NEWSLETTER of the Wisconsin Entomological Society

Volume 10 Number 1 — Dean B. Faber, Editor

March, 1982

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EDITOR'S NOTES:

This issue of the NEWSLETTER represented a unique situation for the editor. There was more material submitted than would fit! My thanks to all who contributed (the extra material will appear in the next issue of the NEWSLETTER).

There are two specific articles that I would like to comment on in this issue. First the 1982 schedule on pages 3-4. This looks like a really first rate program of speakers and activities. Second, the WES membership interest survey form on page 19. I urge you all to fill it out and mail it to the WES secretary. It's been years since such a survey was done and I believe it to be a very helpful way of putting society members with similar interests in touch with each other.

The death on January 22nd of Bill Sieker came as a shock to us all. As cofounder and past president of the WES, Bill contributed a great deal to Entomology in Wisconsin. His cheerful good humor and boundless enthusiasm for his beloved Sphingidae served as a wonderful example for all Wisconsin entomologists.

The NEWSLETTER of the Wisconsin Entomological Society is published several times yearly at irregular intervals. Send all news, notices, and contributions to: Editor, Wisconsin Entomological Society NEWSLETTER, c/o Dept. of Entomology, 237 Russell Labs, University of Wisconsin-Madison, Madison, Wisconsin 53706

William E. Sieker

(1911-1982)

William E. Sieker, noted attorney, conservationist and Lepidopterist died unexpectedly January 22, at the age of 70. Bill was instrumental in the creation of the Wisconsin Entomological Society. His enthusiasm and encouragement will be greatly missed.

Bill was born on September 5, 1911, in Milwaukee. He received a degree in Zoology from the Milwaukee State Teacher's College, and went on to graduate from the University of Wisconsin Law School in 1938. He practiced law in Madison for over 40 years, as well as serving as Justice of the Peace, Dane County Supervisor, Court Commissioner, and as a member of the City Board of Review and the State Tax Appeals Commission.

His interests encompassed a wide variety of conservation and nature-related areas. He was active in the Nature Con--servancy, the Ridges Sanctu--ary, and the Dane County Humane Society. He was a charter member of the Lepi--dopterists' Society. He served as president of the Madison Audobon Society, and two terms as president of the Wisconsin Entomological Society.

Entomologically, Bill will be remembered for his work with the Sphingidae, or Hawk Moths . He collected actively for nearly 50 years, building one of the largest and finest private collections of Hawk Moths in the world. He corresponded extensively and exchanged specimens with collectors in many parts of the world, and was widely recognized as a foremost authority on the Sphingidae. He shared his deep interests in entomology with young people, and encouraged many amateur entomologists throuhg his infectious enthusiasm and avid participation in a number of entomological organiza--tions.

Robert E. Silberglied

(1946-1982)

Bob died recently in the Air Florida crash on January 13th. He was a well known, and well liked young entomologist who worked with Lepidop--tera, especially mating behavior, communication, and taxonomy. He received his M.S. from Cornell and his PhD. from Harvard. Until recently he held positions at Harvard as Associate Professor of Biology and as Hessel Associate Curator of Lepidoptera. He also worked for the Smith--sonian and was doing field work at O.T.S. in Costa Rica. His presence will surely be missed by the entomological world. A memorial fund to support student research and training in tropical entomology has been established, and contributions should be sent to: Robert E. Silberglied Memorial Fund, Accounting Office, Smithsonian Institution, L'Enfant 3500 Washington, D.C. 20560

Wisconsin Entomological Society Meetings
(Tentative 1982 Agenda)
Speakers begin at 7:45 PM in 150 Russell Laboratories (U.W. Madison Campus) unless otherwise indicated. Socializing begins at 7:15 PM.

Feb. 16 (Tues. 7:45 PM)	Dr. William Atchley (Entomology Dept. U.W. Madison) will speak on "Entomology in the Underworld; An Australian/Antarctic Travelogue".
March 16 (Tues. 7:45 PM)	Dr. May Berenbaum (Dept. Entomology, University of Illinois) will speak on "Caterpillars, coumarins, and co-evolution".
April 17 (Saturday)	Open house at the Milwaukee Public Museum. Dr. Bob Murray will speak on "Insect Tigers - the beetle family Cicindelidae - Natural history and classification" Details of the days activity will follow in members monthly meeting reminder.
May 8 (Saturday)	Open house Division of Insects Research Collection at the Chicago Field Museum of Natural History (Dr. Larry Watrous and Dr. John Kethley will host. Details of this meeting and the Coevolution Symposium, all day on May 8th, will be forthcoming to members).
June ?	Weekend field collecting trip for entomologists (to be coordinated by personnel from the Chicago Natural History Museum and the University of Illinois-Urbana). Details to come later.
July/August	Collecting trip(s) (to be coordinated and announced by Les Ferge: Suggestions are welcomed!).
September 18? (Saturday)	Fall kick-off meeting and "Open House" at the Milwaukee Public Museum. Among two or three speakers (to be announced later), Dr. Gerald Noonan will present a slide travelogue of "Insect collecting in the South American Andes Mountains".
October 12 (Tuesday)	Dr. Michael Collins (Ph.D., Davis; Post-doctoral Research Associate, U.W. Madison) will speak on "Genetics and Ecology of California Hybrid zones in Hyalophora (Saturniidae: Lepidoptera)".
November 16	Dr. Robert Jeanne (Dept. of Entomology, U.W. Madison) "Up the Amazon with Net and Camera".
December 7 or 14	Speaker(s) to be announced. Election of Officers for 1983: Party!).

In addition to the above-scheduled events, several visiting professors (to Madison and to the Milwaukee Public Museum) are expected sporadically, and on short notice in some cases. We will try to have several impromtu meetings and notify members by mail as soon as is possible regarding specifics.

