CONTENTS

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MARYLAND ENTOMOLOGICAL SOCIETY

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The purpose of the Maryland Entomological Society, which was formed in November, 1971, is to promote the science of entomology in all its branches, to provide a meeting place for professional and amatuer entomologists residing in Maryland, the District of Columbia, Virginia, Pennsylvania and Delaware, to issue a periodical and other publications dealing with entomology, and to facilitate the exchange of ideas and information through its meetings and publications.

Membership in the Society is open to all persons interested in the study of entomology. All members receive the Maryland Entomologist and monthly newsletters and/or announcements of meetings. Institutions may subscribe to the Maryland Entomologist but may not become members. Prospective members should send to the Treasurer full dues for the current year, together with their full name, address, telephone number, and special entomological interests.

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Back issues of the Maryland Entomological Society Newsletter (Vols. 1,2,& 3 - 8 nos. each) and the Maryland Entomologist are available, to members, from the Treasurer. The M.E.S. Newsletters are .25¢ per no. and the Maryland Entomologist is $1.00 per copy.

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The Maryland Entomological Society is a non-profit, scientific organization. Meetings are held on the third Friday of every month (from October to May) at 8:00 p.m., in room 403 of the Biological Sciences Building, University of Maryland Baltimore County.

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Cover illustration: The logo of the Maryland Entomological Society features the Maryland Shield and a specimen of Euphydryas phaeton (Drury), the Baltimore Checkerspot, which became the official insect for the state of Maryland through the efforts of many of the members of this Society.

OBSERVATIONS ON OVERCOLLECTING AS A CAUSE IN THE DECLINE OF LEPIDOPTERA

Clifford D. Ferris

The controversy about overcollecting has raged for many years between conservationists and entomological collectors. While it is true that certain butterflies have apparently disappeared from the United States and Great Britain, the reason is not overcollecting. During the course of my research, I could find no documentation to support overcollecting as a cause for the disappearance of butterfly species. To the contrary, several articles denied overcollecting as a factor (Anon., 1975; Orsak, 1978).

During the past forty years, four butterflies have disappeared in the United States; all from California. These are the Xerces blue, Glaucopsyche xerces (Boisduval), Atossa fritillary, Speyeria adiaste atossa (W.H. Edwards), Pheres blue, Plebejus icarioides pheres (Boisduval), and Strohbeen's parnassian, Parnassius clodius strohbeeni Sternitzky. In the 1880's, Cercyonis sthenele sthenele (Boisduval) disappeared from the San Francisco Bay area, as have pheres and xerces in more recent times. The types of sthenele were destroyed in the San Francisco fire.

The demise of the Xerces blue is well documented. Man was certainly responsible, but overcollecting was not the cause. This butterfly was ecologically restricted to a sand dune environment in the San Francisco Bay area. The larval hosts were various Leguminosae; Lupinus, Lotus, Astragalus. Land development and concomitant housing construction destroyed the habitat of this insect. Once the host plant biomass dropped below the critical level necessary to support xerces, the butterfly disappeared. The last specimens were collected on 23 March, 1943. Sand dune association butterflies appear to be especially vulnerable to man's encroachments.

The disappearances of S. adiaste atossa and P. clodius strohbeeni appear to be related to somewhat more complex factors. Both species occurred in rather arid coastal mountain ranges of southern California. The larval hosts are respectively Viola (violets) and Dicentra (Dutchman's breeches family). These plants require a fair amount of moisture on a year-round basis. The natural general drying up of certain portions of western North America during the past several decades, coupled with increased demands upon watersheds for urban and agricultural uses, has produced an increase in the desertification in portions of southern California. As a consequence, in some areas the larval hosts for the two species mentioned above have diminished significantly. This situation has certainly accelerated the demise of these butterflies. Orsak (1974) has speculated upon the disappearance of atossa.

Two other butterfly species have disappeared from their type localities, but again not from overcollecting. The cause is the Army Corps of Engineers and related organizations. In both cases, the type localities have been flooded by water backed up behind dams. The species are Lycaeides argyrognomon atrapraetextus (Field) and Parnassius clodius shepardi Eisner. The former is from the Priest River area of Idaho, and the latter from Wawawai on the Snake River in eastern Washington. The type locality canyon at Wawawai is now under 200 feet of water.

There are other butterflies of questionable status. One is Eumaeus atala florida (Röber), the Florida atala. This butterfly is the basis for the name of the journal published by the Xerces Society, an organization dedicated to insect conservation. While some authorities insist that E. atala is a native insect, now possibly extinct, other authorities believe that this butterfly is periodically introduced into Florida from the Bahamas (by storms). It then survives for a few years. In either case, the reason for its failure to survive appears related to lack of suitable habitat, again as a consequence of real estate development, rather than overcollecting. This butterfly is restricted to Zamia integrifolia as a larval host, and has been forced to compete with several more aggressive Lepidopterous insects for this foodplant. This situation has possibly caused its demise, as speculated by Klots (1951).

In California, six lycaenids have been placed on the Endangered Species List. They are: Lycaeides argyrognomon lotis (Lintner), Apodemia mormo langei J.A. Comstock, Incisalia mossii bayensis R. Brown, Plebejus icarioides missionensis Hovanitz, Euphilotes enoptes smithi (Mattoni), Euphilotes battoides allyni (Shields). The reason for this action relates again to loss of suitable habitat, not to overcollecting. Other species in the United States have been proposed for endangered species

status, and again, the reason is loss of habitat.

Around the world, various butterfly species are being reduced in numbers, and the cause is not overcollecting, but other encroachments by man. Some critical regions are Costa Rica, where the jungle is being destroyed at an alarming rate to develop agricultural land; Africa, where cattle overgrazing is intensifying desertification; areas of Taiwan associated with land development; destruction of jungles in South America to develop agricultural land.

It is well known that many butterfly species undergo periodic population explosions, while during normal years they may be rather scarce. This is true especially of certain Hesperiidae. In one day during the early summer of 1968, I took 100 specimens of Euphyes bimacula (Grote & Robinson) near Passadumkeag, Penobscot Co., Maine. This butterfly was so numerous in the area that my collecting made no observable dent in the population. During normal years, perhaps only one or two specimens are collected in the locality (L.P. Grey, in litt.). The particular slough where I collected has now been turned into a land fill, and the habitat has been basically destroyed.

Many factors control such periodic population explosions followed by apparent low-density periods. Some are: climatic conditions, vitality of larval hosts, parasite population densities, competition with other species. Overcollecting cannot be blaimed for the low-density periods, since very few, if any, specimens are taken.

While it is conceivable that a team of determined collectors might erradicate a given colony of butterflies from a particular locality, several factors must be examined. First the butterfly colony would have to be sufficiently isolated geographically that no chance exists for colonization (reintroduction of the species) from another nearby area. Second, the habitat must be sufficiently compact such that the potential exists for collection of all butterflies of the target species. Third, collection must be conducted during the entire flight period for every day that the butterflies are on the wing. Otherwise, mating will occur with subsequent unobserved oviposition. Some butterflies mate very early in the morning, and the females of some species are impregnated shortly after eclosion, even before their wings are fully expanded. Even with such a diligent program of collecting, it is unlikely that oviposition would be prevented. It would probably take several years of such intensive efforts to eliminate a colony. The reproductive potential of insects is considerably greater than that of mammals and other higher organisms.

