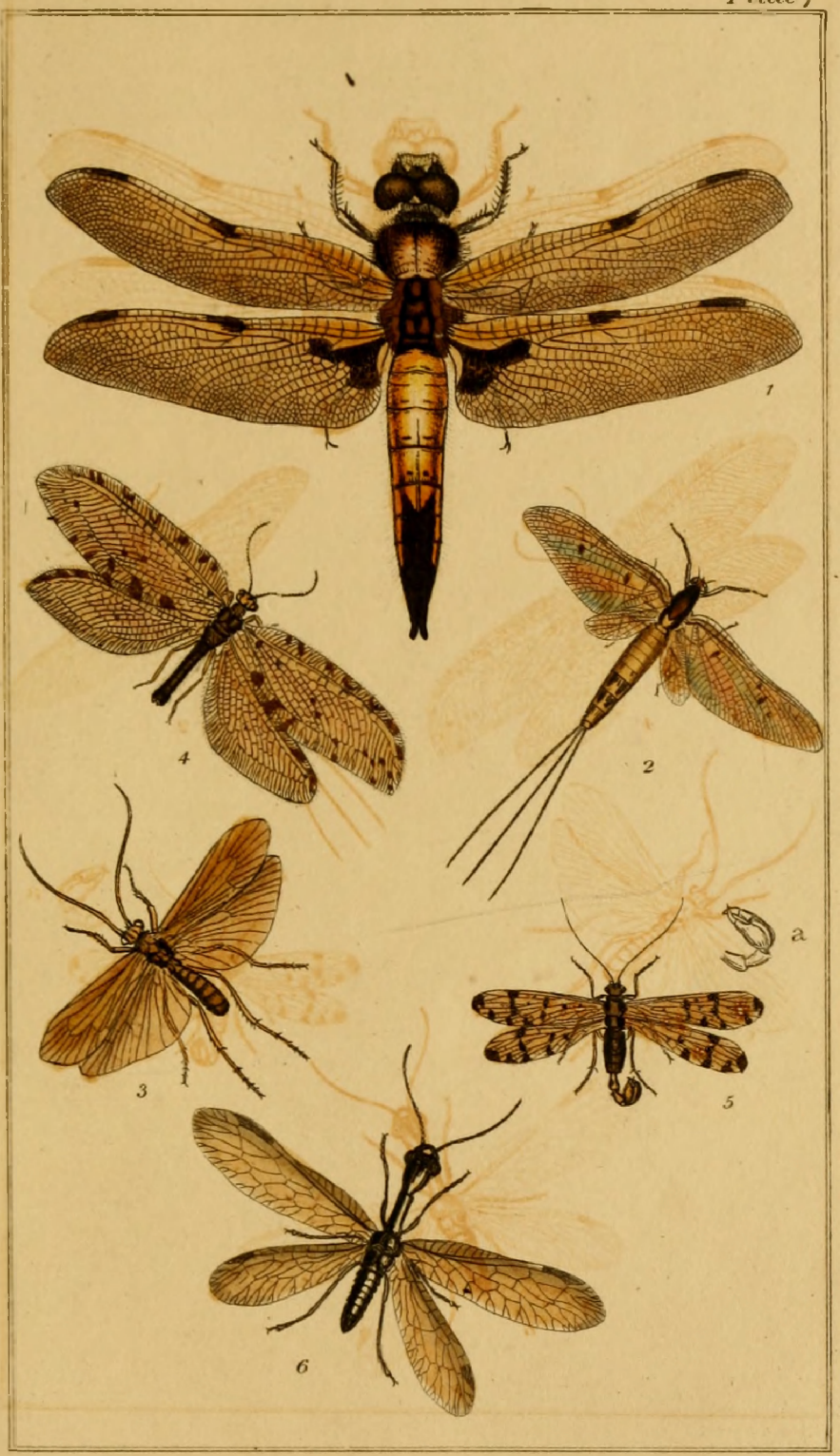

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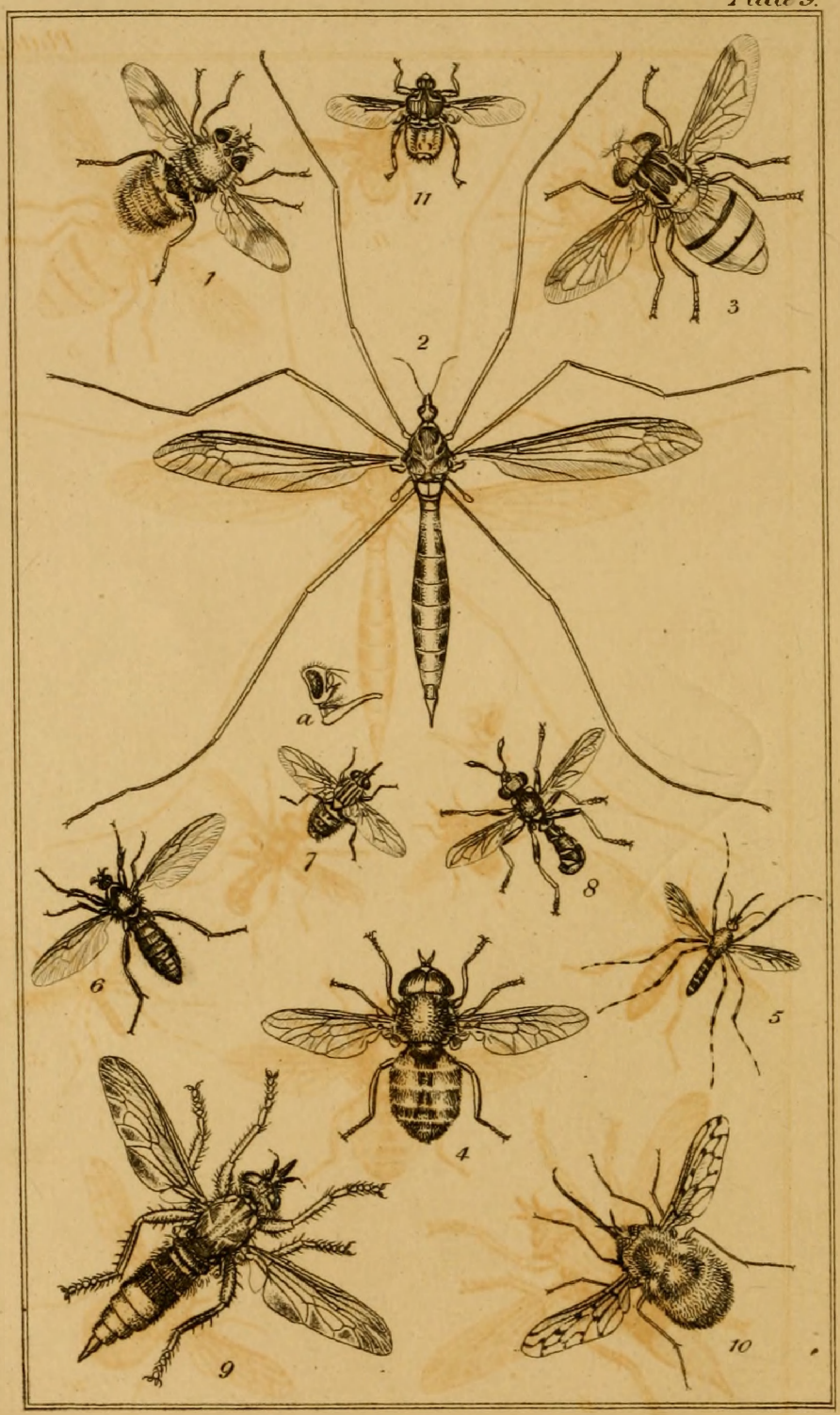