It is also hoped that a partial departmental open house can be arranged for a Saturday sometime this Fall (1982), which would permit more time for out of town members to "make a day of it". In this regard, I would also extend a continuous welcome to anyone wishing to visit and observe our Russell Lab mass-rearing, hand-pairing, and larval feeding experiments with Papilionidae and Saturniidae.

We hope that current members and new (or potential) members would submit their suggestions for additional events, activities in addition to any news, notices, or articles which you would be willing to share. A list of speakers in the Madison Department of Entomology Spring Colloquium Series is provided below for those interested individuals able to make it to Russell Laboratories (on Campus) for these events.

Entomology Department Colloquium Series
(Tentative Spring Semester Schedule)
(150 Russell Laboratoraies)

Feb. 15 (3:30 PM)	Dr. Walter Gojmerac (U.W. Madison) "Historical Development of Current Programs in Livestock, Food Handling and Household Insects"
March 1 (3:30 PM)	Dr. William Bowers (Cornell University)
March 8 (3:30 PM)	Dr. John Wedberg (U.W. Madison)
March 17 (Noon)	Dr. May Berenbaum (U. Illinois,-Urbana)
April 12 (3:30 PM)	Dr. Dan Mahr (U.W. Madison)
April 19 (3:30 PM)	Dr. Mary Jane West-Eberhard (Smithsonian Tropical Res. Institute) Sexual selection, social competition, and speciation"
April 26 (3:30 PM)	Dr. Bradford Rence (Lawrence Univ.) "Exogenous effects on the circadian rhythms of stridulation in a cricket: their properties and what they reveal about pacemakers"
May 3 (3:30 PM)	Dr. Jeff Wyman (U.W. Madison)
May 10	Dr. Gerald Noonan (Milwaukee Public Museum)

Date is presently undetermined for Phil Pelliteri (U.W. Madison)

In regard to other events of possible interest, please note that the 5th Annual Spring Systematics Symposium (Sponsored by the Chicago Field Museum of Natural History and the National Science Foundation) will be on "Coevolution" on May 8th. Details regarding registration ($5.00) for the day and speakers are available in Evolution (1981) (Volume 35, page 1127) or contact Mark Scriber (608-263-6277) or Sue Borkin (8-414-278-2756).

INSECT DIAGNOSTIC LAB REPORT:

1981 in Summary

It is that time of year in the Insect Diagnostic Lab to look back at 1981 and see what insects had "good years", and which critters tallied the greatest # of telephone calls into the Department of Entomology. Each year seems to have its own special flavor.

Suprisingly one of the most common telephone questions was about the Med. Fly. People were concerned if the fruit in the super markets was infested, if eating infested fruit would harm you, and when will it get to Wisconsin. I have never seen one insect capture the public curiosity and imagination as has this little friend of the California's governor.

We had calls from Milwaukee and Madison concerning large numbers of blackish moths (10-15/sq. ft.) covering the sides of peoples homes. Because of the recent introduction of Gypsy Moth into the state, homeowners blamed this eastern import. Samples proved to be adult variegated cutworm, Peridromia savcia (Hübner). The moths disappeared almost overnight, and I suspect strong nightlights had something to do with attracting these moths to the homes.

The Black Carpenter Ant, Camponotus pennsylvanicus, always total #1 in the calls coming into the Department of Entomology. This ant strikes terror into peoples hearts, and cause visions of homes being destroyed overnight, and falling into rubble. In reality, colonies are often 3 years old before people discover them. Carpenter ants nest in weakend, water damaged wood, and feed on insects and other protein containing materials. They have a sneaky way of getting into dishwashers to feed on food scraps and debris on plates. For the first time, a sample of a termite infested home, came into the lab. The sample was from Green County.

Things were rather quite in the Agricultural area. Potato leafhoppers popuations were extremely high, and the potatos, alfalfa, and strawberry crops suffered significant damage. Armyworms, Alfalfa weevil, European corn borer, and the cutworms behaved themselves this season.

Indoors this was the year of dog and cat fleas. Fleas, which love to attack people's ankles when no pets are available, exploded this fall. One can speculate that the mild winters have caused increased survival, but the real caused is a mystery.

In the fall, a number of larvae of the big saturniads, such as S. cecropia came in. Many people are convinced these 4 inch worms will eat their dog and kids. I can be sure next summer when the adults are on the wing that the calls about the "Monster in the back yard that must be new to science" will continue.

The number of fall wasp complaints was way down, as population of the Vespids were low. The recent introduction of Vespula germanica, with its love of urban settings and agressive behavior will change that for 1982 I'm afraid.

I hope the New Year finds you well, the spring finds us early, and the "bugs" don't find your garden.

Phil Pellitteri

Foodplants and Ecology of Tiger Swallowtail Butterflies

by Mark Scriber

As a species, the eastern tiger swallowtail butterfly, Papilio glaucus L. is the most polyphagous of all 540 species of Papilionidae (Scriber, 1973), and has been reported to feed upon plant species of at least 13 families. The Canadian subspecies, P. glaucus canadensis R & J, is generally believed to be everywhere univoltine, to be devoid of the genetic capacity for dark morph females, and to have certain morphologically distinct characteristics, making it different both in appearance and biology from P. glaucus glaucus L. (Ebner, 1970; Tyler, 1975). In addition, the choice of potential food plants north of the 42-44° latitudinal floral and faunal "suture zone" (Curtis, 1959; Remington, 1968; Fig. 1) is devoid of many species from the southern contingent of hosts (e.g. tulip tree, Liriodendron tulipifera L., mountain magnolia, Magnolia acuminata L., and sweet bay, Magnolia virginiana L., of the Magnoliaceae; sassafras, Sassafras albidum (Nutt.), and spicebush, Lindera benzoin L., of the Lauraceae; and the common hoptree, Ptelea trifoliata L., of the Rutaceae). While the southern subspecies, P. glaucus glaucus uses all of these plants, none have been reported for P. glaucus canadensis (McGugan, 1958). Sweet bay is the primary, if not the only, host in the southern third of Florida, where tulip tree, cherry and ash do not occur.