I can cite two species within my experience that have been collected very heavily with no apparent diminution in population. The first is Boloria napaea halli Klots in the vicinity of Palmer Lake, Bridger Wilderness Area, Sublette Co., Wyoming. This insect was rediscovered after 30 years by a group of four collectors (the author included) in 1969. Lack of collection in prior years related to the isolated nature of the habitat. The butterfly was moderately collected in 1969. It was heavily collected by four collectors in 1970 (several hundred specimens); moderately collected in 1971, and heavily collected again in 1972 by three collectors. In 1973, another collector reported the species as abundant. Eventhough this insect has a short flight span, collecting seems to have had little impact.

The second species is Hypodryas gillettii (Barnes) (formerly Euphydryas). This is considered as a very desirable species among collectors, and it usually occurs in rather isolated colonies. It appears to be a rather sedentary species. The Granite Creek colony in Teton Co. Wyoming occupies a rather limited area, perhaps one-half square mile, in the bottom of a fairly deep canyon. The butterflies do not stray very far from the larval host, Lonicera involucrata, and nectar avidly at flowers, especially wild geranium, thus making them easy targets. This colony was very heavily collected by three collectors in 1969. During the ensuing years, it has been visited regularly and collected heavily by a variety of collectors. I visited the colony in July, 1979 and the butterflies were more numerous than ever, despite near drought conditions following an unusually cold winter (the larvae hibernate). In some cases, it would appear that collecting enhances rather than reduces population density in subsequent years. At least one can make such an inference based upon limited data. One explanation is that competition among larvae for larval hosts is reduced, and hence more larvae survive.

While one could counter that the two examples cited above represent very limited data, on the other hand, they represent very "desirable" species from a collector's point of view. Additionally, they occupy restricted habitats, and in that sense, are vulnerable to collecting pressure. Despite these factors, relatively intensive collecting has not reduced their numbers.

Generally speaking, butterfly species that have reached endangered or threatened status, have not done so as a consequence of overcollecting. The basis for such action has related to destruction of habitat to a level that is or may be marginal to the survival of the species. This is the case, for example, with Euphilotes battoides allyni. This butterfly is now restricted to a very limited habitat on private land and a portion of the Los Angeles airport. It is only through the efforts of various conservation groups and the Standard Oil Company of California, which owns the private land, that this butterfly continues to survive (Pyle, 1979). In no way has overcollecting contributed to the precarious status of this insect. The butterfly is, in fact, quite rare in collections, public or private. It survives in what might be termed a microhabitat, tied to a particular Erigonum host. Development of the general region in which the species flies has reduced the biomass of the host plant to a critical level with regard to supporting allyni.

For several decades, eastern collectors have bemoaned the reduction in the numbers of native silkmoths in their region. The larvae of many of these feed upon shrubs and deciduous trees. In the 1940's, most of the large silkmoths were relatively common in the Middle Atlantic states. As a child, I collected in eastern Pennsylvania and southern New Jersey. Adults were easily taken at light, and there was little difficulty in locating cocoons in the fall after the leaves had fallen. After WW II, considerable amounts of agricultural land were cleared for housing developments and shopping centers. Habitat disappeared by the square mile, and consequently the moths. Shopping centers, industrial parks, and the inexorable sprawl of suburbia have taken their toll. In the early 1940's, many silkmoths could be taken in the heart of Philadelphia where I lived. Cocoons were easily found in many of the city parks.

The mercury vapor lights, now so popular for street, highway, and parking lot illumination have been implicated by some collectors as contributing to the reduction in numbers of moths in general (Hessel, 1976). The high ultraviolet output from these lights does attract many insects. The implication is that moths become dazed by the lights and courtship is interrupted, thus reducing subsequent populations.

One cannot deny that man and his devices are contributing to the decrease in the numbers of Lepidopterous insects. Direct destruction of habitat, use of agricultural pesticides, smog (fallout of phytotoxins) and other man-related environmental factors are all responsible. On the other hand, overcollecting does not appear to be a factor, or if so, one of negligible significance when compared to man's other encroachments upon Nature.

One must also recognize that some species are not genetically equipped to survive natural changes in the environment. Natural extinction is a natural process.

There is a school of thought among some museum curators and private collectors that is counter to the conservation approach. In the long run, it may be the most rational when we consider what is currently happening to the world's flora and fauna. This group has proposed that as many specimens as possible should be collected and placed in museum or research collections. In this manner, study material will be available for future generations. The question asked is simply, how many great auks, dodos, or passenger pigeons are available for study? Or for that matter, how many Glaucopsyche xerces?

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OBSERVATIONS ON THE INSECTIVOROUS PREDATORY BEHAVIOR OF A CAPTIVE NORTHERN PARULA WARBLER

Austin P. Platt and S. J. Harrison

During the northern migration of spring warblers, on 13 May, 1978, S.J.H. recovered an injured adult male northern Parula Warbler (Parula americana), which had just flown into the glass window on the front of his house on St. Agnes Lane, Catonsville, Md. The injured bird was brought to A.P.P. at U.M.B.C., where it was placed in a small Ward's insect breeding cage (40.5 x 23.5 x 29.5 cm). Upper and lower stick perches were inserted into the cage along with a water dish. The bird soon partially recovered from being stunned and, except for being unable to fly (because it had a weakened and partly separated right wing), it exhibited normal reactions. We thought that the warbler would soon die, but it settled down, became used to the cage, and soon displayed considerable route tracing activity. This note will report the interesting insectivorous feeding behavior and habits of this bird, which occurred between Saturday, 13 May and Friday evening 19 May, 1978, when the bird was found dead in its cage.

At noon on 13 May, the injured warbler was taken to A.P.P.'s house on Drury Lane in the Ten Hills section of Baltimore, where it was photographed out-of-doors. When placed on the limb of an apple tree in the backyard, the warbler hopped nimbly from branch to branch, using its keen vision to find aphids and other tiny insects clinging to the twigs. During this "release" session we learned that the bird was unable to fly. That afternoon we covered the top of the bird's cage with a bath towel and the Parula Warbler remained quietly in its cage in the basement of A.P.P.'s home. Late in the afternoon family members collected about one dozen house spiders from the basement and screen porch areas of the house. These were released into the bird's cage. The warbler immediately hopped over, caught each spider and ate it, as soon as it crawled out of the jar in which the spiders had been collected. Obviously the warbler was very hungry, and the crawling arachnids were an acceptable food item. We were pleased that the wild bird would eat in captivity. Soon afterwards we observed it drinking from the water dish, as well.

A search of our yard for other "insectivorous" food items yielded sow bugs (Crustacea: Oniscus spp. and Porcellio spp.), earthworms, termites, and wood boring larvae of several species of beetles. The warbler readily consumed all of the prey items which were of small size (up to about 1.5 cm long), but it did not even attack those individuals of larger size (greater than 1.5 cm). Again, the birds' interest in the food items was aroused by the prey's crawling activities. The warbler continued searching for prey among the litter (which had been introduced into the cage along with the prey) long after the acceptable food items themselves had been consumed.

Each time the bird caught either a sowbug or a beetle grub, the invertebrate was held cross-wise in the birds' beak, and was "crunched" back and forth, from side to side, as the bill was rapidly opened and closed for 10-20 sec. at a time, before the prey was swallowed. This behavior had two apparent effects: 1) the organism was killed and softened, and 2) the gut contents of the invertebrates were extruded prior to swallowing. Later, similar manipulative behavior was observed when the warbler ate butterfly larvae.

