

HYMENOPTERA.

NOTES ON HYMENOPTERA.

BY FREDERICK SMITH.

If the question should arise in the mind of any Entomologist, of what possible utility can the record of the abundance or scarcity of any tribe of insects registered year after year be? I would at once reply, of the greatest use; forming, as it does, a most important phase in the natural history of the insect world. There can be no doubt, I presume, in the mind of any one, of their scarcity or abundance being regulated by an all-pervading wisdom, and that one cycle of their scarcity, through which we are now passing, excites our wonder simply because it has not been paralleled by any seasons that have passed in the remembrance of living Entomologists.

The cause of the scarcity of the Aculeate tribe of *Hymenoptera* is, I think, easy of solution: during the summer and autumn of 1860 there scarcely occurred two succeeding days of fine weather. The season of 1860 is thus recorded in the "Annual" for 1861: "Having arrived at the close of a year during which we have scarcely enjoyed a day either of summer or autumnal weather, properly so-called, is it not highly desirable that the results should be recorded?" A season such as is here indicated must operate most fatally on the Aculeate *Hymenoptera*. During rain, neither bees,

wasps, or fossorial insects, are able to pursue the business of their economy; when a long succession of ungenial days occur, numbers of the *Hymenoptera* must inevitably perish. I have never observed any apparent diminution in the numbers of *Hymenoptera* after a severe frosty winter. Winters during which periods of unseasonable mildness occur, sufficiently so to rouse insect life from its torpidity, followed by severe frosts, act undoubtedly most prejudicially on *Hymenoptera*. Some years ago I found a number of *Diptera* frozen stiff and covered with hoar-frost, so brittle as to break with the slightest touch; yet, on being very gradually thawed, they became perfectly active and vigorous.

I have also exposed the larvæ of *Anthophora acervorum* to a night of sharp frost in the month of January, yet these were not in the slightest degree affected by it, or retarded in their development.

A combination of the causes enumerated, which commenced with the season of 1860, have, for longer or shorter periods, continued up to the present time. The consequence now is, that one family of *Hymenoptera*, the *Andrenideæ*, or spring bees, have almost entirely disappeared from the vicinity of London. These bees, formerly seen each succeeding spring in multitudes on all the early spring flowers, are no longer observed; the fields and banks are covered as formerly with flowers, but there are no bees to collect their sweets. Previous to the year 1860, I have frequently captured, on a single fine day in the month of May or June, thrice as many *Hymenoptera* as I have observed during the entire season of 1863!

Notwithstanding the temporary disappearance of our favourites, I feel confident of their re-appearance; I cannot possibly persuade myself that any of the species now preserved in our cabinets have altogether passed away, although

I have not seen many species during the last five or six years.

The social species of bees and wasps have suffered much less diminution in number than the solitary ones, particularly such as construct nests underground; those Humble Bees that build on the surface have become extremely scarce—I have not observed half-a-dozen during the past season.

Bombus lapidarius, *B. terrestris*, *B. hortorum*, *B. subterranea*, and *B. lucorum*, have all appeared in increased numbers; I observed all these species in Kent, Surrey, Suffolk and Dorsetshire. Wasps, I have been informed, have been plentiful in some localities, but certainly not in the vicinity of London; nor did I observe one during a month's stay in Suffolk; but I was told at Wareham, in Dorset, that they had been very numerous there: in fact I saw a good many in October, in houses and shops in that town. I was amused to find that common wasps, that is, *V. vulgaris* and *germanica*, are called hornets at Wareham, but of the true hornet, I could not learn that they had any knowledge. I was told that, earlier in the season, they had been troubled with a great number of white wasps, a species of which I certainly have no knowledge. Under stones on the Downs and Purbeck Hills I found several female wasps in a semi-torpid state—I conclude laid up for the winter.

Mr. Eaton, of Blandford, in Dorsetshire, gives a list of *Hymenoptera* captured in that county, several of which I have not seen during the past two or three seasons: *Tiphia femorata*, at Blandford; *Crabro dimidiatus*, at Studland; *Osmia spinulosa*, at Lyme Regis, and *Bombus subterraneus* and *Apathus rupestris* plentiful at Blandford.

We thus find some species that have become apparently extinct in old localities, still appearing plentifully in new ones. Such occurrences are noteworthy, and lead us confi-

dently to expect, that from their present centres, they will spread generally, and again become as abundant as ever in situations best adapted to the habits and requirements of the species.