Paper birch, Betula papyrifera Michx., and trembling aspen, Populus tremuloides Michx. have been the most frequently reported host plants for P. glaucus canadensis across most of Canada (McGugan, 1958; Brower, 1958). However, it appears that wherever they occur within the range of P. g. canadensis (eg., northern Wisconsin and northern Michigan), wild black cherry, Prunus serotina Ehrh., and white ash, Fraxinus americana L. seem to be favored host plants of the Canadian race (M.C. Nielson, personal communication; J. Mertins, personal communication). In addition to trembling aspen and black cherry, we have also observed P. glaucus canadensis oviposition and/or larvae feeding upon choke cherry, Prunus virginiana L., and big-toothed aspen, Populus grandidentata Michx. in northern Wisconsin and the Upper Penninsula of Michigan (Scriber et al., 1982).

We have found a general inability of P. g. canadensis larvae from Wisconsin to survive even the first instar on tulip tree (Magnoliaceae) and spicebush (Lauraceae), sugesting that these southern plants would be unsuitable hosts even if the geographic ranges of these plants did overlap with the canadian race of the tiger swallowtail. In contrast however, mountain magnolia, sassafras, and common hoptree are quite suitable hosts for the northern Wisconsin swallowtail race even though they do not naturally occur anywhere in northern Wisconsin. The greatest survival, fastest growth and largest pupae were obtained for larvae fed black cherry and trembling aspen.

Unlike the case for P. g. canadensis, P. g. glaucus larvae from both dark morph and yellow morph females survive and grow well on tulip tree but do very poorly on trembling aspen. This particular reciprocal inability of one race to survive on the other's favorite host is geographically more widespread than Wisconsin, may be of considerable co-evolutionary significance, and is presently under investigation in our laboratory. We hope to obtain Papilio glaucus from as many Wisconsin counties and other states as possible this year

(and in the future) for larval rearing and hand-pairing, as well as for analysis of morphological features. We hope to clarify the biology and genetics of subspecies differences in foodplant utilization abilities, diapause biology, as well as color, size and other morphological characteristics.

Correspondence (especially regarding foodplant records), specimens (live will permit electrophoresis analyses), and visits to our laboratory are sincerely welcomed. We are located across from the main Entomology Office in 240 Russell Laboratories. A phone call (at local peak flight times) this season would also be appreciated (608) 263-6277. Our primary collecting, rearing, research crew includes Mark Scriber, Mark Evans, Les Ferge, Greg Lintereur, and Dave Ritland.

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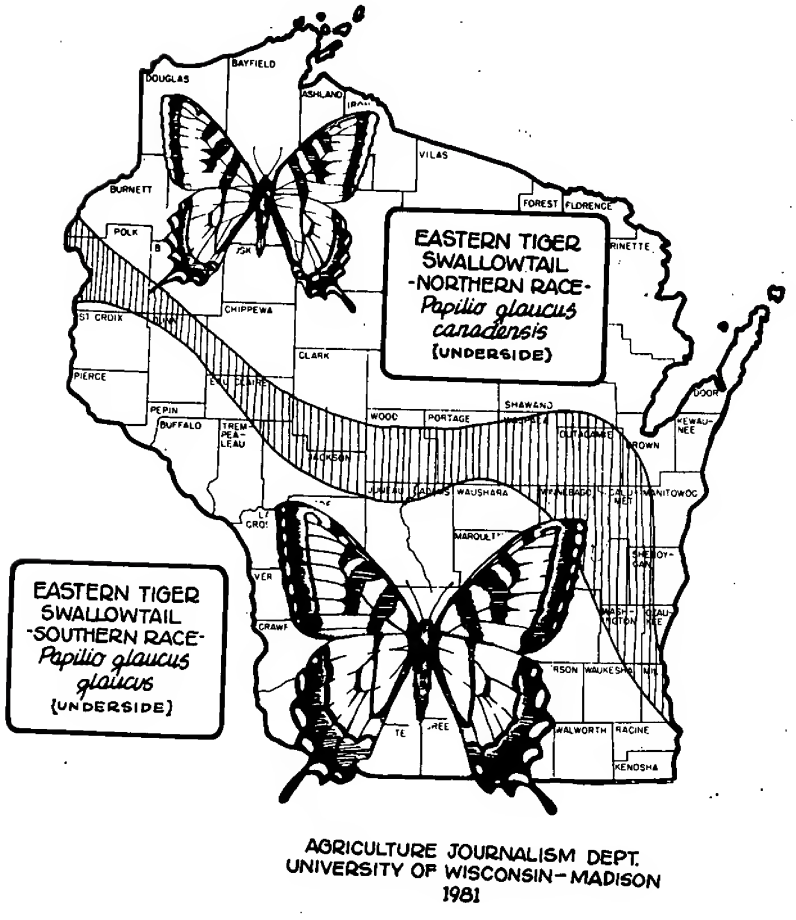


Fig. 1 The plant tension zone in Wisconsin, and two subspecies of Papilio glaucus.

THE POTENTIAL THREAT OF THE GYPSY MOTH IN WISCONSIN

by Les Ferge

The purpose of this paper is to summarize the current distribution and status of the Gypsy Moth, Lymantria dispar (L.), in Wisconsin, and assess the potential impact of this defoliator on Wisconsin forests. Susceptible forest cover types and site conditions in eastern United States outbreak areas will likely have similar counterparts in Wisconsin. Extensive data on the Gypsy Moth, collected for nearly a century, offer a basis for predicting the threat of this species in newly infested areas.

