LIFE HISTORY NOTES ON SOME *HEMILEUCA* SPECIES (SATURNIIDAE)

CAPT. MICHAEL J. SMITH
P.O. Box 5111, APO New York, 09286

Ferguson's treatment of the Saturniidae (1971) provided much valuable information for those particualrly interested in *Hemileuca*. He presented certain questions for further study, as he had not enough material on hand to make definite statements. I want to record here some of my experiences in rearing members of this group and provide information that might assist in clarifying some of the shadowy areas. I also would like to add some of my rearing methods and misfortunes in hopes that they will help others to avoid my errors and thus be successful in their initial attempts at rearing the members of this beautiful group.

Hemileuca maia (Drury)

Ferguson mentions the great confusion that exists between the oak eating *H. maia* and the willow eating *H. nevadensis* (Stretch), including the lack of information available to verify the acceptability of foodplants other than *Quercus* for *maia*. In May and June 1972 I reared *maia* from ova received from Irwin Leeuw of Cary, Illinois. These ova were collected on scrub oak at Colonie, Albany Co., New York, on 15 April 1972. This is well within the range of true *maia* and well away from the influence of *nevadensis*. I successfully reared these larvae to maturity on *Salix* (willow) from the Mojave riverbed near Victorville, San Bernardino Co., Calif. I tentatively identified the willow as sandbar willow, (*Salix hindsiana* Benth). The larva readily accepted this as an alternate foodplant after feeding on a California scrub oak (*Quercus chrysolepis* Liebm.) for two instars. I had an 80% successful pupation rate and emergence began in September 1972. So apparently *maia* does accept *Salix*, at least in captivity. I leave it to the Midwest collectors to solve the *maia-nevadensis* confusion in that area.

Hemileuca electra (W. G. Wright)

Ferguson mentions that he saw too few specimens of *H. electra clio* (Barnes and McDunnough) to give a definite statement on the validity of its status as a subspecies. Southern California collectors who have had experience with this species feel that *clio* extends its range into California on the Mojave Desert plateau to the desert foothills of the

San Bernardino, San Gabriel, and Sierra Nevada mountains. Larvae and ova masses are found on *Eriogonum fasciculatum* var. *poliofolium* (Benth) within this range and the adults match closely to *clio*. *H. electra electra* on the other hand occurs on the coastal slopes of these ranges, to the ocean, feeding on nominate *E. fasciculatum* (Benth). In the 1972 season, I reared the larvae of these two subspecies side by side to find out if there were larval differences that might strengthen the validity of these two forms as subspecies.

I took 20 first instar larvae of *e. clio* on 27 February 1972 at Rock Corral, 20 miles east of Lucerne Valley, San Bernardino Co., California. I also took 30, third to fifth instar, larvae of *e. electra* on 25 March 1972 from one mile west of Lake Mathews Dam, Riverside Co., California. The following differences were observed in the physical appearances of the fifth instar larvae of each group.

a. The spines on the lateral rows of *e. electra* were as described by Ferguson, "black with yellowish tips." This trait was consistent on all the Lake Mathews larvae. All *e. clio* larvae from Rock Corral had the lateral rows of spines colored solid black, without any yellow tips.

b. When compared, the *e. clio* larvae had much less white mottling or spotting on the body than did the *e. electra*, a characteristic that gave the *e. clio* larvae a much darker over-all appearance.

c. The whitish line that flows lengthwise along the body of the larvae just above the spiracles is much more pronounced or "striking" in *e. clio* than in *e. electra*, and much straighter.

These larvae all pupated in late April and early May 1972 and began emerging in July 1972. I have taken *H. e. clio* larvae or ova from the Rock Corral spot, from the foothills south of Apple Valley, San Bernardino Co., and from one mile north of Red Rock Canyon, off Hwy 14, Kern Co., all in California.

After two years of unsuccessful attempts at rearing *e. clio* on its native foodplant, a very dry form of *E. fasciculatum*, in 1972 I transferred them to the nominate *E. fasciculatum* that *e. electra* feeds on. It is much longer-leafed and lusher, and I was successful in bringing the majority of the larvae through on this plant.