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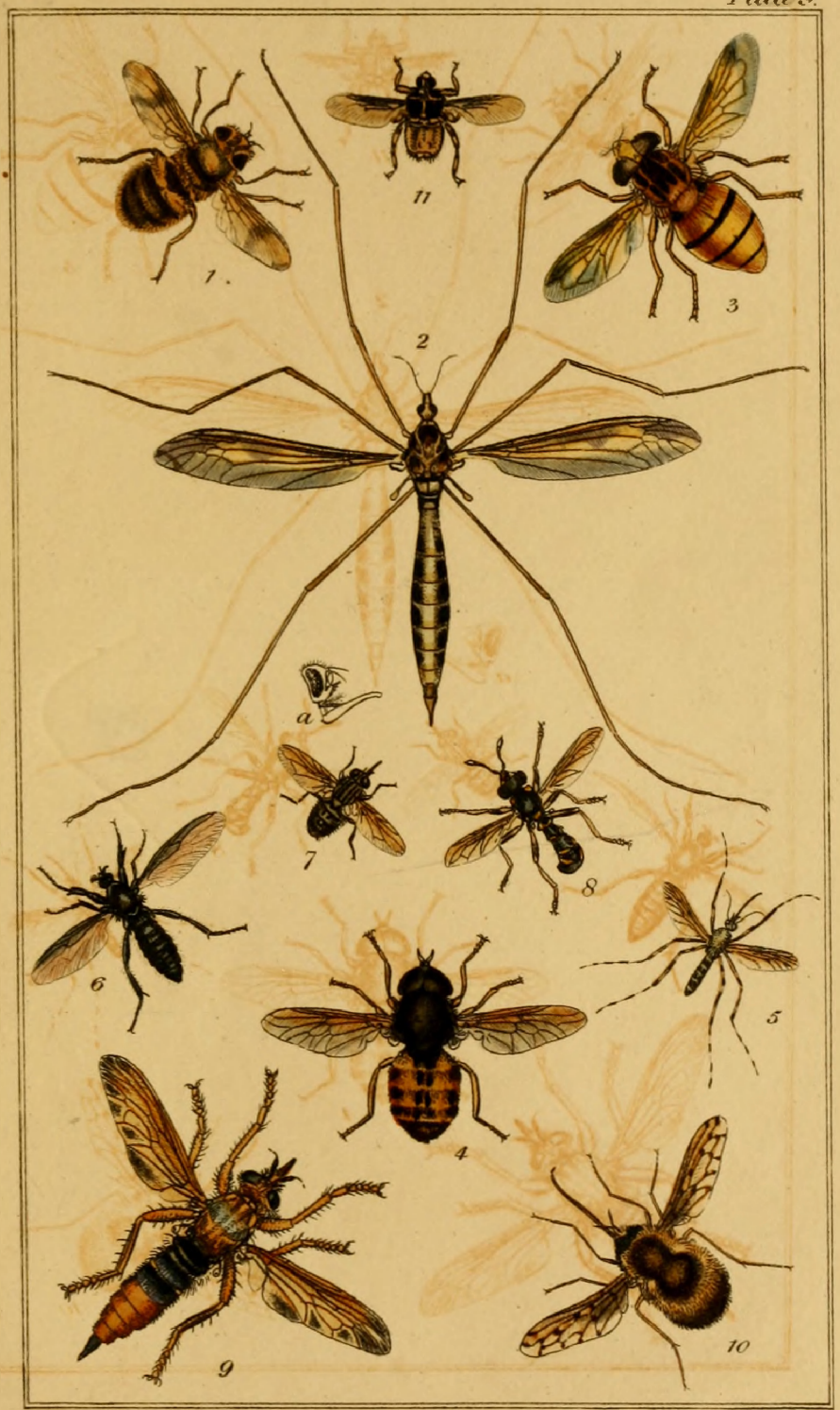