On 14 May, vials of fruit flies (Drosophila spp.) obtained from U.M.B.C., were introduced into the fine meshed breeding cage and the flies were allowed to escape from the vials. The warbler immediately and deftly responded to the flies and "snapped" them up nearly as rapidly as they swarmed out of the vials. The bird's appetite was insatiable, and it literally, ate as many fruit flies as we could offer it.

The warbler moved excitedly throughout the cage, using its keen vision and excellent balance to catch the flies in rapid succession, while they were both crawling and flying. Whenever the bird lunged for a fly and missed it, an audible "click" could be heard, as its mandibles snapped together. The rapidity and dexterity with which the bird persued the flies was astonishing. At first the warbler attempted to peck at the crawling flies through the glass sides of the vials (while the flies still were on the inside), but it rapidly learned to pick the flies off of the top lips of the vials, so quickly that many of them never had time to take flight. Afterwards, the warbler was offered blow flies (Phormia regina), a larger dipteran species. These also were quickly caught and eaten by the bird.

By this time the warbler had begun to associate us with being fed, and it soon lost all of its fear of people, taming down remarkably, to such an extent that it willingly perched on our fingers and shoulders. The bird continued to feed voraciously for several days, and it produced normal droppings. Fruit flies obviously represented the preferred food item we offered to the captive bird. Our warbler's right wing became somewhat stronger, and the bird appeared to be well on its way to a complete recovery from its accident.

On Friday morning, 19 May, the bird was offered both a third and a fourth instar larva of Limenitis archippus Cramer. These larvae taken from our laboratory cultures of these butterflies had been reared on weeping willow plants (Salix babylonica Linnaeus). Both larvae remained in the bird's cage for several hours without being touched. The warbler refused to attack the slowly crawling larvae, and quite obviously did not recognize them as food items.

That afternoon, however, the warbler was released into our large netted butterfly cages located in the basement of the Biological Sciences building at U.M.B.C. Here it rapidly consumed as many Drosophila as it could catch, but it did not attack the adult admiral butterflies (L. archippus and L. arthemis Drury) also confined in those cages. This is not at all surprising, since the adult insects were nearly as large as the Parula Warbler itself.

Soon, however, the warbler was hopping and flying short distances about the room, from willow plant to willow plant, searching for aphids and other plant insects. Then the bird encountered third instar L. archippus larvae on the plants. These larvae usually had assumed their protective (non-moving) "resting" attitude (posterior abdominal segments raised upward, with their head and thorax curled around the twigs). These larvae were picked off the plant and were eaten, tentatively at first, but later more assuredly and with more rapidity. In a matter of minutes the bird had learned to recognize the larvae and had eaten approximately 14 of them.

At this point, about 5:00 P.M. Friday afternoon, the warbler, still very lively, was returned to its cage, and was left alone in A.P.P.'s second floor laboratory during the dinner hour. Upon returning Friday evening for the May M.E.S. meeting at U.M.B.C., the bird was found dead beneath its perch within the cage, which had been partly covered with a linen towel, as was customary at night. The cause of the bird's death is not known. Possible causes contributing to its demise are the following: 1) injuries suffered during the original accident; 2) possible toxicity of the Limenitis archippus larvae it consumed that afternoon; and 3) a slight gas leak in the laboratory.

Items eaten by the Parula Warbler during its period of captivity included house spiders, fruit flies, blow flies, termites, aphids, lepidoptera and beetle larvae, and earthworms. Many of these probably are not taken frequently by wild Parula Warblers, which often tend to forage in and around tree trunks beneath the forest canopy much of the time while migrating. Size, rather than invertebrate species, appeared to be the criterion the warbler used most often in selecting its prey. Otherwise, it seemed to be a very opportunistic predator.

We hope these observations will be of interest to members of the Society. They illustrate how the predatory behavior of an insectivorous bird can quickly be altered through learning and experience. Our observations also are indicative of the tremendous selective pressures which all insectivores must exert upon natural populations of insects in general.

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SUMMARY OF THE 1978 FIELD TRIP OF THE MARYLAND ENTOMOLOGICAL SOCIETY

Philip J. Kean

The Maryland Entomological Society held its annual field trip for the 1978 season on Saturday, July 22, 1978. The trip was planned to coincide with the annual Xerces Society Butterfly Count, and since Mr. John Fales, a member of both societies, already had a locale plotted where he had conducted these counts in past years, it was decided by the membership that our annual trip would be made to his plotted area to assist both Mr. Fales and the Xerces Society in their recording efforts. The chosen collecting area was generally in Calvert Co. in southern Maryland's western shore region. However, since the Xerces Society collect-

ing plot rules mandate a circular area 15 miles in diameter, small portions of upper St. Marys Co., eastern Prince Georges Co., and lower Anne Arundel Co. were also included in the count area. The area was centered at Mr. Fales' Plum Point residence located on the coast of the Chesapeake Bay, roughly in the middle of Calvert County's coastline.

Our day began early with M.E.S. members arriving at Mr. Fales' house before 9:00 A.M. Those who assembled at Plum Point to start the day were Ed and Joy Cohen, Mr. Robert Mitchell, Dick Smith, myself, and, of course, Mr. John Fales. We decided to divide into two parties with Dick Smith and myself comprising the first party and the others making up the second group. Dick Smith and I would take the southern portion of the 15 mile circle and the others would start in the northern portion. The western part would be collected by a third team consisting of Dr. Paul Opler and his son, Tim, who would join us at the end of the day to help compile our count data. No group was sent to the eastern part of the area as the overwhelming majority of it is taken up by the Chesapeake Bay.

The general purpose of the Xerces Society counts is much the same as the Audubon Society Bird Counts, after which it is patterned. The idea is to collect quantitative data on the occurrence, abundance, and distribution of all the species of butterflies occurring in your area so that drastic changes in these factors can be documented. Perhaps an even more important function is the compilation of many successive years' counts so that more subtle changes in these and other population factors can be documented. This type of data can be of untold value in preventing local extinctions of unique or restricted species, and can help in the battle to protect and preserve wildlife in long range regional planning. A central component in this picture is the current land use pattern in the count area and what projected or current changes in land use are expected or are getting under way.

The basic character of our particular count area used to be primarily rural-agricultural with farming of corn, soy, and tobacco on suitable lands with a large portion of eastern hardwood forest dominating the remainder of the landscape. Being in such close proximity to the Chesapeake Bay, a significant area is also occupied by beach and brackish water marsh areas, with occasional clusterings of shorefront residential communities. In past years, many of these residential areas were only occupied on a seasonal basis, but the change in present-day economic patterns, and better access to the region by major highway systems, has opened this area and, indeed, the whole Chesapeake Bay region to increasing environmental pressures by way of an ever increasing growth of residential development. As of today, this area consists of over 40% human altered land area (open farmland, meadows resulting from past farming, highways and other roads, shopping districts, and residential development), approximately 40% eastern hardwood forest, 10% open water, about 5% marshlands, and minor percentages of more specialized habitats such as beach, silt cliffs, and a couple of relict stands of cypress swamp. Current trends indicate further increases in residential development into the foreseeable future.

By the time we dispersed to observe and collect, it was getting on toward 9:30 A.M. Although we were blessed with clear skies all day long, the heat was oppressive. The morning haze was quickly burned off by temperatures reaching a high of 37°C. for the day. Another factor that worked on us was the very high humidity. We were treated to a few westerly breezes of 8-10 km/hr. along the coast, but once away from the shoreline we had no winds at all.