Hemileuca burnsi (J. H. Watson)

I have found larvae of this species commonly on *Tetradymia axillaris* (A. Nels) cotton thorn, and *Prunus fasciculata* (Gray) desert almond, in the foothills south of the Victorville-Apple Valley area of San Bernardino Co., California. These larvae are best collected in late January and early February when the foodplants are just beginning their growth and the black larval masses are easily spotted. Some

collectors are successful in finding the oval rings in the winter, but I am not one of them. Where I have searched long and hard for ova, I have found many larval masses in the spring. I have had pupae from *H. burnsi* continue to emerge for two years after pupation. These larvae and those of the other *Hemileuca* that I have had experience with are very susceptible to parasites, and therefore are best taken in the earlier instars.

I add some general comments on my experiences with the rearing of *Hemileuca.* I have found that all the attitudes about them being hard to rear are true, and only after many unsuccessful attempts have I been able to bring a good series of adults out. I have found that the larvae require absolute cleanliness and constant, fresh food. They also cannot be crowded, and I limit them to 10 larvae per container in the fifth instar. I use clear plastic quart jars that can be purchased inexpensively in any store, and drill holes in the bottom for the stems of the food-plant to be put into water. The larvae are very susceptible to disease, and several can be lost in a short time. I have reared all my larvae with no sunlight, but with abundant artificial light. When the larvae begin to roam about the bottom of the rearing container and take on a discolored appearance, I transfer them to another container for pupation. I use common "cat litter" as a pupating medium for all larvae, with tissues shredded on the top. This material seems to make very good pupal cells and is very mold resistant. The larvae usually burrow under the surface after a couple of days of roaming and pupate using the tissues as the top of the cell. The larvae frequently tend to pupate in groups, or near branches or twigs in the container. I wait two weeks after the last larva has burrowed before I gather the pupae; this allows enough time for all to pupate. Strangely, almost all the species in captivity begin emerging in July, although their natural flying period is September to November. This emergence continues off and on through October.

In summary, my rearing experiences with several *Hemileuca* species have supplied the following data to help answer questions in shadowy areas: *H. maia* will readily accept *Salix* as an alternate foodplant, at least in captivity; *H. e. electra* and *H. e. clio* have definite, consistent larval differences that support the idea of subspeciation, and the range of *H. e. clio* extends into the northern desert areas of southern California; and *H. burnsi* will accept *Prunus* in the wild or in the laboratory. I hope these data will aid in clarification of the status of the species and subspecies of this beautiful group and encourage others to rear the larvae.

With Ferguson's outstanding book for guidance, much more can be learned about *Hemileuca* through rearing and experimentation.

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MELANISM IN MOTHS OF CENTRAL MASSACHUSETTS (NOCTUIDAE, GEOMETRIDAE)

THEODORE D. SARGENT
Department of Zoology, University of Massachusetts,
Amherst, Massachusetts 01002

The relative dearth of information on the incidence of melanism in North American moths has been recently noted (Kettlewell, 1973). Since the reviews of Owen (1961, 1962) called attention to increasing melanism in various bark-like noctuids and geometers, little else on North American species has been published. Owen & Adams (1963) analysed the occurence of melanism in *Catocala ilia* (Noctuidae) in Michigan, and Klots (1964, 1966, 1968a, b) briefly noted increases in the frequencies of the melanic forms of *Charadra deridens* and *Panthea furcilla* (Noctuidae) in Connecticut. More recently, Sargent (1971) provided data on melanism in *Phigalia titea* (Geometridae) in central Massachusetts. The present data, acquired in the course of collecting moths for other studies in central Massachusetts from 1968–1973, are presented in hopes of stimulating others to acquire and publish similar data. Accumulated records, from different areas and at different times, may permit some meaningful geographic and historical comparisons, and so may contribute eventually to a thorough analysis of melanism in North America. Certainly every effort should be made to take advantage of our opportunity to study this phenomenon as it unfolds, for this opportunity may now be lost elsewhere in the world (Kettlewell, 1973).