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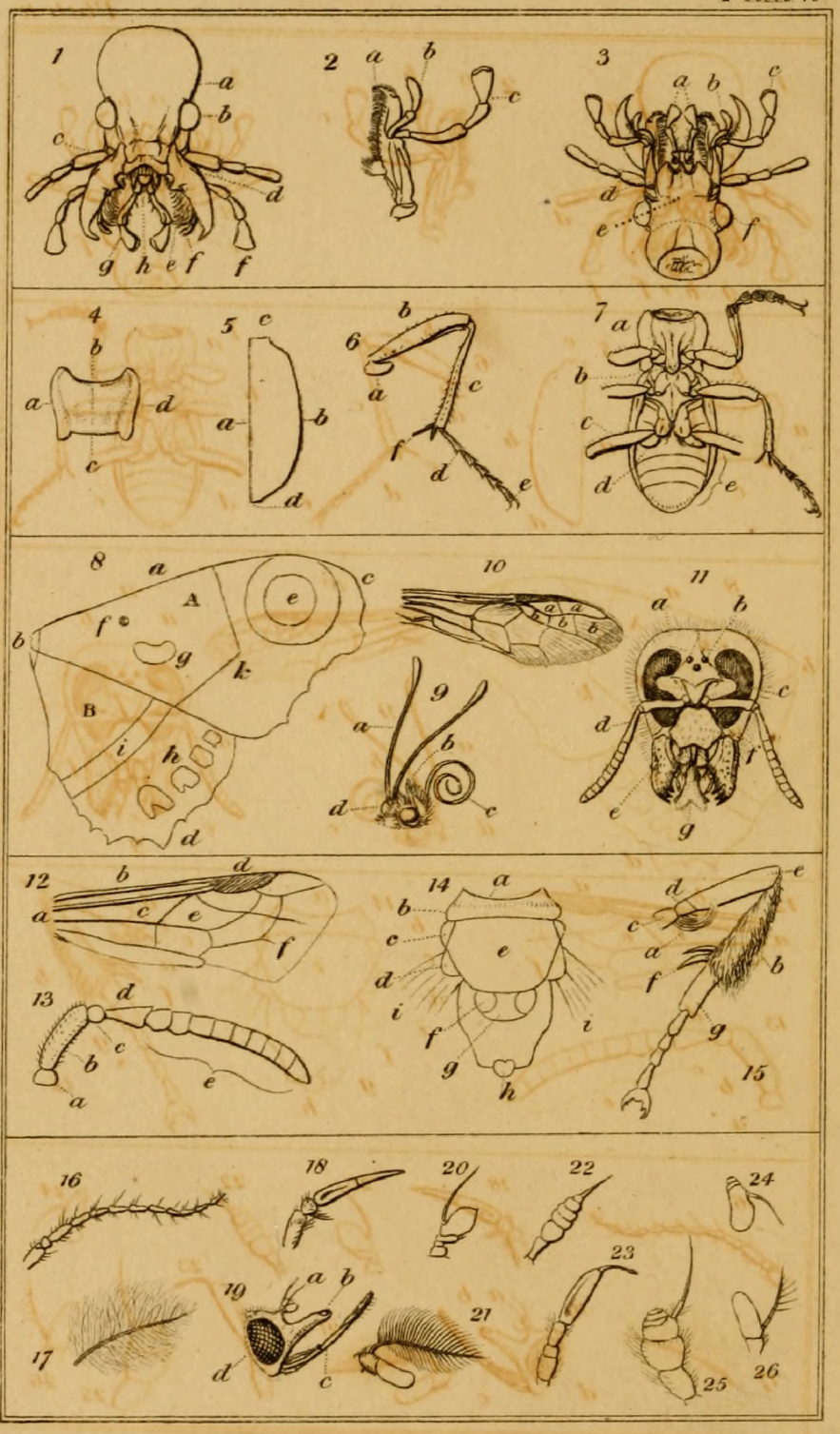

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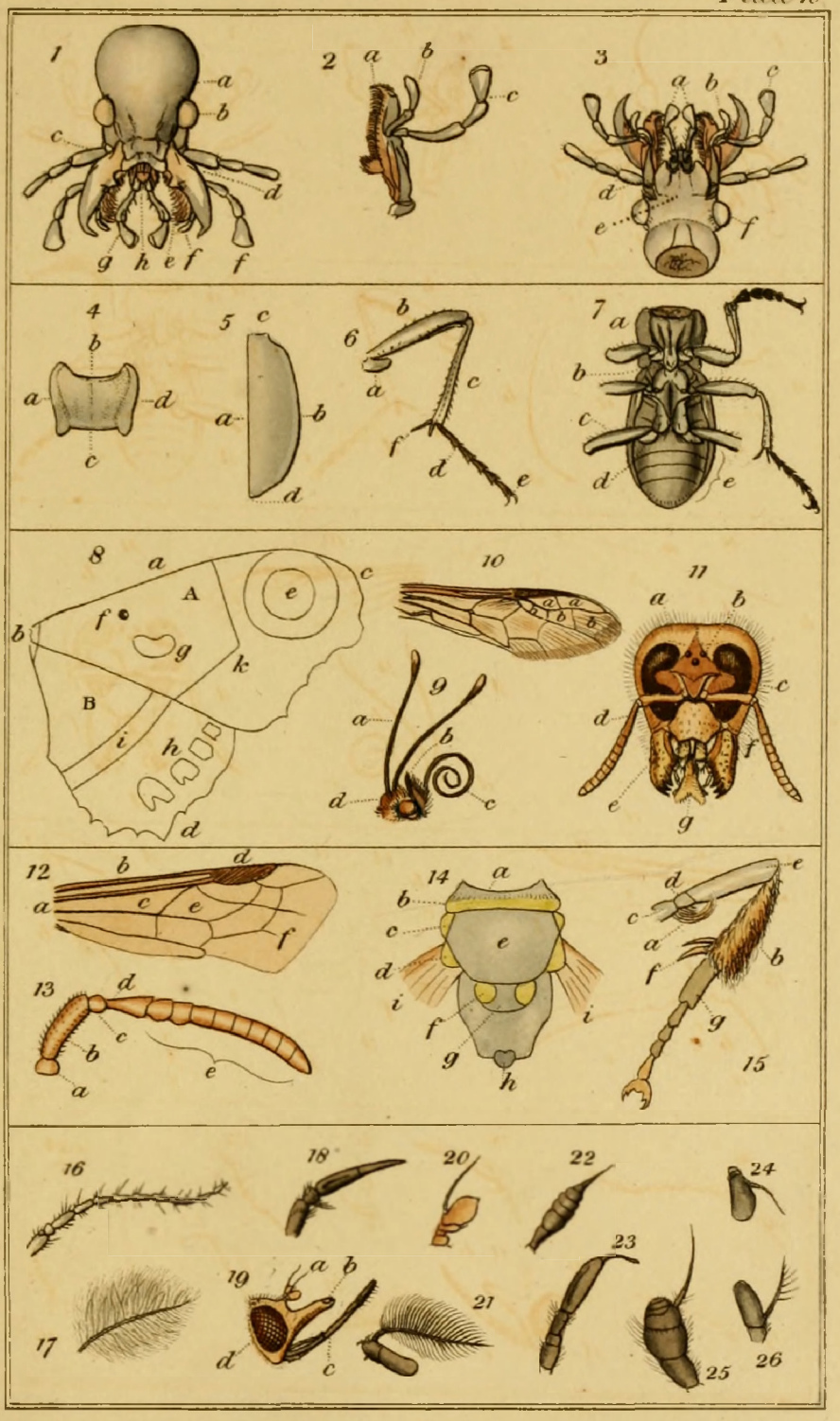