In compiling the count data, we used both collected specimens and observed species that we saw at the various collecting sites as well as any species we could identify on the wing while driving between sites. While this may introduce a slight bias for the large and more readily identifiable species, this is offset somewhat by the fact that many of the meadow and roadside species would be in lower numbers in the more wooded areas where much of the on-foot collecting was done.

Dick Smith and I headed south from Plum Point to our first collecting stop at Parker's Creek. We walked for approximately one mile through undisturbed woods until we reached the creek. This is one of Calvert County's most scenic watercourses with many large trees shading and actually growing in the creek. At first impressions, it reminded me of the great southern mangrove swamps. Of course there are no mangroves growing this far north, but it certainly did have that appearance. As this spot was so heavily wooded, we did not see butterflies in any great numbers here. However, one noteworthy sighting that we did make at this spot was of a fresh specimen of Battus philenor (Linnaeus), a rather uncommon species in this region of the state.

Traveling on, our next stop was a small remnant cypress swamp just over the Calvert Co. border in upper St. Marys Co. Here we were hoping to encounter the Carolina satyr, Euptychia hermes sosybius (Fabricius). Although we knew it was rather early for this species, as the earliest Maryland records for the second brood are the fourth of August (Wm. A. Andersen, pers. comm.), we still stopped here to collect. Although several satyrs were sighted, all those that we collected turned out to be the more common Little Wood satyr, Euptychia cymela (Cramer).

From the cypress swamp, Dick and I headed toward the Patuxent River bridge at Benedict to collect. While we made it to the other side to collect in the large dogbane field along the roadside, that was as far as we got because Dick's car suddenly developed an electrical system failure. At this point, we decided that "discretion was the better part of valor," and that we should call in the cavalry. Mrs. Fales arrived about a half hour later and took us back to Plum Point where we freshened up and awaited the return of the other groups to tabulate the day's data. When the others arrived and the smoke had cleared, we had collected or observed a total of 42 species comprising 1075 individuals for the day. Mr. Fales was given the raw data to compile for submission to the Xerces Society, and when their statistics of all the counts were published later we learned that our count was the third highest in the country for a total number of species. We placed just behind Paul Opler's northern Virginia count of 46 species and Raymond Stanford's bell-ringer Colorado count of 89 total species. While the entire results of the data tabulation won't be reproduced here, a brief summary of the species encountered follows:

Hesperiidae:

*Epargyreus clarus (Cram.)
Thorybes bathyllus (A.& S.)
Pholisora catullus (Fabr.)
Erynnis horatius (Scud.& Bur.)
Ancyloxypha numitor (Fabr.)
Poanes viator (Edw.)
Atalopedes campestris (Bdv.)
Wallengrenia egeremet (Scud.)

Papilionidae:

+Battus philenor (L.)
Papilio polyxenes asterius Stoll
Papilio glaucus L.
Papilio troilus L.
Graphium marcellus (Cram.)

Pieridae:

+Pieris protodice Bdv.& LeC.
*Pieris rapae (L.)
*Colias eurytheme Bdv.
*Colias philodice Gdt.
Eurema lisa Bdv.& LeC.

Lycaenidae:

+Mitoura gryneus (Hbn.)
Strymon melinus humuli (Harris)
Lycaena phlaeas americana Harris
Celastrina argiolus pseudargiolus (Bdv.& LeC.)
*Everes comyntas (Gdt.)

Libytheidae:

+Libytheana bachmanii (Kirt.)

Nymphalidae:

Asterocampa celtis (Bdv.& LeC.)
Asterocampa clyton (Bdv.& LeC.)
Limenitis astyanax (Fabr.)
Limenitis archippus (Cram.)
Vanessa atalanta rubria (Fruhs.)
Cynthia virginiensis (Dru.)
*Junonia coenia (Hbn.)
Nymphalis antiopa (L.)
Polygonia interrogationis (Fabr.)
Polygonia comma (Harris)
Phyciodes tharos (Dru.)
Boloria toddi ammiralis (Hem.)
Speyeria cybele (Fabr.)
+Euptoieta claudia (Cram.)

Danaidae:

Danaus plexippus (L.)

Satyridae:

Lethe appalachia Cher.
Euptychia cymela (Cram.)
Cercyonis pegala alope (Fabr.)

* Denotes common species - 50 or more seen or collected
+ Denotes rare or uncommon species

Since the intent of this trip was to collect and observe butterflies for the Xerces count, very little observation of other insect orders was done due to the constraints of time. However, I did notice a rather sizable population of the beautiful dogbane leaf beetle, Chrysochus auratus (Fabricius)- Chrysomelidae, in the dogbane field at Benedict. Also noted at Plum Point were several specimens of the pretty green June beetle, Cotinis nitida (Linne)- Scarabaeidae, one of which was captured by the author. This species is a noted feeder on soft fruits and they were attracted to the ripening peaches on Mr. Fales' tree.

Had time permitted, it would have been nice to collect along the beach and silt cliff habitats. Among the specialized inhabitants of

this ecosystem are three rare tiger beetles, all known from this very region in Maryland. They are Cicindela hirticollis Say, Cicindela puritana (Horn), and Cicindela dorsalis Say - Cicindelidae. The latter two may be endangered species. However, time would not permit our search for them on this trip. Even so, and despite our trials and tribulations, we still had a full and enjoyable day.

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THE GREAT PEACOCK MOTH: FROM EGG TO ADULT IN JUST 1460 DAYS!

Robert S. Bryant

Back in the late 1950's when I first read J. Henri Fabre's thoroughly entertaining account of his experiments with Saturnia pyri Denis & Schiffermuller, I did not realize that I would one day have the opportunity to work with this fascinating European moth. Since pyri was described about two centuries ago and has been reared by breeders and hobbyists repeatedly in Europe and America, it's remarkable that anything remained to be discovered about its life history.

In 1975 I received three dozen pyri ova from a fellow breeder in Paris, France in exchange for the ova of a U.S. species. During the summer of 1975 I managed to rear 20 to the pupa stage on cut branches of Seckel pear. Since the name pyri is derived from Pyrus, the pear genus, and since pear is listed as a preferred food plant by many breeders and authors (Villiard, 1969), I assumed it would be the best plant to use. The cocoons were small but as I had nothing to compare them with, I was satisfied with the results. The cocoons were left to over-winter on our screened porch and with the resumption of milder weather in May 1976 all eclosed, small but vigorous. Several matings were obtained producing an abundance of ova.

In an effort to determine the suitability of some of the other food plants of pyri, three starter brooders (Villiard, 1969) were set up. One contained apple, the second contained Kwanzan cherry and the third, pear, as a control. Fifty larvae were placed on each plant. It became obvious by the end of the first week that apple was the superior food plant. Not only did the larvae grow bigger and faster but apple kept fresh longer in water. When the apple feeders were well along in the fourth instar, the others were only in the second and early third instars. By this time our typically hot Baltimore weather was causing the cherry leaves to wilt badly in two or three days and the pear became sere in 36 hours or less. As the mortality rate was rising in the pear and cherry groups, all larvae were switched to apple in late June in an effort to save as many as possible. Mortality among those larvae originally started on apple was relatively low and as the first cocoons were formed it was noticed that they were nearly twice as large as the ones reared in 1975 on pear. I had expected the mortality rate to be high as a result of inbreeding but I had not expected to produce larvae and adults that were larger than their parents. In all, 35 cocoons were produced in 1976. Very few of the pear and cherry larvae survived and those that did were smaller than those that ate apple throughout.

