erable body of evidence of an embryological, comparative morphological, and endocrinological nature. In certain flying insects, this continuity has been markedly manifest in a well-integrated pattern of postemergence development of the neuromotor mechanism, reflected in the heightened activity of the cholinesterase system, in the enhanced storage of glycogen, and in the increased activity of enzymes concerned with respiration and energy release within the flight muscles. This period of cryptic metachemogenesis, through which the newly emerged adult must pass in order to complete its development, I consider to be, at the very least, a characteristic feature of holometabolous insects.

That a period of metachemogenesis may characterize all insects possessing *any* kind of metamorphic growth is suggested by other recent studies. In these studies (*16*), succinoxidase activity of the thoracic flight muscles in both sexes of the woodroach and in the male American cockroach, insects with gradual metamorphosis, has been observed to rise continuously after the final molt to a maximum by the tenth day of adult life. Moreover, Brooks (*17*) found that changes with age in succinoxidase activity in the basal leg and wing muscles of this insect are correlated with changes in color. In male cockroaches, for example, muscle color is white at the last nymphal molt and changes to pink shortly after emergence. The pink hue, as well as the enzyme activity, then increases rapidly in intensity and reaches a maximum at about 1 month after adult emergence. These findings for insects with gradual metamorphosis correspond closely to those presented earlier for holometabolous insects. They raise further doubts concerning the validity of the taxonomic separation of insects with metamorphic growth into three major categories, an otherwise arbitrary separation based on superficial criteria and with no great phylogenetic significance (*18*).

References and Notes

1. I acknowledge the critical review and suggestions of A. Glenn Richards of the University of Minnesota. Acknowledgment is also made of the kindness of R. E. Snodgrass of the Smithsonian Institution in reviewing the original manuscript of this paper.
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18. A. G. Richards has called my attention to the early (but little emphasized) recognition by V. B. Wigglesworth, *Insect Physiology* (Methuen, London, 1934), p. 41, that different types of metamorphosis are physiologically untenable, that the Hemimetabola and Holometabola represent differences in morphological transformations accompanying molting, and that at the final molt some hemimetabolous (like holometabolous) insects undergo transformations far more extreme than those at preceding molts.

R. W. Marriott, Astronomer

Ross Walter Marriott was born in Paxton, Illinois, on 30 December 1882, and died at Hahnemann Hospital in Philadelphia on 19 October 1955. He entered the University of Indiana in 1902, obtained the bachelor's degree in 1906, and came to Swarthmore College that same year with the late John A. Miller, professor of mathematics and astronomy. Marriott received the master's degree at the University of Pennsylvania in 1911. He taught mathematics at Swarthmore College for 46 years, as an instructor (1907–10), assistant professor (1910–22), associate professor (1922–27), and professor of mathematics and astronomy (1927–52). He took an active part in making the adjustment of, and early observations with, the Sproul 24-inch refractor after it was installed at Swarthmore in 1911.

From 1923 to 1932 Marriott participated with Miller in the Swarthmore eclipse expeditions, and owing to his zeal and care Swarthmore College possesses a collection of fine coronal photographs. In the director's office of the Sproul Observatory hangs an oil painting of Miller and Marriott studying a solar eclipse photograph, painted by the late Owen D. Stephens, well-known artist of astronomical subjects.

Mariott was a perfectionist and was very critical of the results of his own observational efforts. He did not publish the measurements and discussions of some of his best plates, because he was not satisfied with the results.

The definition of Marriott's eclipse photographs is excellent; solar astronomers recognize the value of his large-scale photographs of the solar corona, which he generously shared, together with his unique knowledge about them. Outstanding are his large-scale photographs of the inner and outer corona at the time of the eclipse of 21 October 1930 at Niuafoou, Tonga ("Tin Can Island"), which are of exquisite quality and have been analyzed by several astronomers, particularly for the "jets," or small spicules.

The fruits of his long period of service in the teaching profession and his valuable collection of eclipse photographs remain as a monument to Ross W. Marriott of Swarthmore College.

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