HYMENOPTERA.

Notes on Hymenoptera.

By Frederick Smith.

If the reader were to refer to the pages of "The Entomologist's Annuals," for the last eleven years, he would observe, that year after year we are adding to the list of the British Aculeate Hymenoptera.

It is true that many discoveries have to be made before our list approaches, in the number of both genera and species, that either of France or Germany. Both those countries possess, independent of the advantages of climate, a much larger number of hands labouring in the vast field of the Aculeate Hymenoptera. If we look over a list of the Hymenoptera of Europe, we notice many genera, that are pretty generally scattered over most parts of the Continent, altogether wanting in the British list; this, to some extent, will probably always be the case; but of those genera, common to England, as well as to the Continent, it will be found, that year by year, slowly, but I trust certainly, we are approaching the Continental standard.

In an old list of the British Hymenoptera I find the species, *Scolia quadricincta*, *Pelopæus spirifex*, *Sphex flavipennis*, *Larra ichneumoniformis*, and *Bembex octopunctata*, all belonging to the tribe of the Fossores; *Systropha spiralis*, *Melitturga clavicornis* and *Xylocopa violacea*, belonging to the tribe Anthophila, enumerated

as British insects; all these genera are now expunged from our list, one or more, I trust incorrectly so; not one of these species has been captured in England during the last thirty years, but many localities, frequented by Entomologists of former days, may not have been explored by collectors of the present day; be this as it may, it will, no doubt, be desirable to wait until some recent capture warrants any of the above insects being again incorporated in the British list. There are many extensive portions of inland country, as well as long ranges of our coasts, but very slightly explored; many species, new to our Fauna, may be reasonably expected to be discovered, both on the north and south Devon coasts; Braunton Burrows would surely yield species new to our fossorial list, whilst at Torquay,—the Montpellier of England,—surely we may confidently reckon upon the discovery of one or more of the insects that I have enumerated above.

If the coasts of Devon were thoroughly investigated, I feel assured the task would amply repay the Hymenopterist who undertook such a tempting excursion. These are not, however, the only unexplored localities; portions of the south-eastern coast have never been well hunted over by competent Hymenopterists, and I feel fully pursuaded, that we have a very imperfect knowledge of the bees of Scotland and its islands. If any of our younger Entomologists are deterred from turning their attention to the Hymenoptera, under an impression, that our Fauna of that order is pretty well known; let the experience of one who has turned his attention to these insects during the last thirty years, undeceive him; each succeeding year more thoroughly convinces me, that there is no order of insects, in which more important discoveries are likely to be made. I feel assured that whenever a young and zealous band of Hymenop-

terists shall spring up, the truth of my opinion will be confirmed.

Of all the genera to which the foregoing remarks would apply, as affording direct proof of their truth, that of *Formica* has perhaps, during the last few years, furnished the most ample testimony. Year after year, fine additions to the British list are being made; this is extremely gratifying, because a hope may be indulged that many, whose studies will not admit of their entering upon the vast field of the Hymenoptera, may be induced to direct a portion of their attention to the *Formicidæ*; if they can but once be persuaded to do so, there is no fear of any true lover of Entomology ceasing to investigate the Ants, undoubtedly the most intelligent and interesting Family in the entire range of the World of Insects; nowhere do we find such endless variety of form, and, whilst their economy is varied to an illimitable extent, their instinctive sagacity surpasses that of all other members of the class Insecta; time, I doubt not, will prove the truth of my ratiocinations.

In 1835, the British list of the *Formicidæ* consisted of eight species of the genus *Formica*, seven of *Myrmica*, and one of each of the genera *Myrmecina*, *Stenamma* and *Ponera*; such was the list at the time of the publication of the first volume of "The Entomologist's Annual;" the following is a complete list of the species at present known:—

List of the British Formicidæ.

Genus Formica.

Formica rufa.
„ congerens.
„ sanguinea.
„ exsecta.
„ cunicularia.
„ fusca.

Genus Formica—*cont.*

„ gagates.
„ nigra.
„ umbrata.
„ aliena.
„ flava.
„ fuliginosa.

Genus Tapinoma.

Tapinoma erratica.
„ polita.

Genus Ponera.

Ponera contracta.
„ punctatissima.

Genus Myrmica.

Myrmica ruginodis.
„ scabrinodis.
„ lævinodis.
„ sulcinodis.
„ lobicornis.

Genus Tetramorium.

Tetramorium cæspitum.
„ lippula.