The pupae spent the winter on the porch and began hatching in late April 1977. When the flight season ended, there were twelve unhatched cocoons that still felt heavy and viable. Since I had had experience with doubly overwintering pupae in the past, I figured they might hatch the following year and they were left to their own devices while I became busy with other rearing problems. Several matings were obtained from the moths that did hatch and, still elated over the previous year's success with apple, two starter brooders were set up each containing apple branches and 50 larvae. The larvae grew well, mortality was again fairly low but due to a limited supply of apple they were not able to attain the large size of the 1976 brood. Fifty pupae were obtained which were left to overwinter on the porch.

When emergence time rolled around in April 1978, only four of the 1976 brood hatched and about half of the 1977 brood but those remaining still seemed to be alive. Matings were again obtained and since apple was becoming harder for me to get I opted for cherry. In an effort to offset losses due to diminishing food plant quality, 200 larvae were started on Kwanzan cherry branches. Fresh food was provided more frequently but they grew slowly and eventually barely attained the size of the original 1975 specimens. Eighty-five pupae resulted.

During April and May 1979, individuals of the 1976, 1977, and 1978 broods hatched simultaneously enabling me to interbreed the adults of all three broods. It seemed more advantageous to breed a 1978 male to his grandmother's sister, than to his own sister, in terms of keeping the blood line mixed. All matings and reciprocal crosses produced viable ova but due to devastating rains and resultant humidity during the summer of 1979, nearly all larvae were lost. In order to remain healthy, pyri larvae need dry conditions (Villiard, 1969).

On 4 May, 1980, just two months short of four years, the last two of the 1976 cocoons hatched. Both were females and showed not the slightest sign of deformity or weakness from their prolonged stay in the cocoon. As I again had cocoons from the 1977 and 1978 broods hatching at the same time I was able to get one 1976 female mated to her nephew and the other to her grand-nephew. Only time and weather conditions will tell whether or not these unions will produce results. Through summer's heat and humidity and winter's cold, drying winds the cocoons were left unprotected. The only times they got sprinkled were when an infrequent storm with a strong wind from the south managed to drive the rain in under the eaves of the house.

During the five years that I have had pyri emerging in late April and May, two other interesting phenomena have occurred. Virgin female pyri are able to attract wild Antheraea polyphemus Cramer males (Bryant, 1980). On several occasions I have been able to capture the polyphemus males and upon introducing them into the breeding cages they have attempted, unsuccessfully, to mate with the pyri females. Unfortunately, the first week of May is too early for my own polyphemus cocoons to hatch so I have been unable to ascertain whether or not pyri males would be attracted to, or be able to mate with, virgin polyphemus females.

Aside from the usual benefits of rearing, such as being able to witness first hand the immature stages of a variety of lepidoptera and being able to add countless perfect specimens to ones collection, there infrequently occurs the opportunity to obtain one of nature's curiosities. Such was the case on 6 May, 1979 when one of the 1977 brood of pyri emerged with one male and one female antenna. Unfortunately, male and female pyri are almost exactly alike in regard to color, pattern, and the shape of their wings, so without microscopic examination of the genitalia I can't be certain if the specimen is a bilateral gynandromorph. It seems to possess only one clasper on the side with the male antenna and it neither attracted nor was attracted by either sex during the normal mating time.

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RECORDS OF PAPILIO CRESPHONTES IN MARYLAND, WITH NOTES ON ITS NORTHERN DISTRIBUTION

Austin P. Platt

Although common in the southern portions of its geographic distribution, northern records of the giant swallowtail (Papilio cresphontes Cramer) have always intrigued collectors, not only because this species is our largest endemic butterfly (Ehrlich & Ehrlich, 1961), but also because its northern range is known to extend and contract periodically. The species generally is considered rare in Maryland, although stray specimens reportedly occur as far north as southern Ontario (Holland, 1905; Howe, 1975). Klots (1951) lists its northern geographical limits as including Massachusetts, New York, Ohio, Michigan, and Minnesota. Clark and Clark (1951) report that cresphontes ranges throughout Virginia, being common in the southern portions of the state and being "of irregular or casual occurrence" elsewhere in Virginia.

A northeastern subspecies, P. cresphontes pennsylvanicus has been described by Chermock & Chermock (1945), but this form (the type locality of which is State College, PA) is not well-differentiated from typical cresphontes, according to Klots (loc. cit.). Based on the original description, pennsylvanicus differs from typical cresphontes dorsally, in that the submarginal bands of yellow spots running from the forewing apices to the inner wing margins are "more rectangular" and more "regular" in size. Ventrally, the yellow spots are "larger and more elongate" in pennsylvanicus. This race apparently is of at least normal size for the species, and its foodplant is prickly-ash (Zanthoxylum: Rutaceae).

Wing pattern differences in Lepidoptera, such as those described above, often have a multifactorial genetic basis. Thus, they may exhibit considerable phenotypic variability between individuals. I think it wise, therefore, to consider that pennsylvanicus may represent a form, but its validity as a true subspecies (ie: a genetically distinct race) is open to question. Most Maryland specimens represent the typical form (ie: P. cresphontes cresphontes), there having been only a single specimen of pennsylvanicus reported by Fales (1974).

The giant swallowtail evidently is of limited occurrence in Maryland, most records coming from the vicinity of Washington, DC and the Potomac River Valley, although Fales (loc. cit.) reports that it occurs in three of the state's five major regions, namely the "ridge and valley," "piedmont," and "western shore" areas. It is absent only from the "montane" and "eastern shore" areas.

Since I have collected mainly in northern regions of the U.S., I have encountered P. cresphontes on only three occasions. The first of these was back in early September, 1960 when I observed a worn male hovering over blossoms and shrubs in the yard of my parents home in Glencoe (Cook Co.), Illinois. I watched the specimen from close range for several minutes but made no attempt to collect it because it was so tattered.

Not until 29 July 1975 did I encounter my second specimen of cresphontes. This one was observed flying along the western edge of the north fork of Rock Creek at the HF Bar Ranch in Saddlestring (Johnson Co.), Wyoming in the foothills of the Big Horn Mountains, at an elevation of 5,300 feet. The specimen, again a battered male, was first seen at 1230 hrs. (RMT) while I was on my way to lunch without an insect net. It was flying back and forth amid aspens, choke cherries, cone flowers, fireweed, willows, mountain cottonwoods, and alders, between five and eight feet above the ground. Such territorial "patrolling" behavior has been described in detail by Clark & Clark (loc. cit.).

Having finished my noon meal, I re-crossed the footbridge over the creek, obtained my net from the cabin, and hurried over to collect the insect, which still was patrolling the same area at 1315 hrs. This capture is especially noteworthy, since the specimen represents a Wyoming state record for the species (Stanford, 1977; see also the 1975 Season Summary in the News of the Lepidopterists' Society (1976,2). The specimen now is in the U.S.N.M. collection in Washington, DC.

