

preoesophageal, why may we not have in arachnids a condition in which even the tritocerebrum has assumed this position? Indeed, the acceptance of Jaworowski's work as demonstrating the presence of vestiges of true first antennae leaves us no other alternative.

The evidence therefore goes to show that while in the insects the first pair of antennae is retained throughout life, in the arachnids it is the second pair which is represented by the chelicerae. In both groups the missing pair may be present in the form of embryonic vestiges.

WORKS CITED.

1816. Savigny, J. C. Mémoires sur les animaux sans vertèbres.
1829. Latreille, P. A. Les crustacés, les arachnides et les insectes.
1848. von Siebold, C. Th. Lehrbuch der vergleichenden Anatomie der wirbellosen Thiere.
1852. Blackwall, J. Experiments and observations on the poison of animals of the order Araneida. Trans. Linn. Soc. XXI.
1880. Balfour, F. M. Notes on the development of the Araneina. Quart. Journ. Micr. Sci. XX.
1885. Pelseneer, P. Observations on the nervous system of Apus. Quart. Journ. Micr. Sci. XXV.
1891. Jaworowski, A. Über die Extremitäten bei den Embryonen der Arachniden und Insecten. Zool. Anz. XIV.
1892. Simon, E. Histoire naturelle des Araignées. I.
1893. Viallanes, H. Études histologiques et organologiques sur les centres nerveux et les organes des sens des animaux articulés. 6e Mémoire. Ann. Sci. Nat. Zool. (8) XIV.
1899. Janet, C. Sur les nerfs céphaliques, les corpora allata et le tentorium de la fourmi (*Myrmica rubra* L.). Mem. Soc. zool. France, XII.

GROUP CHARACTERISTICS OF SOME NORTH AMERICAN BUTTERFLIES — I.

BY SAMUEL H. SCUDDER, CAMBRIDGE, MASS.

Some years since I announced as in preparation a Student's Manual of North American Butterflies, north of Mexico, and a fragment of the same was published in 1892 (Proc. Amer. Acad. Arts Sci., XXVII) under the title, The tropical faunal element of our southern Nymphalinae systematically treated. Owing

to other demands upon my time progress upon this Manual has been very slow, and I am now compelled to abandon the project. Such few portions as are in any way complete, mostly written ten years or more ago, I bring together in the following series of papers, in the hope that their publication may be of some

service to the student who may undertake the task I abandon. It is only in the first two subfamilies that genera and species are considered, and I have therefore adopted for this collection of fragments the title given above.

Subfamily EUPLOEINAE.

Butterfly: Palpi stout, tufted with hairs. Antennae naked, arcuate, the club drooping, tolerably well marked. Fore legs of both sexes excessively atrophied, short and nearly naked. Fore wings long but ample; none of the nervures swollen at the base; internal nervure present; discal cell of hind wings long

and closed by an interrupted vein; costal nervure terminating at middle of costal border. Abdomen unusually long and slender, the males with anal tufts of protrusile hairs. Colors of wings generally massive and generally very similar above and beneath. *Egg*: Sugarloaf shaped, considerably higher than broad, truncate and scarcely rounded at base, with slight vertical ribs and small cells at the outer borders of the crown. *Caterpillar at birth*: Head no larger than segments following. Body cylindrical, uniform, unicolorous; ranged appendages simple tapering hairs usually shorter than the segments.

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE. — XXXIII.

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

Endropia duaria Guenée.

Egg. Laid loose, rolling. Elliptical with only traces of the side flattenings and end truncation, smooth, somewhat like hens eggs though more evenly alike at the two ends. Reticulations absent, represented only by the angle pores which are arranged in fine hexagonal pattern and look like light dots in the shadows. All pale yellow. Size $.9 \times .55$ mm. They turned bright red in a day or two and black before hatching.

Stage I. Head rounded, erect, free; sooty brown black, the clypeus, a little dot each side and epistoma white; width .4 mm. Body moderate, normal with rounded wing-like elevations laterally on joints 5 to 9. Purple black with five dotted, transverse intersegmental white bands on joints 5 to 9 anteriorly, cut by narrow dorsal and lateral lines of the ground color; a few whitish dots on

joint 13 anteriorly. Bands narrowed to obsolescence ventrally; feet dark.

Stage II. Head vinous brown, a bright white spot in the clypeus, two on each side, one on base of antennae, base of labium and a small geminate one on face of lobe; width .6 mm. Body, robust, a little inflated centrally, a round prominence, bearing tubercle iv, most distinct on joints 5 and 6. Ground color sordid brown, mottled and faintly longitudinally lined in darker and with streaks of pale dottings; two oblique white spots subdorsally anteriorly on the segments, one before the dark vinous spot covering tubercle iv, elongate and obscurely trilobed; ventral streaking irregularly brightened into nearly white. Tubercles and setae obscure.

Stage III. Head rounded, squarish, broad, lobes full at vertex, flat before, erect. White, heavily black mottled over lobes, leaving a