Genus Leptothorax.

Leptothorax acervorum.
„ Nylanderi.
„ unifasciata.
„ simillima.

Genus Stenamma.

Stenamma Westwoodii.

Genus Diplorhoptrum.

Diplorhoptrum fugax.
„ molesta.

Genus Pheidole.

Pheidole lævigata.

Genus Myrmecina.

Myrmecina Latreillii.

In 1865, our list will be found to consist of twelve species of the genus *Formica*, two of *Tapinoma*, and two of *Ponera*, to which must be added thirteen species of *Myrmicidæ*, amounting in the aggregate to thirty-one species, being an increase of thirteen since the publication of the first volume of the Annual.

In the above list I have included *Pheidole lævigata*, undoubtedly an imported species, introduced within a very recent period, but so firmly has it established itself, in some parts of the metropolis, as to have become a household pest, whilst at the same time it is an ant common to the majority of hot-houses, so that it may be considered as securely naturalized as the more common *Diplorhoptrum molesta*.

Formicidæ.

Last year I had the pleasure of recording the discovery of a most interesting species of ant, the *Formica exsecta*: only

a few specimens were at that time taken, but in August last, I had an opportunity of revisiting Bournemouth, the place of its first capture and am now enabled to give some account of the habit of the species.

Formica exsecta is by no means rare, at, and in the neighbourhood of Bournemouth, although it does not appear to be very widely diffused; probably its range will prove not to extend beyond the extensive heaths in that neighbourhood, which are being fast brought under cultivation; I found a single nest on a small isolated piece of common, at the side of Poole Harbour. The nests of this ant seldom exceed ten or twelve inches in diameter at their base, from which they rise in a conical shape to a height of eight or ten inches; the materials of which the nests are built are a mixture of dried grass, cut up into small pieces, and usually some small fragments of twigs; but, if the nest is situated near to fir trees, the needles of the fir are substituted. The nests are very commonly found in unsheltered situations, on open sterile heaths, and in plantations of fir; they are very populous, and the worker ants of this species are extremely ferocious, their bite is sharp, and their hold so tenacious, that in removing them from the face or hands, the body frequently parts from the head. In the month of August not a single male or female is to be found; in vain did I investigate, with the greatest care, numerous nests, in the hope of at least securing the female. The sexes would no doubt be found plentifully about the beginning of June; a visit to these nests, in the early part of the season, would probably be the means of discovering some interesting species of myrmecophilous Coleopteron not yet found in this country. I trust some of our Coleopterists will be induced to follow up this hint.

Formica congerens.—This is the common wood-ant at

Bournemouth; I have not yet found *F. rufa* there. Mr. Dale observed some small moths in the nest of this ant, but was not so fortunate as to capture one, probably this was the *Tinea ochraceella*; as the nests of this species of ant are numerous, it would probably repay any Lepidopterist for the annoyance to which he would be necessarily subjected in searching for the little moth; some of the nests of *F. congerens* are as much as five feet in diameter at the base, and are elevated from two to three feet, the colonies being quite as populous as those of *F. rufa*.

Formica gagates.—This species is now for the first time added to the British list; a few specimens were taken by my son, but the discovery was not made until we had returned to London from Bournemouth; it is a species widely distributed on the Continent, beïng found in France, Germany, Prussia, Switzerland, Austria and Hungary. The species most closely resembles *T. fusca*, but the workers are larger, blacker, and more shining; and the abdomen has a quantity of erect rigid hairs; the following is a description of the worker:—

Worker.—Length 2¼—3 lines. Shining black, with the mandibles, antennæ and articulations of the legs rufescent; the tibiæ and femora piceous; abdomen shining and sprinkled with a number of erect hairs; the scale of the petiole truncate above and slightly emarginate.

Formica aliena.—This species was established by Foerster, in his Monograph on the *Formicidæ* of the German provinces of the Rhine; Dr. Nylander doubts its being distinct from *F. nigra*, but I am of opinion that it is a good species, Dr. Mayr also considers it to be so. Only workers have been taken in England, to my knowledge; the other sexes may, however, be mixed with those of *T. nigra* in collections that I have not seen; I think it probable that this is the case.

It is very like *T. nigra*, but it has a longer and narrower head, the antennæ are not hairy, neither are the legs. It is a burrowing ant, and may be found on the sand hills at Deal, as well as at Bournemouth.