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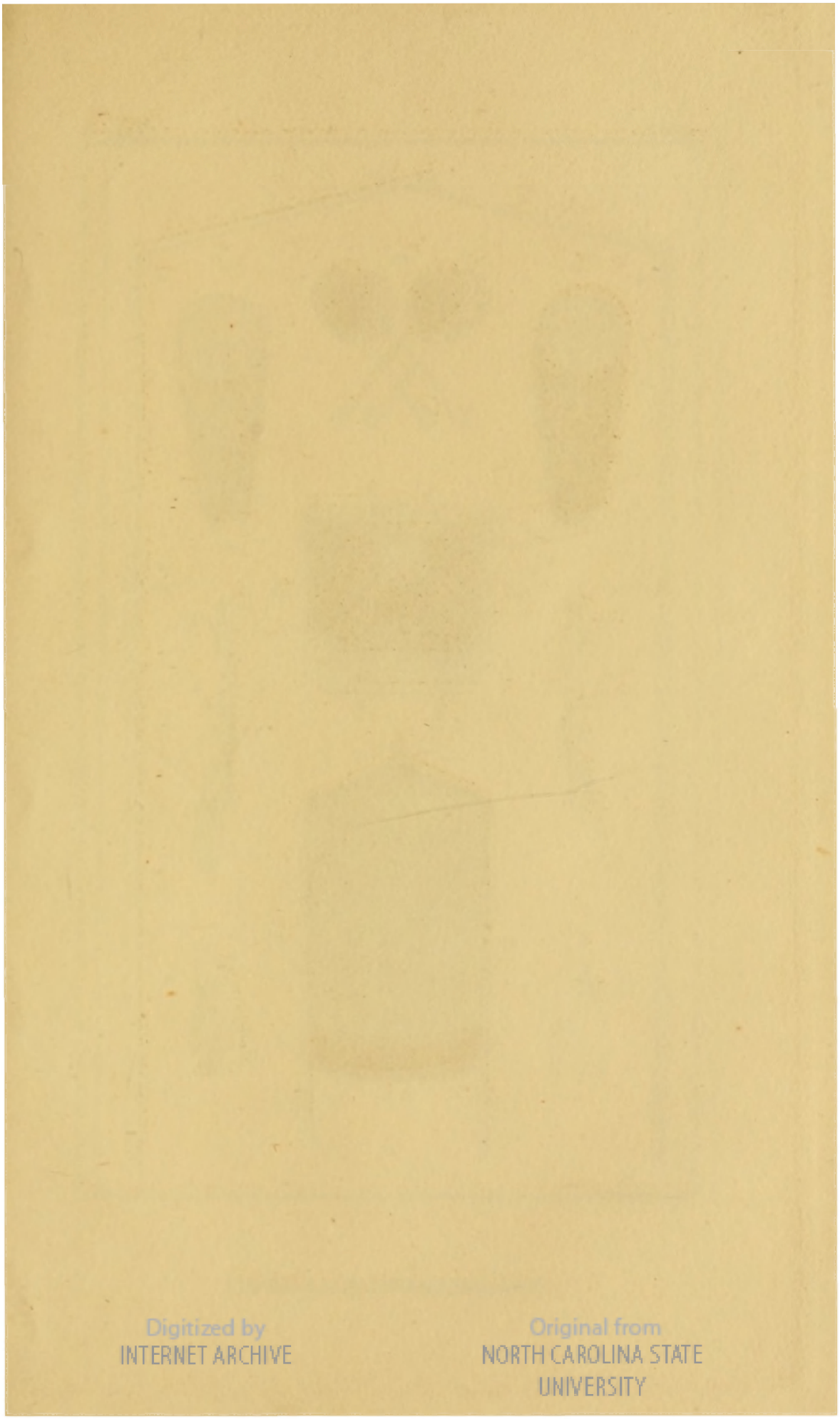

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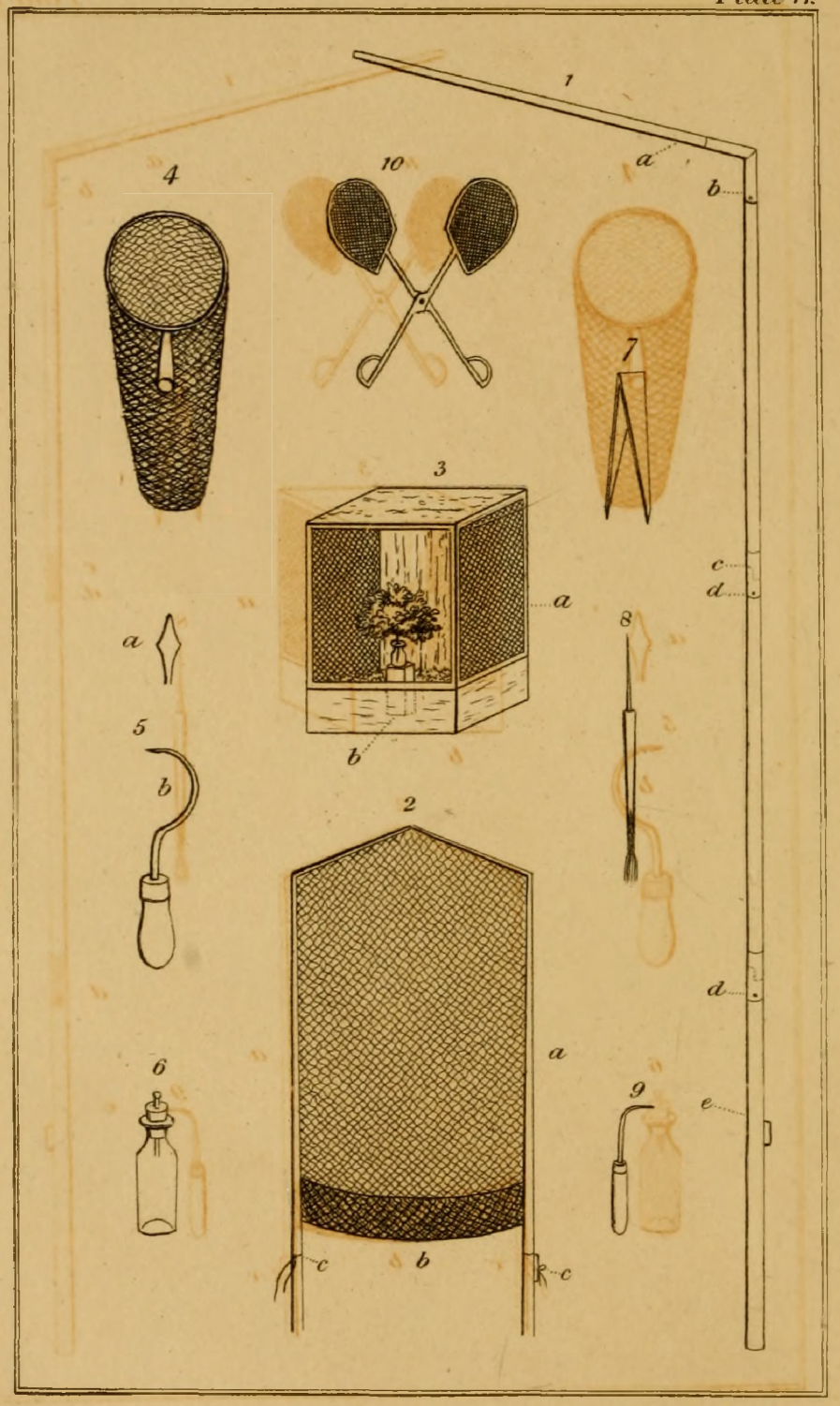
Plate II.