No locality that I have visited has proved more prolific in species, or has produced more rarities, than the neighbourhood of Lowestoft, in Suffolk: five years ago, both in number of species and in rarities, I found that district unparalleled. During the past season I could not find a solitary example of several species that formerly occurred in profusion. Finding this to be the case in old localities, I determined upon trying new ones, but the scarcity I found was general. One instance of good fortune resulted from the change. On the 27th of July, I was sweeping for *Coleoptera* in Carleton Wood, about four miles from Lowestoft, and on beating a quantity of *Vicia cracca*, I observed what I took to be a species of *Pompilus*,—its mode of running was exactly that of a species of that genus. I secured it, and on examining it more carefully at home, I discovered that I had captured the rare *Didineus (Alyson) lunicornis*. That this is an exceedingly rare species there can be little doubt; it was my first capture of the genus. In the thirteenth volume of "Curtis's British Entomology" the first record of the capture of *D. lunicornis* in this country is found; the specimen taken was a female, at Hastings, by Mr. Curtis himself. Subsequently, the Rev. G. T. Rudd took both sexes at Ryde, in the Isle of Wight in 1836. I am not aware of any others having been captured.

The discovery of another rarity remains to be noticed; it was made by myself. Whilst sketching the ruins of Corfe Castle in Dorsetshire, a strange looking male ant alighted on my sketch-book; I therefore secured it, and to my great delight it proved on examination to be a male of *Myrmica lippula*,

the first and the only specimen I have seen; it is readily distinguished from all other species by the elongate peduncle of the abdomen; it does not appear to have been previously captured by any one, no author has certainly described it. This small species of ant belongs to the genus *Tetramorium* of Mayr, distinguished by having 4-jointed maxillary palpi, the labial palpi being 3-jointed. This ant I do not think constructs a nest of its own, but, as is the case with two or three others of these small species, lives in the communities of other ants; I have several times found *Tetramorium lippula* in the nest of *Formica fuliginosa*, other Entomologists have also found it in the nest of the same ant. Last year I found this species in some abundance in and in the vicinity of a nest of *Formica rufa*; the rare *Stenamma Westwoodii* inhabits the nest of the same ant, as well as *Myrmica muscorum*; the latter species is found in many parts of the continent, but has not hitherto been observed in this country, but I feel satisfied that it only wants well hunting for in different localities in order to add it to our fauna.

The last capture that I have to notice is an important one in some respects, as it appears to me to throw a light upon a subject that has long perplexed Hymenopterists. Professor Boheman once asked me if I knew the male of *Eriocampa ovata*; this *Tenthredo* is very abundant in many situations where alders are growing, the larva feeding on the leaves of that tree, and in such situations I have frequently taken it; all the specimens however that I have either taken myself, or seen in collections, have been females; my answer to the Professor's question was therefore in the negative. During the month of August last I met with *Eriocampa ovata* in plenty, near Lowestoft; both larvæ and perfect insects were numerous;

on one occasion I was watching several females wandering sluggishly over the alder leaves, when a strange looking individual was observed amongst them; its motions were equally sluggish, its difference in coloration alone distinguished it; on securing the specimen it proved to be a male insect, well known to me, and described by Stephens by the name of *Hemichroa Alni*, the *Tenthredo Alni* of Linnæus; all the examples, that I have captured, or seen, have been males; the question therefore to be answered now is, can the *Hemichroa Alni* possibly be the male of *Eriocampa ovata*?

The neuration of the wings in *Eriocampa* is so very different to that of the genus *Hemichroa* as to justify fully their generic separation; both genera agree in having one marginal and four submarginal cells, but in *Eriocampa* the two recurrent nervures are received, the first in the second submarginal cell and the second in the third cell, whilst in *Hemichroa* both the recurrent nervures are received into the second submarginal cell. This great and important difference in the neuration of the wings of these insects, compels me to hesitate in expressing a very decisive opinion of their really constituting one species; great as is the otherwise general resemblance between them, both have a red thorax, and in their general form, &c. have a close resemblance; both exhibited the same sluggish manner when observed on the leaves of the alder, and I found no other species of *Tenthredo*, in the same locality, that could possibly have any affinity with either.

In order to settle this question, if possible, by direct observation, I collected a large number of larvæ; they soon became full grown and then buried themselves in a pot of earth, from these I hope to obtain the sexes. The difference of neuration is the only apparent obstacle to a complete settlement of the
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question, and it is so great as to be of full generic value in the family of the *Tenthredinidæ*; remarkable differences in the neuration of the wings in the *Lepidoptera*, in the opposite sexes of the same species, have been pointed out to me by Mr. Bates, who ascertained their identity as one and the same species by direct observation; some of these remarkable discrepancies occur in the family *Heliconidæ*; the genera *Sais*, *Mechanitis* and *Ithoma* containing such examples. A strikingly different neuration of the wings of the sexes occurs in the *Hymenoptera*, in the genus *Myzine*; the genus *Plesia* is now ascertained to contain the females. Admirable as is the wing system in consequence of the facility which it offers in generic determination; still, like all other systems, it fails to prove infallible.