Tapinoma erratica.—This usually rare species of ant is plentiful on the open heaths to the west and north west of Bournemouth; it burrows in the flat bare spaces that occur among the furze bushes, where the turf has been pared off; in August, only pupæ and larvæ of workers were found; it may also be taken at Weybridge in similar situations.

Ponera contracta.—This very local insect was taken by Mr. David Sharp in Headley Lane, Mickleham; it is a species which I never had the good fortune to capture; Dr. Power has taken it at Brighton, and also at Merton, in Surrey.

Myrmica lobicornis.—I believe not more than half-a-dozen specimens of this very distinct species are to be found in British collections; those taken by the late Mr. Curtis, and also by Mr. Dale, in Scotland, were the first discovered in this country. I found a locality for the insect at Lowestoft, Suffolk, and took four specimens of the female in 1859. During the past season, Mr. Rye captured a worker at Seaford, in Sussex, where it was apparently plentiful, but not being at the time aware of the rarity of the species, he neglected to secure more examples.

Myrmecina Latreillii.—This is one of the rarest ants that occur in this country; the male was first discovered by Mr. Curtis, in 1829, near Black Gang Chine, in the Isle of Wight, where it has has been subsequently taken by other Entomologists; it is not unlikely to be found in most parts at the back of the island, having myself found it both at Luccomb and Shanklin; the female was also first taken by Mr. Curtis, it has also occurred at Lulworth Cove, Dorset,

and I have taken it in Kentish Town; the worker had not been discovered in England until September last, when Mr. Sharp found a nest at Mickleham. An exquisite figure of the male will be found in the sixth volume of Curtis's British Entomology, and one of the female illustrates a paper by the same author, in the twenty-first volume of the Linnean Transactions; the following is a careful description of the worker:—

Length 1¼. Black; the mandibles, clypeus, sides of the face before the eyes, the antennæ, the truncation of the metathorax, the peduncle beneath, the apex of the abdomen and the legs, reddish-yellow; the body thinly sprinkled over with erect bristly pale hairs; the abdomen very smooth and shining. The mandibles toothed on their inner edge, and striated at their base; the clypeus with its anterior margin deeply emarginate, forming a tooth at each angle of the emargination; the antennæ elbowed at their base; the head is longitudinally wrinkled above, or rugose. The scape nearly as long as the head; the flagellum clavate; the club consisting of three joints, the apical joint longer than the two preceding, and acuminate at the apex, it is also much thickened in the middle. The thorax irregularly, longitudinally and deeply wrinkled, or striated; the metathorax armed with two short, stout and acute horizontal spines; the truncation of the metathorax is smooth and somewhat concave; the peduncle coarsely rugose. The abdomen is widest beyond the middle.

The worker of *Myrmicina* most closely resembles that of *Tetramorium cæspitum;* the resemblance is only general, because in no minutiæ do they agree, but it might be overlooked by any person not intimately conversant with the specific differences of the two insects.

Myrmecina has much thicker and shorter antennæ than *Myrmica*, its legs are also shorter, stouter and uniformly red.

On the Continent this species has been taken at Vienna, in the Tyrol, in Ukraine, Nassau, Wiesbaden, Bonn, Aix-la-Chapelle, in Rhenish Prussia and also in Italy.

In October last, I took a large number of *Formicidæ* at Lynmouth and Ilfracombe, but not a single species of any rarity occurred; it was certainly too late in the season to form a correct estimate of the *Formicidæ* of that charming portion of North Devon; but I may record a very remarkable departure from the normal habit of *Formica fuliginosa* observed there—a species that usually burrows in old decaying trees or posts; near Ilfracombe, I observed this ant inhabiting fissures in the rocks, on the top of one of the highest Torrs, and also on Carntop; in the lanes near Coomb Martin, I found it inhabiting burrows it had formed in the mud with which the walls at the roadside are apparently built.

In France, twenty-eight species of the genus *Formica* have been discovered, and about the same number also in Germany; at this time, the British species of that genus only amount to twelve; the Continental list of the *Myrmicidæ* contains about twenty-eight species, whilst the British one, only enumerates sixteen; this discrepancy in numbers ought to arouse English Hymenopterists to renewed vigour, and, if my hope prove successful, of enlisting the co-operation of Coleopterists, and also collectors of other orders, to turn their attention to these insects, I have no fear of bringing up the list of British ants to a close approximation with the Continental standard.

Fossores.