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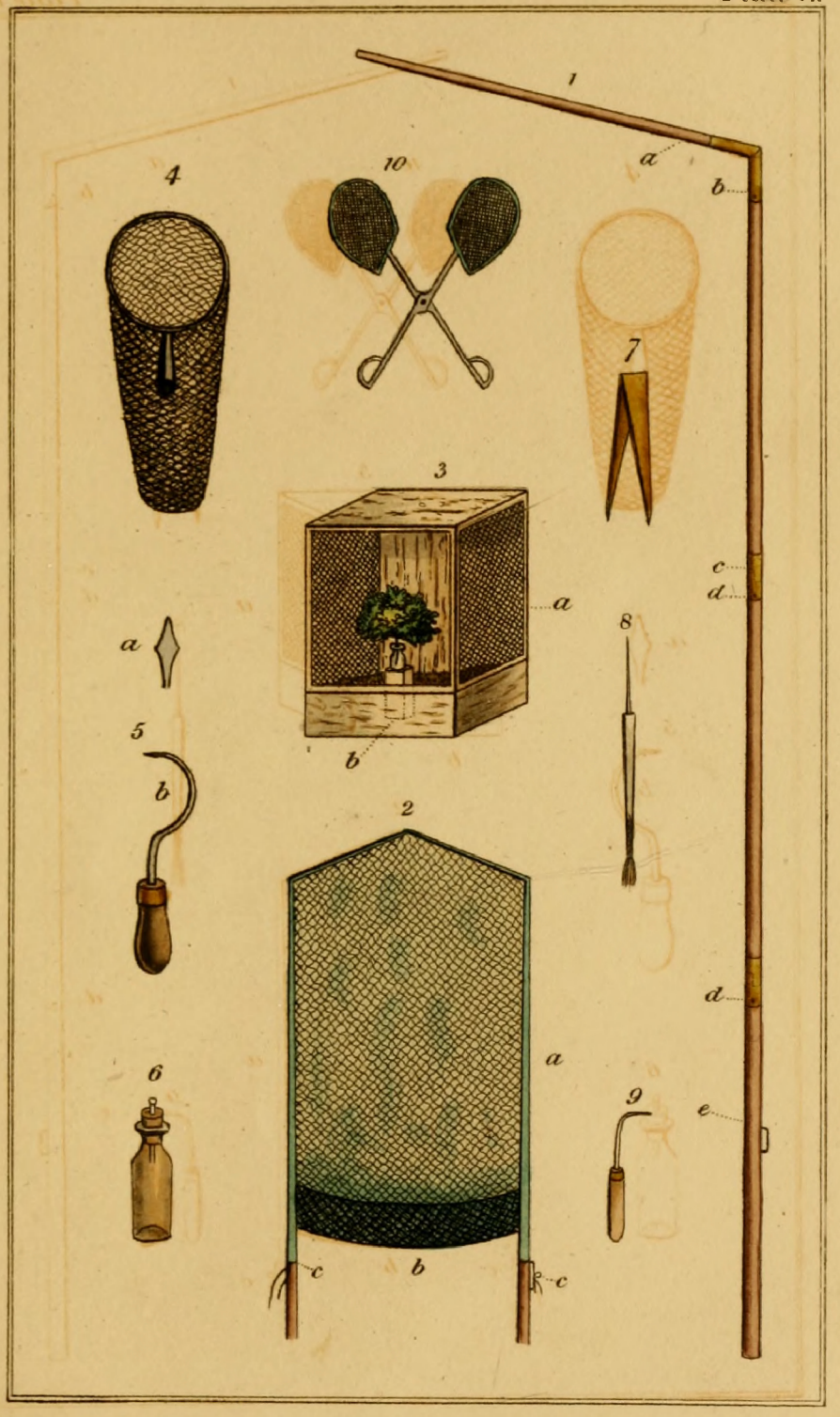

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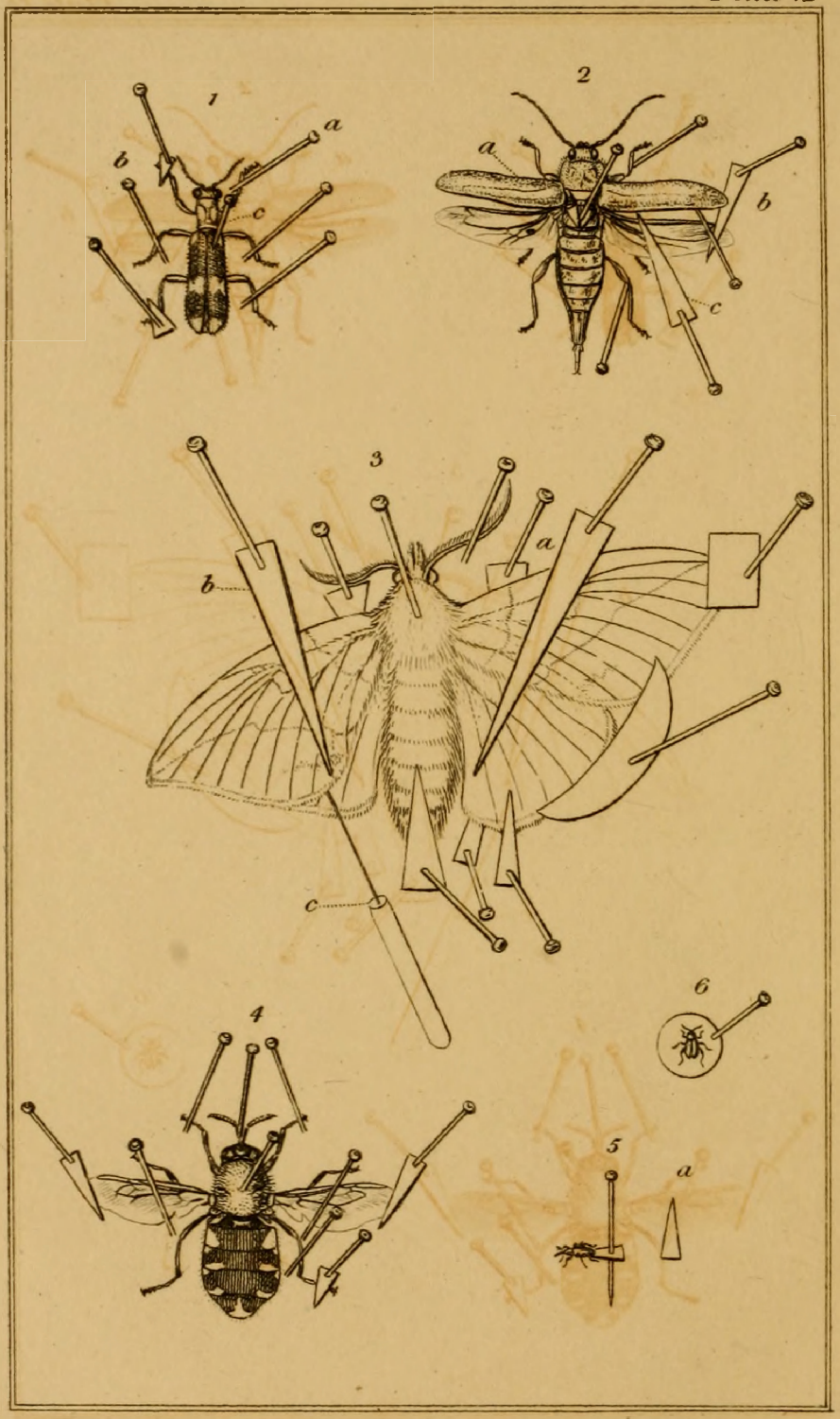

