the whole side gray tinged and the borders of the dorsal stripe of clear color outlined by gray touches; a dorsal line of clearer color indicated on the anterior joints; between joints 3 and 4 and between 4 and 5 on the dorsum a yellow transverse stripe that is hid when the larva is at rest; the head is less distinctly marked than at the other stage; the lateral fringe pink tinted. The dorsal stripe is more of a distinct red than the general ground color.

An interesting parasite was bred in this stage from one of these larvae, but at the time of writing it is misplaced so that I can not now say what it is. Its manner of pupation was as follows: When ready to spin its cocoon it burst open the under side of the host so that the skin of the dead Heteropacha larva formed a cover for the upper side of the cocoon. The ends of the dead larva were shrunken, but the middle where used as a cover for the cocoon was three times as broad across as the living larva had been. The pupal period of the parasite was 8 days, from May 20 to May 28.

Last stage—Length, 1.05 inches. Striped with 7 yellow stripes, a dorsal, subdorsal, suprastigmatal, and substigmatal, the first two quite dark almost orange, the other two paler and much narrower. The space between the dorsal and subdorsal black; a white patch between the joints breaks the subdorsal stripe and extends almost to the dorsal. Sides gray. Venter pale yellow, dull, a black patch to each joint. Head black, a short transverse buff streak in front; top of joint 2 black; short hair all over the body but not enough to very much obscure the colors, the hair on the upper part of the body mostly black but that along the sides above the legs gray.

The pupal period of the moth was 15 days, from May 22 to June 6. This was the period of the first one that pupated. Several others were raised but their periods were not noted. They continued to hatch to July 17, some being in the larva state when the first one emerged as an imago.

Smerinthus astylus.—A brood of twenty-four raised this past season, showed some variations from those of last year.

Eggs laid July 29th and 30th.

Hatched—Aug. 8th.

1st moult—Aug 16th.

2nd moult—Aug. 22d.

3rd moult—Aug. 29th.

4th moult—Sept. 5th.

Most stopped eating Sept. 14th, and pupated Sept. 18th to 30th, varying much in length of time required for this change. All these periods were shorter in 1890 than in 1889, except that between 2nd and 3rd moults. But three of the larvae kept on feeding till Oct. 15th—one dying just before that date. There was much greater variation in color in this brood. Twenty were much more marked with red than those of last year, while four had no red, even on the caudal horn! Three of these four were the three which continued feeding after the others had pupated. Every one lost the “bifid tip” of the caudal horn so that, in the last stage, no one could imagine that it had ever been bifid. Ida M. Eliot, Caroline G. Soule.

Prothoracic Wings.—M. Charles Brongniart of Paris has just published in the Bulletin of the Société philomathique two plates representing three insects, differing considerably in structure, found in the rich carboniferous beds of Commentry, France, two of which show, besides fully developed meso-
thoracic and metathoracic wings, a pair of prothoracic wings, bearing much the same relation to the others as the mesothoracic tegmina of tropical Phasmidae bear to their metathoracic wings. They are short subtriangular lobes having a well defined basis which is narrower, sometimes much narrower, than the parts beyond, and from which course three or four radiating nervules. Although on these individuals these parts spread laterally like the wings behind them, and are sometimes so broad at base as to appear at first sight rather as lateral lobes of the prothorax (especially in an English carboniferous insect described by Woodward, which Brongniart also places here) M. Brongniart believes that they were movable and could be extended backward along the body, so as to cover the base of the mesothoracic wings. As to the question which naturally arises, whether these members are to be regarded as atrophied organs and therefore presuppose a progenitor equipped with three pairs of fully developed and similar thoracic wings, M. Brongniart prefers to wait for further paleontological facts. One recalls in this connection the discussion between Haase and Cholodkovsky in the Zoologischer anzeiger, Nos. 23, 239 and 244.

A Hint from Embryology.—Mr. Wm. M. Wheeler has enriched entomology by a very interesting and suggestive paper on the appendages of the first abdominal segment in insect embryos (Trans. Wisc. acad. sci., v. 3, pp. 87-140, pl. 1-3). Besides his own observations on Phyllodromia, Periplaneta, Mantis, Xiphidiunr, Cicada, Zaitha and Sialis, he gives a résumé of the observations of others and discusses the probable original function of these appendages among the ancestral insects when they must have extended to postembryonal life. Showing that in view of their origin from the ectoderm they must have been either respiratory organs, sense organs, or glands, he reviews the arguments for each hypothesis pro and con and concludes in favor of the last; he is further inclined to regard them as having probably been odoriferous glands and his ingenious arguments in favor of this view will be found of interest to all entomologists. He proposes for these organs, which he notes to have been found only in the Heterometabola, the name of Adenopodia, a name which demands the acceptance of the glandular hypothesis. Considering the variety that he shows has already been found in the nature of the adenopodia, a fruitful field of investigation is opened, in which there is plenty of room for many workers.

Kolbe’s Introduction to the study of insects is slow in publication. Begun early in 1889, it was to be completed in six or seven small monthly parts. The fifth part has just appeared and the second of the twelve divisions of the book is not half finished, so much more extensive is our author’s performance than his promise. The present part (pp. 225-272) deals with the mouth-parts of the sucking insects and the structure of the wings. In the former, under the bibliography of the Lepidoptera, we miss reference of any kind to either of Edward Burgess’s papers, the most important ever published. In the latter there is no reference to Saussure’s paper on the folding of the wings of cockroaches, but there will be found a good account of Adolp’s views. There are 23 wood-cuts in the text of this part, mostly original.

Dr. Anton Fritsch of Prag, has recently described in Vesmir, a popular Bohemian journal of natural history, the case of a caddis fly from the permian formation, and it may be regarded as the oldest indication of the Phryganidae yet brought to light.

Eggs of Lycaenidae—Doherty of Cincinnati has carried the study of the eggs of eastern Lycaeninae so far as to propose, in the Journal of the Asiatic Society of Bengal for 1889, four divisions to the Theclini, based principally upon characteristics drawn from