As might be expected, in so fine a summer and autumn as we have this year enjoyed, fossorial Hymenoptera have been more plentiful than in any season since 1860; but still their numbers are very small, when compared with those of years previous to the above date; no one but an Hymenopterist can form a correct idea of the present scarcity of Hymenopterous insects generally, as compared with former years. The *Pompilidæ* appear to me to have been more diminished than any other family; in the most favourable situations, and under the most favourable circumstances, but few are to be found; a period of some years, I fear, must elapse ere we shall again see these interesting insects in their former abundance. From the north, I have the testimony of Mr. Bold, who says, "Of Fossores, I have only taken the enclosed (*Gorytes 4-fasciatus*) and *Mimesa bicolor*." This refers to the entire season.

Methoca ichneumonides.—Of this rarity, two females and one male were taken at Bournemouth. This insect is the only British representative of the extensive family *Thynnidæ*; the metropolis of the genus appears to be Australia, in which country, Mr. Bakewell found them parasitic upon Lepidoptera; we know not, however, if all the species are so; it would be a most interesting discovery to ascertain upon what insect our *Methoca* is parasitic; it is a widely distributed insect, having been captured, to my knowledge, in the Isle of Wight, in Hampshire, in Essex, Surrey, Suffolk and Dorsetshire.

Pompilus rufipes.—This elegant species has been taken in some numbers, on the coast near Poole, where, for the first time, I observed it to prey upon spiders.

Evagethes bicolor.—Of this extremely local species, a fine

series of both sexes were taken at Bournemouth; it may be found on most of the heaths in that neighbourhood; it is extremely active, and somewhat difficult to capture.

Mellinus arvensis.—This is one of the most abundant members of the tribe Fossores; its usual habit has been repeatedly published; it preys upon flies, and may be commonly observed resorting to the droppings of cows, in search of its prey; it is one of the most wary and talented of all its fraternity; were it at once to attempt, by a sudden leap, to dart upon its victim, ten to one it would fail to secure it; no, it does no such thing, it wanders about in a sort of innocent, unconcerned way, amongst the deluded flies, until safe opportunity presents itself, when its prey is taken without any chance of failure; such is its ordinary mode of proceeding. At Bournemouth, the flies are more active, more difficult to capture, or have they unmasked the treacherous *Mellinus?* and it is found necessary to adopt some fresh contrivance in order to accomplish its ends? if so, it is not deficient in devices. I noticed once or twice, what I took to be a dead specimen of *Mellinus*, lying on patches of cow-dung; but, on attempting to pick them up, off they flew; I at once suspected the creature, and had not long to wait before my suspicions were confirmed. Another, apparently dead fellow, was observed; and there, neither moving hand or foot, the treacherous creature lay, until a fine specimen of a blue-bottle ventured within its grasp,—active as any puss, t *Mellinus* started into life, and pounced upon its victim.

Vespidæ.

So many reports of the scarcity of wasps have appeared, and so many private communications have I received to the same effect, that we may conclude (I think, correctly) that any counter report is only a slight exception to a general rule. No one is surprised at these reports, because they all indicate a feeling of astonishment that such should be the case, when the appearance of females in unusually large numbers in the spring is at the same time referred to, in almost every report; my own observations coincide precisely with these notices. Mr. Stone, our most eminent Vesparian, has published his report, and it proves to be confirmatory of the general character of observations that have appeared upon the subject. From Newcastle, Mr. Bold writes, "Female wasps were exceedingly abundant in the spring, but they suddenly disappeared about the second week in May." I have a similar account from Mr. H. Doubleday, of Epping.

Of the few notices that I have seen of an opposite experience, one is before me from Mr. C. G. Barrett of Haslemere, who writes, "Wasps have been sufficiently abundant here all the season. In the early part of summer they frequented the shops in swarms; although that has not been the case so much lately, it has only been from the abundance of fruit of all kinds, which has furnished them with plenty of food. They have attacked the apples, pears and plums, and have abounded all the autumn on the blackberries; the crop of mulberries has been almost entirely destroyed by them; they have been a complete nuisance at the sugar placed on trees to attract moths. At the same time hornets have been vastly more common than I recollect to have seen them before."

This latter report shows, that, although the scarcity of the *Vespidæ* has been very general, it has not been universal; we are, however, at a loss to understand the cause of this; their scarcity cannot be attributed to prevailing wet or cold weather; the spring was dry and warm. If I were to seek for the cause in such facts as have presented themselves

to myself, I should attribute the scarcity to a prevailing epidemic, but somewhat local in its visitation. Last year wasps abounded at Bournemouth, I never observed more in a given locality; this was in the month of August, at the end of the month they suddenly disappeared in a great measure; their nests were numerous, I therefore dug up several; the majority contained combs of dead brood, some in such a state of putrefaction, that larvæ of *Silphidæ* were attracted, and were feeding upon them; this was, I imagine, just a case of foul-brood amongst wasps; an infection well-known to bee-keepers as most fatal in its results.

