

perceptible reticulation. *Caterpillar at birth*: Bristles of body not spiculiferous, apically enlarged or flaring. *Mature caterpillar*: Body naked except for scanty and excessively short almost microscopic hairs, occasionally provided with fleshy filaments. *Chrysalis*: With a pair of frontal projections, hanging freely by tail and mid-girth only.

Family HESPERIDAE.

Tribe HESPERINI.

Butterfly: Tail of antennal club nearly or quite as long as club proper; abdomen generally shorter than hind wings. Males with a costal fold on fore wings concealing special scales, and with a corneous sheath protecting the extended alimentary canal. *Egg*: Sub-spherical, vertically ribbed and cross lined. *Caterpillar at birth*: Bristles of last segment only a little longer than the others, not recurved. *Mature caterpillar*: Body relatively stout and plump; highest points of the two sides of the head more distant from each other than the length of the base of the frontal triangle. *Chrysalis*: Tongue case not protruding beyond the tip of the wing cases.

Tribe PAMPHILINI.

Butterfly: Tail of antennal club shorter than the club proper, occasionally wanting; abdomen as long as or surpassing the hind wings. Males often with a velvety oblique streak on the

disk of the fore wings, the alimentary canal not prolonged. *Egg*: Usually subhemispherical, with smooth or obscurely reticulate surface. *Caterpillar at birth*: Some of the bristles of last segment exceptionally long and recurved. *Mature caterpillar*: Body very elongate; highest points of the two sides of the head no farther apart than the length of the base of the frontal triangle. *Chrysalis*: Tongue case free at tip, protruding beyond the wings.

A SIMPLIFIED SPREADING BOARD.

Some entomological friends who have visited my laboratory recently have been unexpectedly interested in a means of setting and spreading the wings of insects that I have employed for a good while, and have asked that I should describe it. I am constrained to do so, not because the old form of grooved board with cork backing is unsatisfactory, but because my board is simpler, cheaper and can be made in a moment by any one. It is better, too, in some respects and for some kinds of insects, and I now use it almost altogether.

It consists of a thin piece of smooth board of soft wood with rows of awl holes punched through it, fastened flatwise upon another thin board of the same size. That is all there is to it. The piece with the holes in it should be of a thickness equal to one fourth the length of the pin.

To use, the pin is thrust through the insect nearly to the head, inverted, and pushed head downward to the bottom of one of the holes, and the wings are expanded and pinned down under strips of paper in the usual way, but in the inverted position.

Its advantages over the old, grooved board are:—

1. Its cheapness and compactness.
2. It can be readily made of any size or shape.
3. It will hold twice as many insects for a given area.
4. It automatically places the specimen at the proper height on the pin.
5. Less time is required to set an insect, because the body does not have to stand in a definite relation to a groove.
6. Legs, antennae, abdominal stylets, etc., tend to lie out flat on the board, and do not

hang down in the way of pin labels: the legs are readily arranged with great advantage for seeing tibial spurs, etc.

It has its limitations in the setting of insects with dorsal crests, or with dorsal tufts of hairs, which are not to be flattened out.

The simple expedient of turning the insect over for setting obviates the necessity for the groove: and after spreading on an undivided surface for a while, one comes to regard the groove a nuisance.

James G. Needham.

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—XXXVIII.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Palaecrita vernata Peck. This well known larva, first described by Peck in 1796 and referred to in all works on economic entomology, occurred in the Platte Canyon, Colorado, numerous on a bush of wild cherry, which was defoliated. The larvae were not seen elsewhere and were massed on one tree, not scattered as was *Alsophila pometaria*, which occurred in the same canyon.

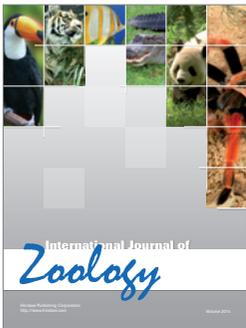
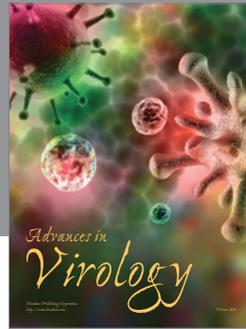
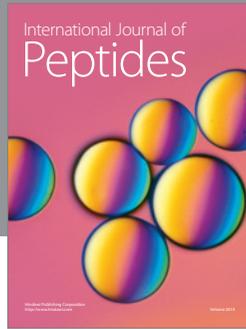
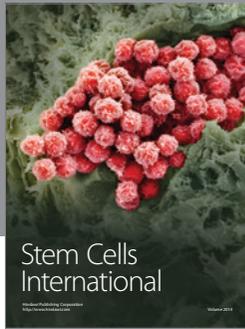
Egg.—Elliptical, evenly rounded, one diameter considerably less but not flattened; one end slightly depressed, the other rather distinctly truncate; reticulations broad, rounded, rather ill-defined, the cell areas however forming distinct saucer shaped pits in longitudinal rows; truncate end nearly smooth; sordid yellow, subtranslucent, appearing soft-shelled, sometimes irregularly shaped, somewhat iridescent; size $.8 \times .6 \times .5$ mm. Laid in a mass probably in a crack in the bark or similar situation.

Stage I.—Head rather small, rounded, flattish before, not higher than joint 2; dull dark brown, epistoma and setae pale; width about .3 mm. Body normal, rather robust, not elongated; a broad dark brown subdorsal

band and narrow dorsal line, the whitish space between irregular and cut by the annulet incisures; subventral fold broadly pale; venter shaded in brown but leaving the tubercles pale. Feet shaded in luteous brown, normal; setae short, white, rather stiff.

Stage II.—Head bilobed, erect, flat before, dull black, whitish across the clypeus, in a streak each side and on epistoma; width .4 mm. Body normal, rather short and thick, a little flattened. Black, not shining, subannulate. A geminate, white, dorsal line, slightly dotted and broken, irregular; a fine white lateral line, near to, and partly joined by obscure streaks to a broad white line on subventral fold, streaked on the annulets; spiracles in white patches; a few white dots subventrally. Feet dark, the abdominal ones white streaked outwardly, the thoracic ones pale in the joints. Joint 12 slightly angularly enlarged dorsally. Setae short, black, rather stiff.

Stage III.—Head bilobed, erect, flat before; luteous brown to black, with two transverse, dotted, white streaks, one at the apex of clypeus, the other between the eyes; epistoma pale; width .6 mm. Body moder-



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