My third encounter with P. cresphontes took place about 1320 hrs. on 22 May 1979 on Mar-Lu Ridge of Catoctin Mountain in Jefferson (Frederick Co.), Maryland at the Lutheran Children's Camp. This ridge overlooks the Potomac River and runs almost due north-south at an elevation of between 600-800 feet. After 20 min. of collecting along the paved road in this area, I spotted a very large, dark swallowtail flying directly toward me from the north. It approached me from a distance of about 60 feet, flying rapidly and erratically between five to eight feet above the ground. As the insect passed me, I made both forward and reverse sweeps at it with my heavy long-handled net, but the butterfly easily evaded my clumsy attempts to collect it. As the insect passed my position, I clearly observed both the wide, deep lemon yellow submarginal band of spots on the forewings, slanting diagonally inward toward the abdomen, and the yellow spots on both tails of the butterfly, which appeared to be fresh and undamaged. These characters, together with the specimen's large size, leave no doubt in my mind that this insect was a male giant swallowtail (the yellow markings are much more pale in females).

The subsequent paragraphs document 18 capture records and 24 sight records (marked with asterisks) of Papilio cresphontes made in Maryland between April, 1913 and June, 1980. These records have been arranged by counties (alphabetically and chronologically, in so far as is possible):

ALLEGANY (n = 3): 1) 1, sex unk.*, Hancock, 20-VIII-71, D. Rohrer, Jr.; 2) 1 male; and 3) 1 sex unk.*, Little Orleans, 15-V-58, W.A. Andersen, and 9-VI-78, F. Paras.

BALTIMORE (n = 4): 1) 1, sex unk.*, Baltimore City, Ten Hills, 1960 or 1961, R.S. Bryant; 2) 1, sex unk.*, near Owings Mills, Liberty Reservoir Watershed, 10-VI-79, C. Horton, C. Cearly, and S. J. Harrison; 3) 1, sex unk., Riderwood, VII-1919, S. Hayden; and 4) 1, sex unk.*, Woodlawn, Larchmont, 25-VI-65, H. Brackbill (Evening Sun newspaper article, 18-VIII-65).

FREDERICK (n = 1): 1 male*, Jefferson, Mar-Lu Ridge Lutheran Children's Camp, 22-V-79, A.P. Platt.

MONTGOMERY (n = 24): 1) 1 male, and 2) 1 female, Carderock - Cabin John, 7-VIII-48, T. Blevins (deceased); 3) - 12) approximately 10*, sexes unk., Great Falls, 2-VI-79, R. Boettcher; 13) 1 male, 14) and 15) 2 females*, Great Falls, 9-VI-79, G.O. Krizek; 16) and 17) 2, sexes unk.*, near Sycamore Landing, 19-VIII-79, J. Zeligs; 18) 1 male, Plummer Island, Potomac River, 10-VI-1913, H.S. Barbor, U.S.N.M. Coll.; 19) 1, sex unk., 20) and 21) 2 males, 22) and 23) 2 females, Seneca, 5 mi. W. at the McKee-Bishop Wildlife Nature Area, VIII-70, 14-VIII-79, 30-VIII-79, 28 and 30-V-80, respectively, W.R. Grooms and P.J. Kean; 24) 1 male, Silver Spring, Woodside, 1-VIII-43, J.H. Fales.

PRINCE GEORGES (n = 1): 1, sex unk., College Park, 3-VII-1898, collector unknown.

ST. MARYS (n = 1): 1, sex unk., Lexington Park, 22-VIII-75, J. Haliscak.

WASHINGTON (n = 8): 1) 1, sex unk.*, Dargan, 7-VIII-72, D. Rohrer, Jr.; 2) 1, sex unk.*, Great Cacapon, 9-VI-78, F. Paras; 3) 1, sex unk., Halfway, 13-V-72, D. Rohrer, Jr.; 4) and 5) 2, sexes unk.*, near Hancock, along Potomac River, 10-VI-78, F. Paras; 6) 1 male, 7) and 8) 2 females, Williamsport, 20-VIII-79, J. Levasseur.

Actual Maryland specimens of P. cresphontes are rare in collections. The list above includes all of the records I could locate by polling knowledgeable MES members, surveying the literature, and visiting the U.S.N.M. collection at the Smithsonian Institution in Washington, DC. However, this listing is quite probably incomplete. Nevertheless, it does show that cresphontes occurs across western Maryland and that it extends toward the northeast at least as far as Baltimore City. Collection and sight dates in the list indicate that the species is on the wing from mid-May through early June and then again in August, suggesting that it probably is double brooded in Maryland. At least six specimens were taken and 16 additional sightings were made during the summer of 1979 alone. Thus, the species seems to have been unusually abundant in Maryland during the past season. (According to C.V. Covell, Jr. (pers. comm.), cresphontes was similarly abundant in southern Ohio at the same time.) Some of the Maryland specimens undoubtedly are of local origin, the most likely foodplant for the species in this region being prickly-ash (Clark & Clark, loc. cit.).

Acknowledgements

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NOTES ON BUTTERFLY COLLECTING IN MARYLAND IN 1979

John H. Fales and William R. Grooms

In 1979 the writers accompanied each other on weekly butterfly collecting trips in Maryland. Extensive collecting was done in the western, central and southern sections of the State, as well as the Eastern Shore, between April 18 and October 16. A total of 86 species were recorded, 33 of which were skippers.

The earliest species occurring from hibernation in the spring were Nymphalis antiopa (L.) and Polygonia comma (Har.) on March 18, in Calvert Co. Those emerging earliest from the pupal stage were Pieris rapae (L.) and Celastrina argiolus pseudargiolus (Bdv.& LeC.) on March 29, in Montgomery Co. The first Anthocaris midea Hbn. occurred there on April 10. Also Papilio philenor (L.), Papilio glaucus L., Graphium marcellus (Cram.) and Incisalia augustinus croesioides (Scud.) were flying there on April 11, and Mitoura gryneus (Hbn.) between April 18 and 28. C. gryneus was also taken in Calvert Co. on April 25. Incisalia henrici (Grt.& Rob.) was taken on April 29 in Calvert Co.

The first skipper recorded was Erynnis juvenalis (Fabr.) in Montgomery Co., on April 17. Erynnis icelus (Scud.& Bur.), Erynnis brizo (Bdv.& LeC.) and Epargyreus clarus (Cram.) were found in Washington Co. on April 24. Strymon melinus Hbn., Everes comyntas (Gdt.) and Phyciodes tharos (Dru.) were on the wing on April 21, in Calvert Co. The earliest seen northward migrating Danaus plexippus (L.) was on May 2, in Calvert Co. Butterflies were scarce on the Eastern Shore on May 1, although one species, Incisalia augustinus croesioides, was encountered in great numbers in Caroline Co.

Cynthia cardui (L.) was first noted on May 5 in Calvert Co., and it later became common between July 31 and October 30. It was in Somerset Co. on July 17, Montgomery Co. on August 14 and Caroline Co. on August 7 and 22. Junonia coenia (Hbn.) and Euptoieta claudia (Cram.) first occurred on May 10 and Poanes zabulon (Bdv.& LeC.), Limenitis archippus (Cram.) and Speyeria cybele (Fabr.) on May 22 in Calvert Co.

Amblyscirtes vialis (Edw.), Atrytonopsis hianna (Scud.), Polites coras (Cram.) and Hesperia metea Scud. occurred on May 20 in Baltimore Co.

Libytheana bachmanii (Kirt.) was taken in southern Maryland on May 25 and in Montgomery Co. on June 19. Lethe portlandia (Fabr.) and Lethe appalachia Cher. were common in Montgomery Co. on May 29 and again between August 8 and 16. A good example of hilltopping in butterflies was seen on Sugar Loaf Mountain in Frederick Co. on May 29.