An instance of parasitism, observed by Mr. Butler of the Zoological Department of the British Museum, I believe, has not been previously noticed; on an excursion to Ventnor, in the Isle of Wight, he collected a number of the capsules of *Iris fœtidissima*, in the hope of breeding the local Curculionidous insect *Mononychus Pseudacori*; he succeeded in doing so, and also an *Ichneumon*, apparently belonging to the genus *Sigalphus*, but unknown to Mr. Walker, who is so familiar with the family to which it belongs; I am not aware of any species of *Sigalphus* having been observed to be parasitic upon the *Curculionidæ*.

With the foregoing notices I have finished my report of all that has come to my knowledge, as regards the *Hymenoptera*, necessary to register in this year's Annual; it had not been a very difficult matter to have extended it had I been inclined to mix up a little romance with reality; a spice of the former article would no doubt have rendered my notes more piquant and attractive to the general reader;

but "they manage these things better in France." A paper that, in my opinion, is rather highly flavoured with the above mentioned quality, so charmed a friend of mine, that he was induced to publish an abstract of it in the "Dublin Natural History Review," entitled "The Works of M. Fabre." A short summary of that part of the paper which treats on the habits and metamorphoses of *Sitaris humeralis* will be a fair example.

The larva of this beetle is parasitic upon *Anthophora acervorum*, and, in general form, is very like the little hexapod found so frequently on wild bees, named *Pediculus Melittæ* by Mr. Kirby; possibly it may be identical; both Mr. Newport and myself were quite satisfied that it could not be the larva of a *Meloe*. The larvæ of *Sitaris* are active little creatures, and traverse the burrows leading to the cells of *Anthophora*, and on the bees issuing from the cells, cling to them as they pass along the galleries; on the bodies of the bees they remain until such time as the bee has formed a fresh cell, provisioned it with pollen and honey, and thereon deposited an egg. At the very moment of the latter operation being performed, M. Fabre tells us, the *Sitaris* larva, watching its opportunity, springs from the body of the bee and alights on the fresh deposited egg; here, we are told, it floats on the surface of the liquid honey, the egg not only serving as a repast, but also as a raft. After eight days the egg is consumed, and on the empty shell, as in a boat, the *Sitaris* undergoes its first transformation; it now changes into a white fleshy grub, so organized as to float on the surface of the honey. This certainly is all very circumstantial, and when we reflect upon the dangers to which the little mariner is exposed, we feel quite a sensation of terror and alarm for its safety; an unlucky lurch on the part of the *Sitaris*, when

undergoing its first transformation, must eventuate in the shipwreck of the little innocent; thus doomed to die, but surely the sweetest of deaths.

After its first change the larva is no longer in danger of submersion, being so organized as to float upon the surface of the honey in perfect security.

I will now point out the measure of romance that appears to me to be mixed up in this short history. At various times I have obtained cells of *Anthophora acervorum*; cells freshly provisioned by the bee, others with the undeveloped eggs resting upon it; many containing the larvæ, in all stages of progress;—and what were the cells provisioned with? pollen paste, as Mr. Newport calls it; stiff paste on which either the larva of *Sitaris*, or that of the bee, might rest in perfect security; in fact quite as safely as if placed upon an unbaked loaf or biscuit; floating is quite impossible, or certainly would have been so in every cell of *Anthophora* that I have inspected.

But there is another remarkable circumstance to be noticed: M. Fabre tells us, that the *Sitaris* larva floats on the honey in the empty shell of the egg of *Anthophora*; I have not only seen the egg of *Anthophora*, but also those of many other species of bees; the egg of *Anthophora* has no shell; the egg of a bee, instead of a shell, is outwardly enveloped in a skin of so delicate a texture, so exceedingly thin and transparent, and so extremely flexible, that I do not know anything with which to compare it; this delicate skin, once pierced, certainly could not answer the purpose of a raft or float.

My own observation therefore leads me to the conclusion, that amidst much truthful observation, enthusiasm has grafted a certain amount of romance; but it is well observed

in the paper alluded to in the "Dublin Review"—"In some cases, indeed, we may feel disposed to think that M. Fabre's enthusiasm leads him to attribute to his favourites, feelings of which we can hardly suppose them capable."