The Gypsy Moth was introduced in Medford, Massachusetts in 1869, for use in experiments involving silk production. Live material escaped and soon increased to outbreak proportions, Ferguson (1978). The species became unbelievably abundant in the Boston area twenty years after its introduction. Hordes of larvae caused complete defoliation in a 359 square mile area, literally covering buildings and yards. Infestations subsequently became established in the New England states and Pennsylvania, with recent scattered detections in several states to the west. The insect is a notable "hitch-hiker" on vehicles, and may also be transported on household goods being moved and nursery stock. Its indiscriminate placement of egg masses on these items in outbreak areas, and their subsequent long-distance movement, has enabled the moth to gain a foothold as far away as Wisconsin and California.

The first detection of the Gypsy Moth in Wisconsin occurred in 1971, at Mill Bluff State Park in Monroe County. Consequently, detection efforts were stepped up, with placement of increased numbers of pheromone traps baited with the pheromone Disparlure. There were no further detections until 1975, when five male moths were caught in Appleton and single specimens taken in Manitowoc and Elkhart Lake. A larva reported collected by a student in Bayfield County near Clam Lake was determined to be this species as well: the validity of the location has not been confirmed. One moth was caught in Madison in 1976, as were single moths at the Appleton, Manitowoc and Elkhart Lake sites it was detected at the year before. Detections in 1977 included single moths at North Freedom, Sauk County, and Madison, as well as several from Oconomowoc, Waukesha County. Single moths were taken in 1978 at Devil's Lake State Park in Sauk County and Madison, but the Oconomowoc population increased alarmingly, as 64 egg masses were found that fall. In 1980 eight moths were captured in the City of Milwaukee. This introduction was made via infested nursery stock brought in from New Jersey, a state with a history of Gypsy Moth problems. Captures in new areas jumped markedly in 1981, with 16 new sites reported in six counties. The most significant population was found in Monona, Dane County, where 236 moths were trapped. Further spread was noted in the Milwaukee area, where moths appeared in seven suburban areas. This detection information was obtained from the Wisconsin Department of Agriculture Cooperative Pest Survey Bulletin and from reports of the Gypsy Moth Ad Hoc Committee. The distribution of these records is shown in Figure 1.

The pattern of moth captures closely follows the routes of the Interstate and other major highways, thus pointing to "hitch-hiking" egg masses as the primary means of introduction. Some of the records may be the result of adult moths hiding in cars and escaping later in distant areas. Recreational

FIGURE 1. GYPSY MOTH DETECTION RECORDS IN WISCONSIN

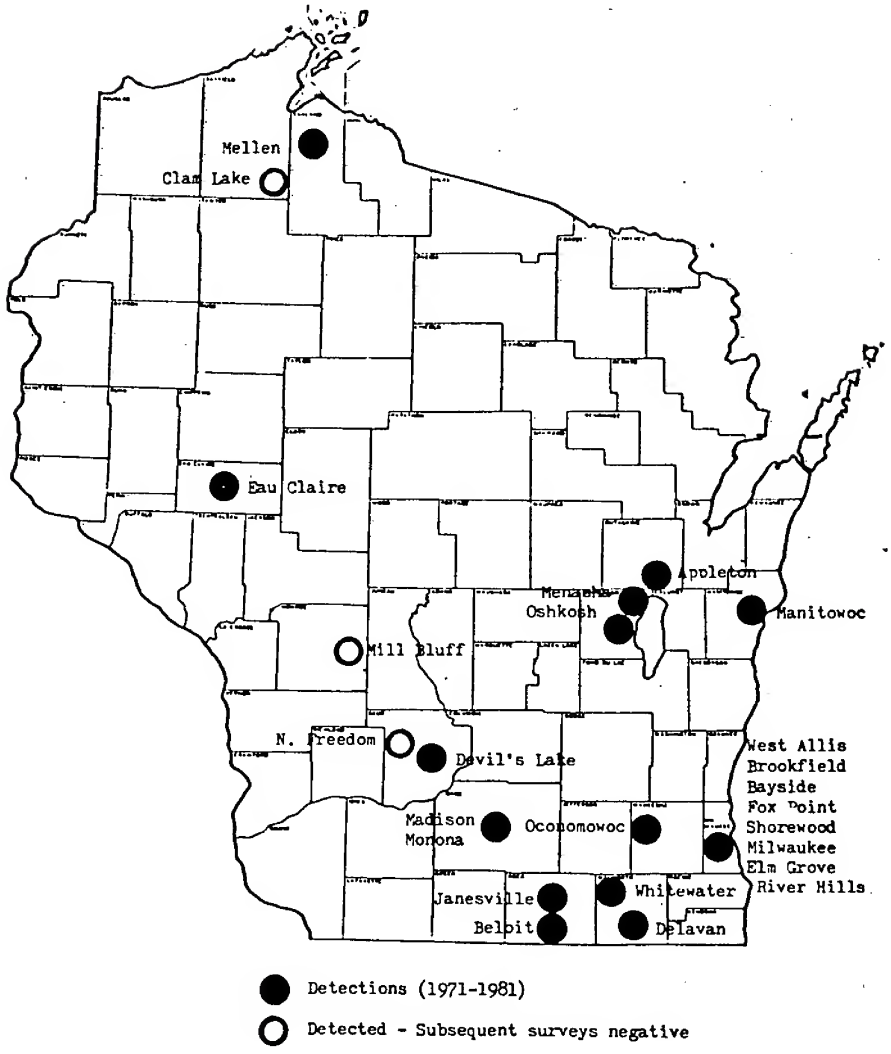


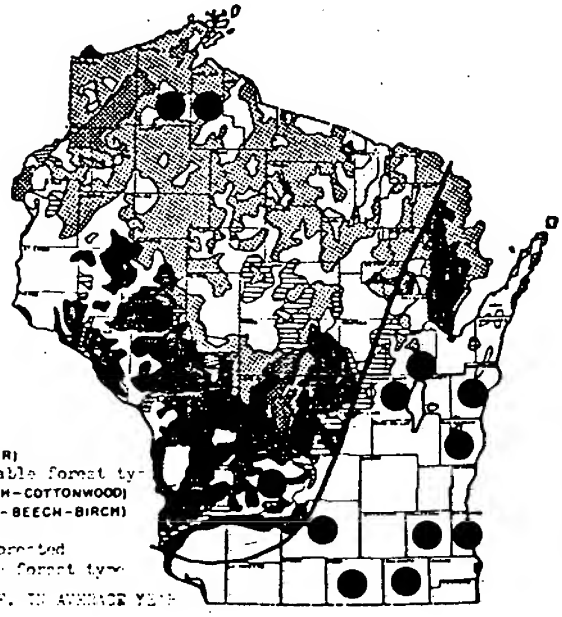
FIGURE 2. POTENTIAL FOR GYPSY MOTH OUTBREAKS.