Thorybes pylades (Scud.) was on the wing in Calvert Co. between June 5 and 24. Papilio cresphontes Cram. occurred in Montgomery Co. on June 8, 26, 27 and August 14 and 30. Harkenclenus titus (Fabr.) was there on June 26 and 27. Hyllolycaena hyllus, Asterocampa celtis (Bdv.& LeC.), Chlosyne nycteis Dbld. and Boloria toddi ammiralis (Hem.) were abundant in Montgomery Co. between June 19 and July 10. Atlides halesus (Cram.) occurred in Calvert Co. on June 22. This was a new county record.

Another new county record was the taking of Satyrium liparops (Lec.) in Montgomery Co. on July 3, and it was also collected in Worcester Co.

on July 10. Speyeria idalia (Dru.) was taken in Montgomery Co. on July 3 and in Washington Co. on July 24. Pieris protodice Bdv.& LeC. occurred in Charles Co. on July 7. Poanes massasoit (Scud.) was taken in Montgomery Co. on July 13, which was a new county record. Feniseca tarquinius (Fabr.) occurred in Baltimore Co. on July 20. The second brood of Mitoura gryneus occurred between July 17 and 27 in Calvert Co. and it was collected in Somerset Co. on July 17. The second brood of Calycopis cecrops (Fabr.) began on July 31 in southern Maryland. Euptoieta claudia was flying in Washington Co. on July 24.

Chlosyne nycteis was numerous on June 19 in Montgomery Co. and later between August 8 and 16. Eurema lisa Bdv.& LeC. first occurred in Calvert Co. on August 6. It was in St. Marys Co. on August 29, and it was common on September 9 in Montgomery Co.

Euphyes dion (Edw.) was collected on August 7 in Caroline Co. This was a new county record. Also collected there that day were Wallengrenia egeremet (Scud.), Calycopis cecrops, Atlides halesus and Lethe appalachia.

At the Seneca area in Montgomery Co. on August 14 the area was alive with butterflies, and 44 species were recorded. Interesting species present were Hyllolycaena hyllus, Libytheana bachmanii and Euptoieta claudia.

Erynnis horatius (Scud.& Bur.), C. cecrops and Parrhasius m-album (Bdv.& LeC.) were taken on August 22 in Caroline Co. The occurrence of A. halesus in Queen Annes Co. on this same date was a new county record.

On August 23 in Montgomery Co. (WRG) collected the first known specimen from Maryland of Oligoria maculata (Edw.). The same collector took a second specimen on August 31 in Worcester Co.

Epargyreus clarus was observed everywhere in Caroline Co. on August 7 when 40 individuals were seen mud-puddling. Then on August 22 there, this species occurred in "unbelievable numbers--no doubt thousands seen." This was in a soybean growing area. The University of Maryland has recently announced that this species of butterfly is now a serious new pest of soybeans in the Delmarva area.

Achalarus lyciades (Gey.) was taken in Calvert Co. on August 29. In St. Marys Co., on this same day, (WRG) took Polites vibex (Gey.). This was a new State record. A. halesus was also found there.

A specimen of Agraulis vanillae nigrior Mich. was taken (WRG) on August 31 near Stockton in Worcester Co. This marked the second collection of this species in Maryland by the same collector. The first was of two specimens taken in late August 1971 about four miles east of Salisbury, in Wicomico Co.

A number of trips were made in September to central and southern Maryland. Pieris protodice was taken in Montgomery Co. on September 3. Papilio palamedes Dru. was also taken there (WRG) on September 7, and this was a new county record. Eurema nicippe (Cram.) was common there that day.

The migration of Danaus plexippus appeared to begin in central Maryland on September 8 and in southern Maryland on September 12. Only scattered migrants followed during the next three weeks, when a weak flight occurred on October 7 and 8. Although they were seen nearly every day through October no pronounced flight was noted. Late individuals in Calvert Co. were migrating on November 24 and December 5.

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THE HOMOPTERA

Theodore L. Bissell

Homoptera means "same-wings", that is, the fore and hind wings have the same thickness throughout. They are usually held upright or sloping against the sides of the body when at rest. The piercing-sucking mouthparts consist of a beak and four lancets arising fom the back of the head, underneath.

Their near kin, the Hemiptera (half wings) sometimes called Heteroptera (unlike wings), also feed on plants by piercing and sucking, have the fore wings thickened basally, and usually hold them flat on the back. These are the true bugs.

The Homoptera include cicadas, leafhoppers, treehoppers, spittlebugs, aphids, whiteflies, scale insects, and some other groups. These insects are less than half an inch long, except the cicada which may be two inches long.

Of the cicadas (Cicadidae), improperly called locusts, there are

the periodical species, Magicicada spp., that appear in the spring, and the annuals, Tibicens spp., somewhat larger, that appear in mid and late summer. Their shrill calls from trees are characteristic. Strange indeed is the long underground period of development, 13 or 17 years, during which the growing nymphs suck food from tree roots. When the year of their emergence arrives they work upward through the compact soil often building chimneys above ground, then eventually climb trees for a few feet, cast their tawny skins at night and emerge as green or black winged adults.

Brood X of the periodical cicada, which appeared in 1970 and will come again in 1987, is the most plentiful in Maryland and Pennsylvania of all the 17 broods.

My first sight of these insects was at College Park in 1919. I was absent from Maryland in 1936 but saw them again in 1953 and 1970. Many of their habitats, particularly oak trees, have been eradicated but the cicadas come in thousands at the remaining stands. While the males sing the females slit the twigs to lay their eggs, with conspicuous injury to the trees. It is quite harmful to young trees, particularly to apples and ornamental shrubs, but serves as a natural pruning for large shade trees.

The leafhopper family (Cicadellidae) is quite large in number of species. Borror, De Long and Triplehorn (1976) say there are about 2500 North American species. The body is streamlined - rockets could have been modeled after them. Some are brightly colored though most species blend well with the color of their plant hosts. Some species, particularly the potato leafhopper, Empoasca fabae Harris, and the beet leafhopper, Circulifer tenellus (Baker), are very harmful in transmitting virus disease organisms between crop plants as they feed. Some of the larger leafhoppers are called sharpshooters as they sidle to the back side of a twig when an enemy or observer approaches.

Curiously shaped are the treehoppers (Membracidae). There is a large outgrowth of the prothorax extending back over the abdomen and often to each side, giving a bizarre or comical appearance. Some of these hoppers have the unusual habit of staying with the young in a mothering attitude.

Strangest in habits are the spittlebugs or froghoppers (Cercopidae). Soon after hatching from overwintered eggs the nymphs envelop themselves in froth by whipping up liquid drawn from the plants and voided. Eggs of the meadow spittlebug, Philaenus spumarius (Linnaeus), are laid back of the leaf sheaths on grass or grain stems an inch or so above the ground. Spittlebug feeding severely stunts red clover, strawberry, and many weeds.

The aphids (Aphididae) are my favorite family of the Homoptera, and it is a big family. A few years ago Dr. Mortimer Leonard and I (1970) catalogued the aphids of the District of Columbia, Maryland and Virginia. From the three areas we listed 180, 183 and 112 species, respectively, 282 species in all and there are more to be found. Smith and Parron recently listed 1380 valid species for North America.