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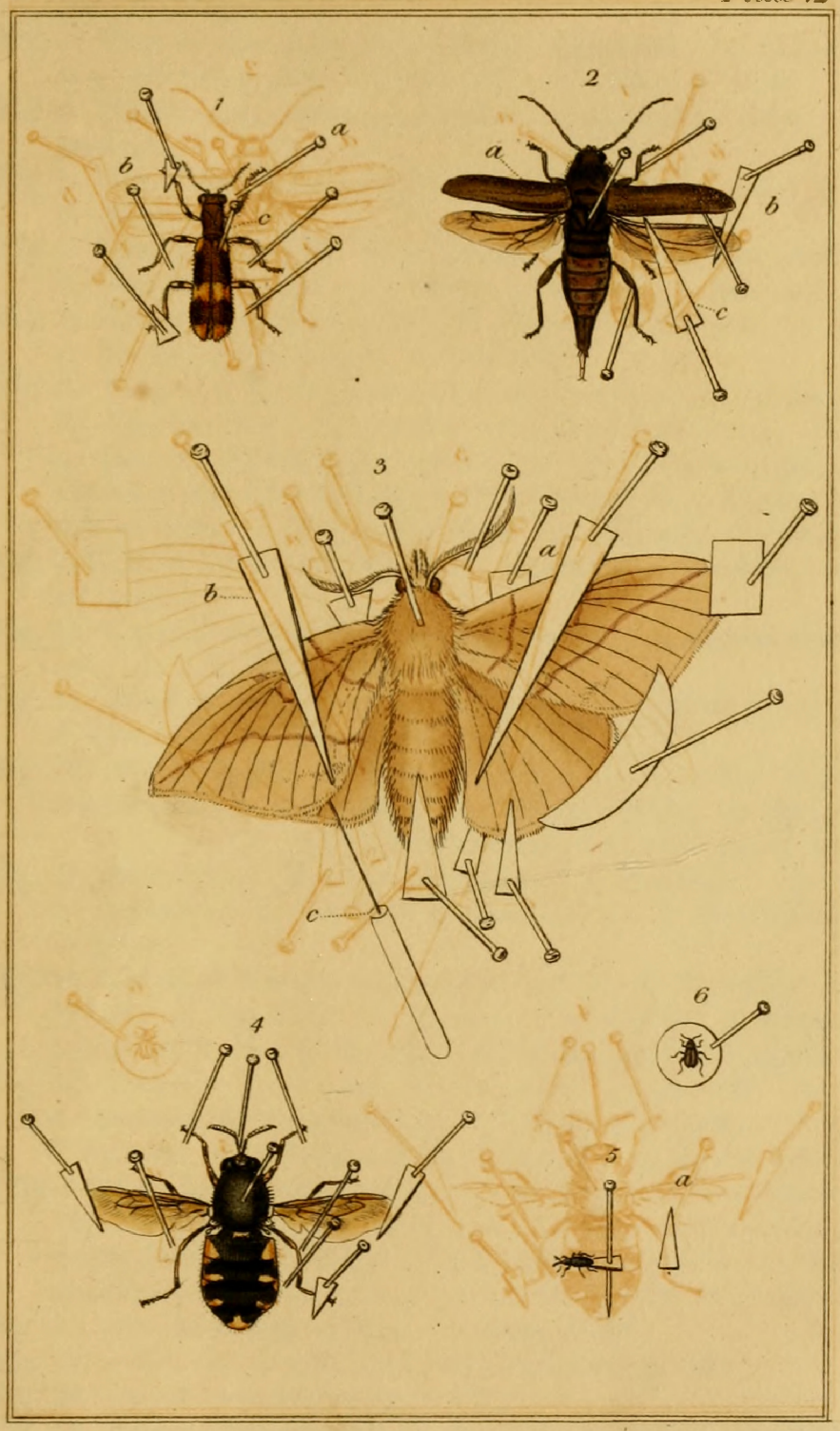

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Fig. 2. a. The *maxilla* separated and magnified to show the situation of the *palpi* b. and c.

Fig. 3. View of the under side of the same head. a. *Labial palpi.* b. c *Maxillary palpi.* d. *Antennæ.* e. *Gula.* f. *Ocelli.*

Fig. 4. *Thorax* of the same. a. d. *Sides.* b. The *anterior part.* c. The *posterior.*

Fig. 5. One of the *elytra* or wing-cases. a. The *sutor.* b. *Side.* c. *Base.* d. *Apex.*

Fig. 6. The *hind leg* of the same insect complete. a. The *Trochanter.* b. *Femur.* c. *Tibiæ.* d. *Tarsi.* e. *Unguis.* f. *Spinulæ.*

Fig. 7. View of the abdomen, &c. a. *Thorax.* b. *Sternum.* c. *Femur.* d. *Margin* of the *Elytra.* e. *Abdomen.*

Fig. 8. Wing of a *Lepidopterous insect* explanatory of the markings, &c. A. *Superior wing.* a. *Anterior margin or costal* edge. b. *Base.* c. *Apex.* B. *Secondary or inferior wing.* d. *Posterior angle.* e. An *Ocellus* or eye-like marking. f. *Punctum* or dot. g. *Stigma.* h. *Maculæ* or spots. i. A *Fascia* or band. k. An angulated line.

Fig. 9. Head of a *Lepidopterous insect.* a. *Antennæ.* b. *Palpi.* c. Spiral tongue.