Outbreaks more frequent in area southeast of red line (favorable climate & forest).

Outbreaks less frequent and scattered within favorable forest type northwest of line.

MAJOR FOREST TYPES

IN WISCONSIN, 1956



LEGEND

- WHITE - RED - JACK PINE
- SWAMP CONIFERS (SPRUCE - FIR)
- OAK (OAK - HICKORY) [illegible] forest ty
- LOWLAND HARDWOOD (ELM - ASH - COTTONWOOD)
- NORTHERN HARDWOOD (MAPLE - BEECH - BIRCH)
- ASPEN - BIRCH
- NONFOREST [illegible] or less forested but mostly [illegible] forest ty
- [illegible]
- [illegible]

SOURCE LAKE STATES FOREST EXPERIMENT STATION; "WISCONSIN FOREST RESOURCES," STATION PAPER NO 90; 1961.

vehicles may facilitate introductions into the State Parks and private campgrounds. Movement of household goods from an infested area is suspected to be the cause of the Appleton infestation.

Control measures were carried ot at Oconomowoc in 1979, consisting of two applications of Gypcheck virus in late May and early June to reduce the larval population, and one application of Disparlure pheromone upon adult moth emergence, to disrupt mate location by the males. These measures, aided by some severe winter weather, seemed to be effective, as 1980 trapping recovered only 28 moths. The Appleton area was very intensively trapped using Disparlure (3 traps/acre in one square mile), resulting in a total catch of seven moths.

The ecology of susceptible and resistant forest types and site conditions in New England was analyzed by Bess, Spur and Littlefield (1947). The Gypsy Moth will feed on most species of hardwoods, as well as a few conifers, particularly when mixed with favored hardwoods. The most preferred hosts are the oaks, gray birch and poplar. However, the mere presence of favored hosts, or their proportion, does not necessarily indicate the susceptibility of a stand. All favored food species are not defoliated equally under all conditions, and non-favored species may be defoliated when environmental conditions become highly suitable for larval development.

The most obvious characteristic of susceptible stands in southern New England is the generally dry, open condition. These sites have light sandy or gravelly soil, a history of repeated fires, canopies covering less than half the ground, and short, scrubby timber. Indicator tree species in the overstory are Black, Scarlet and White Oaks, Gray Birch and Aspen. the understory contains Scrub Oak, and an abundance of White Pine and White Oak. The ground cover is also an indicator of susceptibility. Abundant blueberry, sweetfern and bracken, plus little or no leaf litter have been associated with susceptible stands.

Resistant stands exhibit quite a different appearance, characterized by loamy soils, full stocking, having a moderately dense canopy, vigorous growth, and a well-developed forest floor with a deep layer of litter. Ground layer and litter are important ecologically. Larger larvae hide by day in the litter, and are more accessible to predation by small mammals, as related by Campbell (1975). Indicator tree species in both the overstory and understory are Sugar Maple, White Ash, Black Birch, Basswood, Yellow Poplar, Hemlock and Beech. Ground layer vegetation indicators include abundant wild sarsaparilla, mapleleaf viburnum, and certain species of ferns.

Changes in forest stands in response to Gypsy Moth defoliation were studies by Campbell and Sloan (1977). The overall conclusion was that stand responses to massive outbreaks tend to cause somewhat of a Gypsy Moth-forest equilibrium. This is accomplished by selection, within a given species, for trees less susceptible to defoliation, and changes in stand composition. Defoliation was greatest during the first years of an outbreak. Trees in poor condition or subdominant (more likely stressed) were most likely to die after defoliation. Two successive heavy defoliations caused higher mortality than a single one. When overall defoliation was low, almost all defoliation was of preferred host trees, but in large outbreaks, other less-preferred species also were defoliated. Overall, the proportion of preferred trees was

reduced. These defoliation-caused changes seem to accelerate the natural process of succession.

Given the complex interaction of conditions that render an area vulnerable to Gypsy Moth defoliation, it is difficult to rate the potential for outbreaks on the basis of forest types alone. Bess, Spur and Littlefield (1947) indicate the northern hardwood and spruce-fir regions are particularly resistant, because of the low level of favored food species. The large outbreaks in New England were in the general Oak-Hickory type, as classified by The Society of American Foresters (1980). This type also exists in parts of Wisconsin, predominantly in the west-central region, as indicated in Figure 2. Although the southeastern third of the state is classified as non-forest, having 15% or less of the land area forested, what forest remaining is mostly this Oak-Hickory type.

The work of Curtis (1959) gives detailed insight into specific plant communities and forest types in Wisconsin. The southern xeric forest will likely be susceptible. It is dominated by White, Red and Black Oaks, forming stands with closed canopies. They are located on well-drained often sandy sites in the southern half of Wisconsin. They comprise the bulk of farm woodlots in the region, in blocks of 40 acres or less. Site conditions of these woodlots would render them vulnerble to the Gypsy Moth. Cattle grazing has led to loss of reproduction, decrease of canopy coverage, loss of diverse ground layer vegetation and forest floor litter, and soil compaction, decreasing water-holding capacity and ultimately stressing the trees. The oak openings and barrens, savanna communities having less than 50% canopy coverage, may also be vulnerable. These areas are located on outwash sand in the Wisconsin River valley from Portage to Arena, and upland in Marquette and Waushara Counties. The Oak-Pine forests of the central sands region may also be attacked. Trees in suburban areas in the southeastern third of the state, where most of the Gypsy Moth records are, will likely be susceptible because they are open-grown, and more likely to be stressed. Natural ground cover and leaf litter are lacking, making the habitat ecologically unsuitable for the buildup of predators.