During the present season, I have not found a single wasps-nest, and have not seen more than twenty wasps, and it must be borne in mind that I passed a whole month in a most favourable locality in Hampshire,—the month of August, when these insects usually appear in great numbers. I noticed about half-a-dozen in North Devon, at Lynmouth, in the month of October, on days so suitable, and in situations so favourable, that if a single member of the fraternity existed in that county, I might have expected to find it there.

One of the most local wasps occurring in this country is the *Eumenes coarctata;* this was found in considerable numbers at Bournemouth, flying over, and occasionally alighting upon the flowers of the heath; many specimens of the female were obtained by watching spots where the soil was suitable for building their little globular nests, which they usually attach to the twigs of the Heath.

Apidæ.

Notwithstanding the two fine summers that we have enjoyed in succession, many species continue to be extremely scarce: species of *Andrenidæ*, that were formerly most abundant round London, appear to be altogether gone from the locality. Mr. Bold writes, "solitary bees appear to be utterly extinct, or nearly so; the only ones I have seen during the whole summer have been a straggling *Halictus* or two; brown *Bombi* continue scarce, but *B. lucorum, lapidarius,* and *hortorum* are rather plentiful"—as regards the appearance of the spring species of *Andrenidæ*, my own experience tends very much to confirm Mr. Bold's observations, but only as regards the majority; some species were tolerably numerous last spring, *Andrena Trimmerana* is an example. The summer species appear to have recovered, in a considerable degree, the enormous reduction of their numbers which took place in 1860-61.

Sphecodes subquadratus.—This extremely local species was taken in some numbers at Birch Wood in July last; since the year 1849, I had not met with this insect; the capture of a rare bee is now so much a novelty, that any new locality for one is well worthy of being recorded.

Halictus prasinus, a very local species, but extremely abundant at Bournemouth and its vicinity; I never saw an example from any other locality; August is the time of its appearance; the species does not appear to be known on the Continent.

Tenthredinidæ.

Cræsus septentrionalis.—In the first volume of the "Entomological Magazine," p. 313, is a notice of the larva of this insect; Mr. E. Doubleday there records the appearance of the larvæ in abundance on the hazel in July and August; they were so numerous, that young hazels were nearly stripped of their leaves by them; but, he adds, although the larva are sometimes so abundant, yet I have rarely found the perfect insect. In the beginning of August last, namely the

sixth, I found the larvæ in some numbers feeding upon the alder, near Poole, in Dorsetshire; the larvæ all fed up by the 20th of the month, and buried themselves in mould in a flower-pot; about the middle of September they began to appear in their imago state, and by the end of the month all were developed; I succeeded in breeding twenty-two specimens.

In the work above referred to, a coloured figure of the larva is given, and which is said to be one of extreme accuracy; as this differs materially from those which I found, I add the following description:—

Description of the larva of *Crœsus septentrionalis*.—The caterpillar, when full grown, one inch in length:

Livid-green; the head black; ten narrow transverse stripes on the back; with eleven round black spots on the sides, and a double row of ovate ones outside the black spots; a triangular black spot above, at the apex of the body; tinted with yellow towards the head, and also towards the apex. With three pairs of articulated legs, and six pairs of fleshy prolegs.

In the "Annual" for 1864, I have reported the capture of *Hemichroa Alni*, in company with *Eriocampa ovata*, and I there stated that all the examples that I had seen of the former insect were males; such I had really believed them to be; the fact of this species being furnished with two setiferous appendages, which in some species characterize the males, misled me; my friend Mr. M'Lachlan detected the error; I therefore take this opportunity of rectifying as far as possible this egregious oversight. All the specimens of *Hemichroa* that I have seen are females; this leaves the problem as to the male of *Eriocampa ovata* just where it was; the female is a common insect in this country as well as on the Continent, but no one appears to know the male.

In 1864, I collected a large number of the larvæ of *Eriocampa*, and in the spring of the following year bred as many as fifty flies, but all proved to be females. How true indeed are the words of the wisest of Israel's kings, "*Hardly do we guess aright at things that are upon earth, and with labour do we find the things that are before us.*"