Fig. 10. *Superior wing of Trichiosoma Lucorum.* a. a. *Areolæ or marginal cells.* b. b. b. *Submarginal.*

Fig. 11. *Head of Vespa Crabro.* a. *Vertex.* b. *Stemmata.* c. *Ocelli.* d. *Antennæ.* e. *Mandibles.* f. *Clypeus.* g. *Lip.*

Fig 12. *Wing of a Bee.* a. *Base.* b. *Exterior costal nerve.* c. *Interior costal nerve.* d. *Anastomosis.* e. *Areolæ* or cells. f. *Apex.*
Kirby's Monograph, tab. 1. * *b.* fig. 7. *vol.* 1.

Fig. 13. *Antennæ of Andrena combinata.* a. *Radicula.* b. *Scapus.* c. *Pedicellus.* d. *First joint of the antennæ.* e. The *articulations.* —*Kirby.*

Fig. 14. *Trunk of Nomada Goodeniana.* a. *Collum.* b. *Collare.* c. *Tubercula.* d. *Squamulæ.* e. *Thorax.* f. *Scutellum.* g. *Metathorax.* h. *Cavitas.* i. *Base of the wing.—Kirby Monog.* tab. 5. fig. 8. vol. 1.

Fig. 15. *Posterior leg of Andrena combinata.* a. *Flocculus.* b. *Scopa.* c. *Apophysis or first articulation.* d. *Second articulation.* e. *Femur.* f. *Spinulæ.* g. *Plantæ.—Kirby Monog.* tab. 4. fig. 10. vol. 1.

I have taken the liberty of introducing the above four figures from Mr. Kirby's excellent *Monograph,* as they will be useful to the young Entomologist, and at the same time show the valuable instruction which may be gained from this justly celebrated work.

Fig. 16. *Antennæ* magn. of Tipula oleracea, p. 291.

Fig. 17. ———— of Chironomus plumosus, p. 290.

Fig. 18. ———— of Empis livida.

Fig. 19. Head of Rhingia rostrata. a. *Antennæ.* b. The *head* anteriorly produced. c. *Proboscis.*

Fig. 20. *Antennæ* highly magnified, p. 296.

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Fig. 21. *Antennæ* of Volucella pellucens, magn. p. 296.
Fig. 22. ——— of Nemotellus uliginosus, magn. p. 292.
Fig. 23. ——— of Asilus crabroniformis, magn. p. 294.
Fig. 24. ——— of Musca punctum, magn.
Fig. 25. ——— of Sargus cupreus, magn. p. 292.
Fig. 26. ——— of Stomoxys calcitrans, magn. p. 298.

PLATE XI.—Apparatus.

Fig. 1. A Net-rod, described at p. 307. *a.* The cross-piece. *b.* The angular ferrule. *c.* The joint fitting into the ferrule *d.* *e.* A small staple for tying the band of the net.
Fig. 2. A net complete;—for the use see p. 307.
Fig. 3. A breeding-cage; see p. 309.
Fig. 4. An aquatic or landing-net for taking water-insects, &c.
Fig. 5. A Digger. *a.* the point.
Fig. 6. A phial for small insects.
Fig. 7. A pair of brass pliers.
Fig. 8. and 9. Setting needles.
Fig. 10. Forceps.

PLATE XII.—Method of Setting Insects.

Fig. 1. Opilis mollis (p. 166).—This figure exhibits the method of setting *Coleoptera* with the wings closed and in a *crawling position*; the *legs* are kept in the attitude designed by pins applied as necessity requires: the *tarsi* are kept flat on the setting-board by card-braces, as at *b.*—Care must always be taken to introduce the pin which serves to transfix the insect, through the right elytron.
Fig. 2. Callidium bajulum with the elytra extended and the wings displayed; in all specimens set in this way the pin must be passed through the middle of the back and near the thorax: the wings are kept extended by braces.

The above methods are also applicable for the Orders *Dermaptera, Orthoptera, Dictyoptera, Hemiptera and Omoptera.*

Fig. 3. Odenesis potatoria (p. 247). The method of setting the Lepidoptera is fully explained at 320.
Fig. 4. Stratiomys Chamæleon (p. 292). *Neuroptera, Hymenoptera,* as well as *Diptera,* may be set by pins alone as is here exhibited.
Fig. 5. Such minute insects as are difficult to pierce with a pin may be placed on small triangular pieces of paper: this method is to be preferred, as almost every part may be examined, and is much superior to the method frequently used, as at *fig.* 6.

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COLLECTIONS OF INSECTS AND OTHER SUBJECTS OF NATURAL HISTORY.

In order to facilitate the study of Natural History, especially those departments most suitable for young persons, it is my intention to form several small collections of *Insects*, *Shells*, *&c.* Each Collection will have an accompanying catalogue of the generic and specific names, with reference to authors by whom the species are described. Single specimens may also be obtained to illustrate genera, as well as to assist those who may be forming collections. Also every kind of apparatus used by the Botanist, Conchologist, Entomologist, or Mineralogist; such as collecting and other boxes, nets, forceps, setting-boards, pins, pocket microscopes or hand magnifiers, cabinets, trays for minerals, shells, &c. either corked or plain. Dissections of insects to illustrate their generic characters, or as most interesting objects for the microscope.

Mr. Sowerby intends also to re-open his very valuable and extensive Museum, for the use of his friends and for the benefit of students and lovers of natural history. The many rare and interesting specimens which this collection contains are highly deserving the honour which it has received from many of the most distinguished personages. The abilities and industry of its possessor are sufficiently known through the medium of his voluminous scientific and useful works. This gentleman has also been induced to offer for sale his duplicate specimens, which consist of subjects in every department of Natural History. These of themselves would form no mean Museum. However, he intends to dispose of them in small parcels to give the student an insight into the science, or in single specimens for the accommodation of those who may already possess collections, and to whom such species may be *desiderata*.

Those ladies and gentlemen who reside in the country may have collections, or any of the apparatus sent them, through the medium of their booksellers, by an application to Mr. Boys the publisher, to the Author, or to Mr. Sowerby, No. 2, Mead Place, Lambeth.