Much of northern Wisconsin may be spared from Gypsy Moth outbreaks due to severe cold winter temperatures. Hall (1976) cites a USDA prediction that no outbreaks will occur north of a line where at least 25% of the years have minimum temperatures of -25°F., which is lethal to the eggs. This line is plotted in Figure 2. The area south-east of this line will experience more frequent outbreaks due to higher egg mass survival coupled with the availability of susceptible wooded areas. The greatest continuous areas of susceptible Oak-Hickory forest lie north of the line. Scattered outreaks will likely occur, but will become less frequent northward. However, adaptation in moth behavior may eventually change this, in the egg masses deposited closer to the ground will be protected from extreme temperature by snow cover.

In conclusion, it appears that the Gypsy Moth will eventually occur statewide, but will not outbreak all over, particularly in the northern region. The major impact of outbreaks will be in suburban and recreation areas, causing esthetically displeasing defoliation and the nuisance of crawling larvae. Farm woodlots will suffer unless steps are taken to prevent further land abuse and develop healthier biological conditions. Hall (1976) states that foresters are not overly concerned because the dollar loss has

seldom been enough to justify the expense of a treatment program. Despite loss of increment and some mortality, the economical management option is to let defoliation happen, and then salvage any dead trees with marketable value.

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Why Detection of the Midwest's Newest Corn Pest Originated in Wisconsin

by Mark Scriber and Bruce Giebink

A native insect, Hydraecia immanis Guenee, (Noctuidae: Lepidoptera) has, within the last 4-5 years, become a serious local concern to corn growers in at least 36 counties of four midwestern states. This insect, the hop vine borer, was known during the last century only as a minor pest of hops (Humulus lupulus L.) until the mid-1970's when heavy localized damage was first detected in 8-12 Wisconsin corn fields (Extension reports from Dane, Grant, Green Iowa, Lafayette, Richland, and Sauk counties). Originally the Wisconsin specimens were misidentified as the closely related potato stem borer Hydraecia micacea (Esper). The damage caused by both of these Hydraecia species is very similar (wilted center whorls and eventual death of young corn plants, caused from larvae feeding at the growing point below ground level). Godfrey (1981) has very nicely clarified the history, biology, and taxonomic differences between the native North American H. immanis and the introduced H. micacea (see also Hawley, 1918). We will, however, offer an abbreviated description in order that some readers of this newsletter might be able to report new infestation areas this May and June.

Description (after Godfrey, 1981; and Hawley, 1918):

The body color of both H. immanis and H. micacea is sordid white with violet-pink transverse bands on thoracic and abdominal segments (T2 through Ab8). In both species the banding pattern fades as full size is approached (Figs. 1 and 2). The heads (final instar) of both are orange to reddish brown with mandibles reddish brown to black. The final instar larvae of immanis may reach lengths of 48 mm (nearly 2 inches) and can be distinguished from micacea by the white lines interrupting the purple bands.

Life History and Habits (Hydraecia immanis):

There are usually six (sometimes 7) larval stages which are described in detail by Hawley (1918). The first instar larvae are believed to appear in May (from overwintering eggs laid on grasses and/or sedges during late August or early September) and feed on grasses during this larval stage, after which they would enter corn plants as early second instars.

Damage (detectable as wilted center whorl leaves, Fig. 3) is spotty or patchy within a single field. It is believed that a single larva in Wisconsin rarely feeds on more than one or two corn plants during its life cycle, in spite of previous implications that these large hardy feeders may kill or damage several consecutive plants in a row. Nonetheless, many such larvae can cause serious damage. Muka (1976) reports stand reductions of 50 percent and cases where entire 20 acre cornfields were completely destroyed by H. micacea in the eastern U.S. and Canada. One county in Minnesota had infestations of H. immanis which were severe enough to necessitate replanting of 2000 acres of corn in 1979 (Godfrey, 1981).

When feeding is complete (around the middle of July in southwestern Wisconsin) the larvae pupate in the soil, often within a foot of the dead plant last fed upon. The pupal stage lasts approximately 4-6 weeks, with

