

wax and propolis, but by the turning in of the upper part of the cell. Then again, in contrast to *Apis mellifica*, the stingless bees destroy the cells after the imagines have hatched out, the ruins of the cells being placed on a rubbish heap, although they may be used for some other purpose. The mass of refuse is only removed by degrees when the heap becomes too large to remain. The honey cells undergo a similar fate, for they are pulled down when empty and built up again. Müller suggests the presence of fungi as an explanation of this peculiar, and apparently unnecessary, procedure. The increase of stocks is obtained artificially by the natives.

There is a great difference between the various species in—(1) Character. (2) Size. (3) Scent. (4) Mode of flight. (5) Build of nest. Some are easily awed and frightened, others are exceedingly vicious, and never say "die." The latter attack larger bees and wasps, killing them by biting them in two. When they are attacked, or attack man, they emit a strange and obnoxious scent, producing often sickness and even giddiness. Some are bad thieves and steal the gathered pollen, or propolis, from one another, even off their opponent's legs. As regards the bite, which can be very severe, a burning and throbbing sensation commences after some hours, and next day a blister, surrounded by a darkened line, appears, the latter remaining often for weeks, in the case of the bite of *Trigona flaveola*. Smoke will not pacify them, but being placed for several hours in a cold cellar will often have the desired effect. The habits of the bees we have been discussing refer to those of various species of wild bees of North and South America, which are indigenous to these countries, whereas *Apis mellifica* is not. The latter has, however, to some extent, displaced the stingless bees, and has maintained itself wherever it has been introduced, especially in civilised countries. It has not only done this, but it has yielded to the beekeeper and others rich harvests of honey, and has increased to no small degree the character of the flora of those parts. Living in many cases in America in a wild state, side by side with the native bees, *Apis mellifica* is said by Drory to be afraid of *Trigona* but to live peaceably with *Melipona*. The honey of the latter bees is also vastly inferior to that of the honey-bee, and it is a question of some importance as to how honey keeps without formic acid. Doubtless the wax, which is not, as in the case of *Apis mellifica*, secreted by the ventral plates, but dorsally, is not nearly so good or useful as ordinary bees-wax; this is shown by the fact that *Apis mellifica* is cultivated by the priests for the purpose of getting bees-wax.

I feel sure that if the reader has followed me carefully he cannot fail to see that domestication under these circumstances is quite out of the question. I believe that we have shown that the beekeeper cannot benefit to any extent, financially or otherwise, by keeping the stingless bees, but that, on the contrary, better results can be obtained by cultivating *Apis mellifica*, and keeping up a high standard and healthy race, and this ought to be our aim.

Genera of the Eumorphid and Daphnid Sphingids.

By J. W. TUTT, F.E.S.

In continuation of my previous notes (*antea*, pp. 75-76) on this subject, I now offer (thanks to Mr. Kaye) the descriptions of three

more genera, one of them, *Lilina*, an Eumorphid genus, the two others Daphnid.

Head rather prominent and projecting. Antennæ of almost uniform thickness throughout in both ♂ and ♀, the tip very pointed and sharply hooked. Legs long and slender, with closely compressed hairs on tibiæ; spines on tibiæ most developed on median pair. Forewing long and narrow, straight, to just before apex; outer margin almost straight; inner margin very slightly curved after leaving tornus. Hindwing long and narrow, the tip particularly so; costa very strongly arched near base; outer margin evenly curved to nervure 1b, where there is a sharp, short, tooth-like projection; upper discocellular greatly curved inwards, the lower nearly straight. On the underside of forewing there is no patch of long hairs on the lower half of cell. Larva with subdorsal row of eyespots developed on abdominal segments 1-8, those on segments 3-8 poorly developed (Weismann, *Studies in Theory of Descent*, transl. p. 195)—*Lilina*, n.g., *pinastrina* (= *bisecta* = *silhetensis* = *intersecta*) [type of genus].

Head large for the size of the moth. Antennæ very strongly hooked, the hook very fine and pointed, and terminating in a long bristly hair. Abdomen slender. Palpi rather short. Legs fairly long and slender, with well developed spines on all the tibiæ; the spurs long, but not so stout as in *Daphnis*. Forewing with costa straight, to well beyond nervure 7, then flatly curved to apex. Outer margin slightly excised to nervure 7, thence flatly curved to tornus. Inner margin considerably upcurved immediately beyond tornus and downcurved before base. Hindwing rather long and narrow, and only very bluntly pointed; the costa rising abruptly from base to about the length of cell, flatly curved to just before apex, and thence very strongly arched. Outer margin curved to nervure 3, and thence to nervure 1b, curved inwards. Nervures 6 and 7 stalked. Discocellulars almost in straight line—*Regia*, n.g., *torenia* (type of genus).

Head long, very projecting; antennæ with a long produced tip. Forewing with costa slightly arched to well beyond nervure 7, thence strongly curved to apex which is very acute and prolonged. Outer margin greatly excised to nervure 6, where it is bluntly angled, thence straight to nervure 3, again bluntly angled and straight to tornus. Inner margin greatly upcurved from tornus and strongly downcurved before base. Hindwing broad and short; the costa boldly curved and immediately before apex particularly so. Nervures 6 and 7 from upper angle of cell; nervure 8 almost evenly curved from base. Legs short and stout with moderate spurs. Spines on tibiæ weak and obscured with hairs. Abdomen short, stumpy, with a broad fan-shaped anal tuft in ♂—*Indiana*, n.g., *bhaga* (type of genus).

Structurally this genus (*Indiana*) appears to agree rather with the Philampelids than the Daphnids. It may be the Old World representative of the Philampelids (Kaye, *in litt.*).

PRACTICAL HINTS*.

Field Work from Middle of April to Middle of May.

1.—*Spilonota pauperana* may be taken in its very restricted haunts during the latter part of April, and, in backward seasons, until the middle of May. It is not a free flier, and is most readily obtained by beating rose, on the bloom of which its larva feeds. A fairly mild and calm day must be selected when working for the species, as with an east or north wind it is well nigh impossible to induce a moth to move.

2.—Catkins of willows and aspen, which easily fall when the bushes or trees are shaken, should be collected, and will, in due time, give a varied series of *Grapholitha nisana*. The catkins should be placed in

* "Practical Hints for the Field Lepidopterist," Pts. I and II, each contain some 1250 practical hints similar to these. Interleaved for collector's own notes. Price 6s. each part.



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