A few species, melon aphis, Aphis gossypii Glover, and green peach aphis, Myzus persicae Sulzer, feed on many different plants and are responsible for spreading plant diseasss just like the leafhoppers, but most species of aphids stick to one plant or a few closely related ones.

Aphids have the ability to develop and reproduce rapidly, ten or twelve generations a year are not uncommon, so they are often seen in very large numbers. Again they can be quite scarce; lady bird beetles, lacewing flies, and other predators and parasites slay them at times.

A striking and definitive character is the manner of reproduction which is viviparous, females giving birth to living young (eggs hatch within the body), and it is parthenogenetic - generation after generation is produced consisting of females only. Males usually appear in the fall to fertilize special females that lay their eggs on tree bark to carry the species over the winter after green food has disappeared. But when plant food is provided continuously, as in a greenhouse, the females go merrily along reproducing all by themselves.

Another word about aphids. Most species have a pair of tube-like cornicles or siphunculi near the anal end which emit gases, supposedly to repel their enemies. These structures may be half as long as the body, again quite short or absent.

There was for a long time a false idea that honeydew, a common excretion of aphids, came from the cornicles. Actually it is dropped from the anus. People who park their cars under trees are well aware of the quantities of this sticky sweet stuff aphids produce. Many other Homoptera produce the same substance.

In most species of aphids there are both winged and wingless adults;

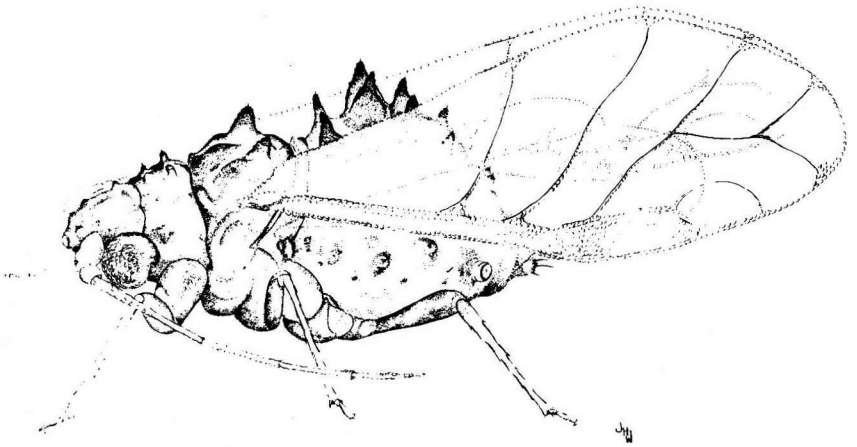

Fig. 1) The black pecan aphid, Melanocallis caryaefoliae (Davis), viviparous adult female. (From Maryland Agricultural Experiment Station MP 911 by Theodore L. Bissell.)

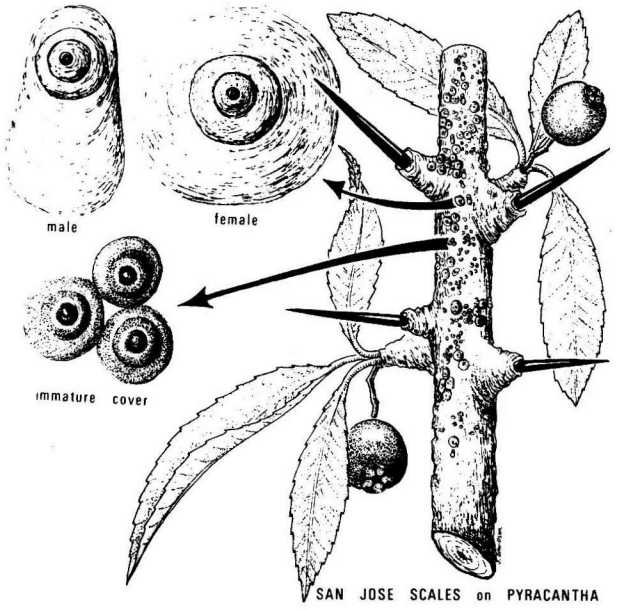

Fig. 2) San Jose scale, Quadraspidiotus perniciosus (Comstock). (From University of Maryland, Department of Entomology, Entomology Leaflet 11 by John A. Davidson & F.E. Wood.)

the first generations each year are wingless, then generations with wings appear. This gives the aphid the power to spread to other plants, often of a totally different nature, that is from tree to herbaceous plant. On the secondary host wings are again dispensed with until day lengths shorten and it is necessary to fly back to the primary (tree) host to oviposit and preserve the species. Usually males are equipped with wings while the egg bearing females or oviparae are wingless. But there are other aphid species in which all the viviparae are winged. These are tree inhabiting aphids without alternate hosts.

Whiteflies (Aleyrodidae) are usually just that, tiny white beings fluttering about plants and seen in large numbers, especially in greenhouses. The larvae stick to leaves like scale insects. The pupae have raised sides and are box-like. Strange to say some whiteflies are black.

I must mention one more group of the Homoptera, the scale insects (Coccoidea) creatures that become sedentary shortly after they hatch and as soon as they begin to feed on bark or leaf. There are armored scales, soft scales, pit scales, wax scales, mealybugs, etc., each constituting a separate family. Scales commonly devitalize trees and shrubs. Grasses and other succulent plants have their scale insects too.

In the scale insects only the males are winged. The immature males are smaller than the females and usually of distinct color.

The Homoptera constitute a very important group of insects, all of them taking their food from plants. There is probably no plant, at least of the terrestrial, that does not have its population of homopterous insects.

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T.L.B., 3909 Beechwood Road, Hyattsville, Md. 20782

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A MEMBER OF THE FAMILY

Looking among the phylla of the fauna,
The one with the most is the arthropoda.
There is the crab, lobster, spider and mite
But the butterfly is one that doesn't bite.

Albert D. Maizels, D.D.S., 1835 Eye St., N.W., Washington, D.C. 20006

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'TWAS EVER THUS

The nicest specimen you ever saw
Was a melanic promethea, without a flaw.
But, by dermestid larva, it suffered attack,
While pinned out on the drying rack.
A situation designed to tighten your jaw
And a perfect example of Murphy's Law!

R.S. Bryant, 522 Old Orchard Rd., Baltimore, Md. 21229

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The Maryland Entomologist is published irregularly by the Maryland Entomological Society. Original articles on geographic and temporal distribution, particularly pertaining to Maryland and adjacent states, ecology, biology, morphology, genetics, systematics, behavior, etc. are welcome. Book notices and reviews, news of the members, requests for information, notes on distribution, occurrence, migration and others will be published. All articles are subject to editorial review and acceptance. They should be sent to Robert S. Bryant, 522 Old Orchard Road, Baltimore, Maryland 21229.

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Text: Manuscripts submitted for publication in the Maryland Entomologist must be typewritten, entirely double-spaced, on one side only of 8½ X 11 inch typing paper. The first mention of a plant or animal in the text should include the full scientific name, with authors of zoological names. Underline only where italics are intended.

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_____. 1969. Moths and How to Rear Them. Funk & Wagnalls, New York. 235pp.

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Illustrations: Photographs may be accepted if they are necessary to support the text. Reproduction of photographs may increase the printing cost and authors should expect to pay any extra charges. Photographs should be approximately 2½ X 3½ inches (wallet size), black and white, glossy finish and mounted with frosted tape to an extra sheet of paper. Figure numbers, as cited in the text, and figure legends should be typewritten below each photograph.

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