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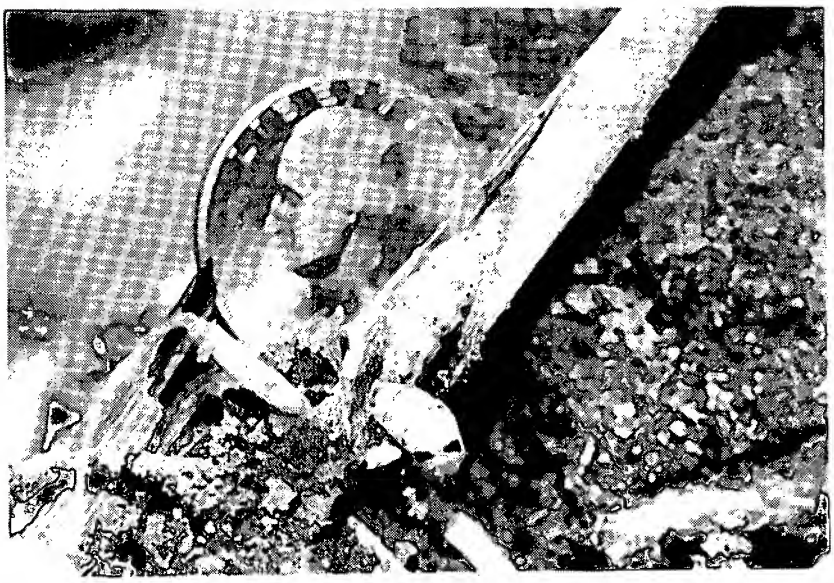
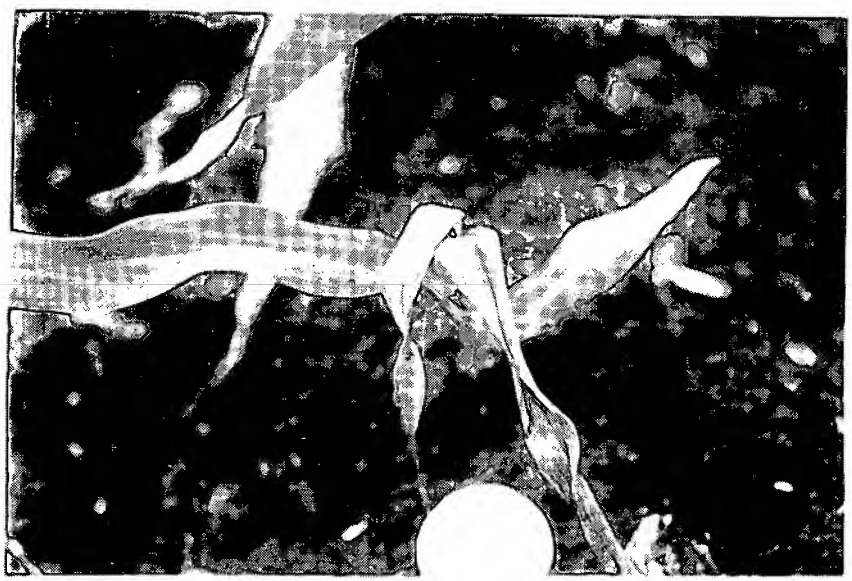


3B

3A



adult moths emerging in late August and September. Mating may take place locally, and eggs (as many as 850 per female) are presumed to be deposited on grass and perhaps sedges in or near the cornfield. These eggs overwinter and thus there is but one generation per year (Fig. 4).

Distribution:

While the potato stem borer (H. micacea) is a polyphagous European species which has been accidentally introduced into the northeastern U.S. (Muka, 1976) via Nova Scotia and Ontario, the hop-vine borer (H. immanis) is native to North America (Hawley, 1918). Adult moths have been collected in 1885 from central Illinois and in 1926 from Racine Wisconsin (see Godfrey, 1981) and also more recently from Mazomanie, Wisconsin (Lee Lovett, pers. comm.), however the species was basically unknown in the midwest in the larval stages until the mid-1970's when local damage was observed in several Wisconsin cornfields (June 16, 1978 Wisconsin Pest Manager 1(4): 2 and E. Fisher, pers. comm.). Since this time, other local infestations have been detected in northern Illinois, northern Iowa and southeastern Minnesota (see Fig. 5).

Control:

Elimination of grassy weeds in cornfields will deny suitable oviposition sites to the fall-ovipositing females. In the spring, hatching larvae on weeds may easily move to nearby corn plants, thus fall weed control would be preferable. Rotation to a non-corn crop would certainly help bring populations under control. To date, there seems to be little control possible with conventional corn rootworm insecticides, however other chemical application methods are presently under investigation.

There are few known natural enemies of the hopvine borer. Its principal predator hunts only at night and locates the larvae below ground level by the sound of its chewing inside the plant; however these skunks will likely miss the sessile pupae. Mass release efforts of this particular biological control agent is not therefore advised.

It seems that the hop-vine borer has become more evident during recent years. Continuous corn, poor weed control, and conservation tillage may bring this species into greater prominence (Scriber, 1982). Samples suspected of being Hydraecia immanis should be sent through your county extension agent to the insect diagnostic laboratory.

Why Wisconsin?

As indicated by its common name, the hop vine borer, had been found in close association with hop (Humulus lupulus) plants. Wild hops (found from the east coast of the U.S. to the Rocky Mts.) presumably served as the primary host for the insect in North America and also for the more polyphagous potato stem borer, H. micacea, in Europe (which is also a problem in corn and potatoes).

Because hops are a key flavoring ingredient in beer, and because beer was such a critical socio-economic factor for the pilgrims and early European-American settlers, the commercial production of hops has always been

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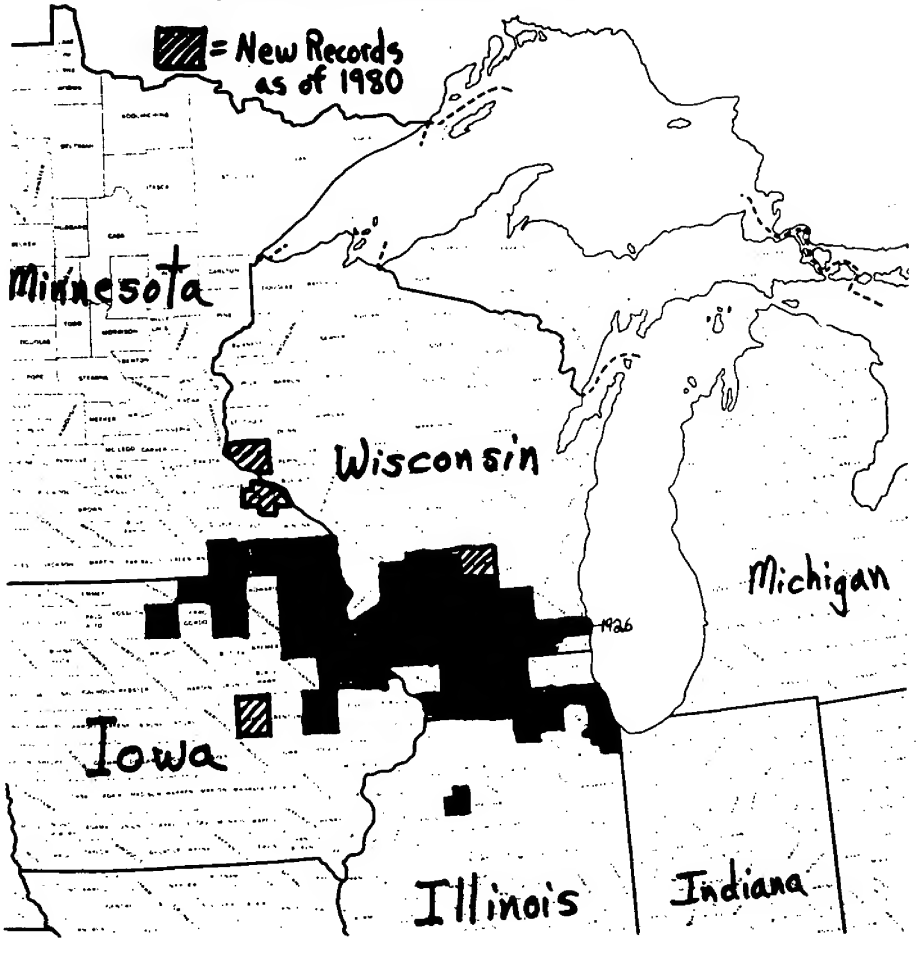
Hop Vine Borer (Hydraecia immanis)