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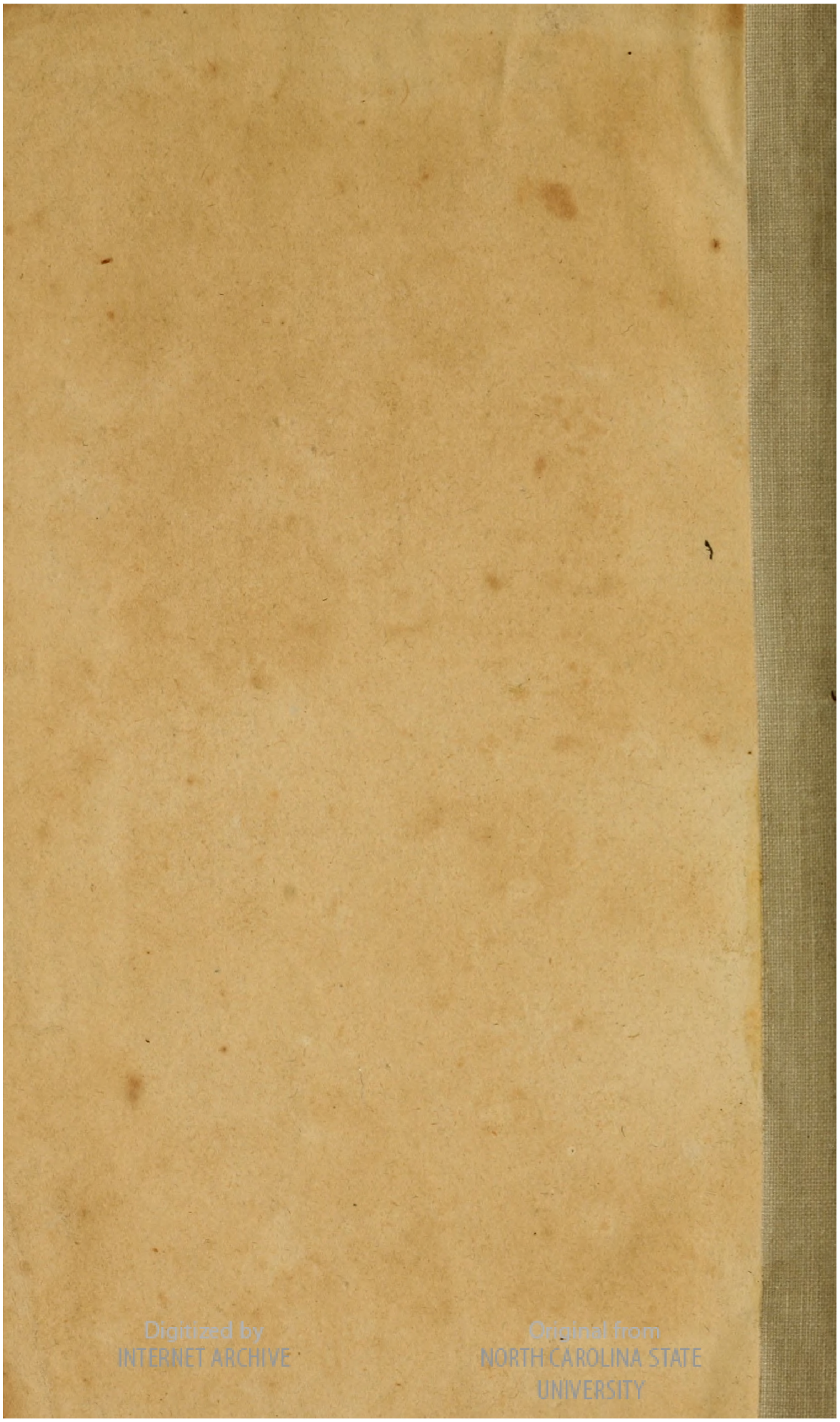

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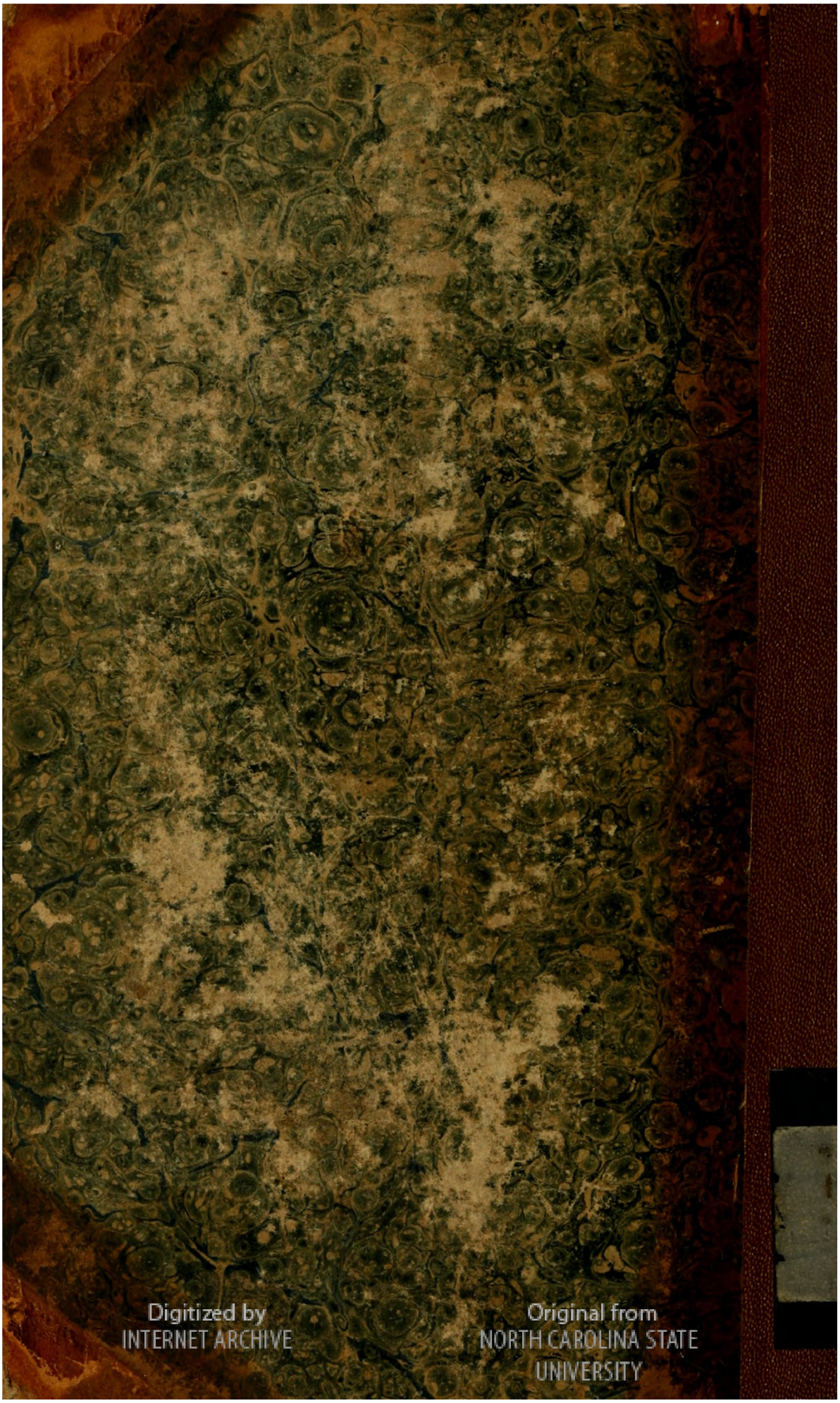

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