■ = Distribution as of 1979

▨ = New Records as of 1980



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intense. New York State and Wisconsin became the leading producers throughout the latter half of the 19th century, however climate, plant disease, and insect problems contributed to a decline in production toward the end of the 19th century. The West Coast states (Washington, Oregon, Idaho, and northern California) surpassed New York and Wisconsin in production by 1900, and today represent the only commercial production sites in the U.S. (approximately 60% of the world's production; Burgess, 1964; Schwartz, 1973; Al Haunold, pers. comm.). At one point in the 1860's the work force in a single Wisconsin county (Sauk) was in excess of 30,000 persons, and the hop crop was 4 million pounds (Schwartz, 1973). One final unsuccessful attempt to revive commercial production after the prohibition era was attempted in Sauk County in the 1930's. There has been essentially no commercial hop production since this time east of the Rockies.

In our research investigations with H. immanis, we have located small patches of wild or escaped hops along roadsides and drainage ditches near some of the most intense infestation sites in cornfields. It would appear that the hop vine borer has been able to make the transition from its grass/hops feeding habit to a grass/corn feeding pattern in these areas. This transition has certainly been favored by the current trends toward continuous corn production (a dependable resource locally after the 1940's). Thus, the conditions would appear to have been appropriate for such a switch for several decades, and the reasons for the lack of problems in corn in the 1950's, 1960's, and early 1970's are unknown. It is possible that the general use of chlorinated hydrocarbons in the 2 decades previous to 1970 maintained a general suppressive effect upon H. immanis. It is also possible that small population pockets in association with wild hops have only recently been forced onto corn with removal of perennial hop plants along field edges (e.g. with changing agronomic practices and/or increased herbicide use). In any case, the current ability and actual use of corn as food for hop vine borers in the midwest (and New York) is reason for concern, and will probably result in the inclusion of this noctuid species in future economic entomology textbooks as a pest of corn.

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Muka, A. 1976. A new corn pest is south of the border. Hoard's Dairyman 121: 688.

Scriber, J.M. 1982. Nitrogen nutrition of plants and insect invasion. chapter 34 In: (R.D. Hauck, ed) Nitrogen in Crop Production. Amer. soc. Agron., Madison, WI, (in press).

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WES Kettle Moraine Field Trip - 11 July, 1981

Lepidoptera collected/observed along railroad tracks east of State Forest Headquarters near Eagle. Right-of-way transected oak forest, marsh and prairie habitats.

The following data were contributed by Sue Borkin, Meridith Platt, Maria Plonczynski, Jim Parkinson and Les Ferge:

HESPERIIDAE - Skippers
Polites coras Peck's Skipper
Polites origenes Cross-Line Skipper
Wallengrenia egeremet Broken Dash
Euphyes conspicua Black Dash
Euphyes vestris metacomet Dun Skipper
Poanes massasoit Mulberry Wing

NYMPHALIDAE - Brush-Footed Butterflies
Limenitis astyanax Red-Spotted Purple
Limenitis archippus Viceroy
Vanessa atalanta Red Admiral
Cynthia virginiensis American Painted Lady
Speyeria aphrodite Aphrodite Fritillary
Phyciodes tharos Pearl Crescent
Euphydryas phaeton Baltimore

ARCTIIDAE - Tiger Moths
Haploa militaris Military Moth

PIERIDAE - Sulfurs & Whites
Colias eurytheme Alfalfa Butterfly
Eurema lisa Little Sulfur

LYCAENIDAE Coppers-Blues-Hairstreaks
Satyrium calanus falacer Banded Hairstreak
Satyrium edwardsii Edward's Hairstreak
Satyrium acadica Acadican Hairstreak
Harkenclenus titus Coral Hairstreak
Celastrina argiolus Spring Azure
Everes comyntas Eastern Tailed Blue

SATYRIDAE - Wood Nymphs
Lethe anthedon Pearly-Eye
Euptychia cymela Little Wood Satyr
Cercyonis pegala nephele
Clouded Wood Nymph

1981 Treasurer's Report

Balance in account 31 December 1981	$213.77
Total disbursements (for postage and printing costs)	$189.29
Total receipts (membership dues and contributions)	$399.00

There were eight sustaining memberships at $10.00 (S. Borkin, G. Esenther, R. Habermehl, M. Klein, G. Lintereur, J. Parkinson, D. Radke, R. Topczewski)

There was one patron membership at $25.00 (L. Ferge)

Balance in account 5 January 1982 $423.48

Receipts for 1981 were $209.71 greater than disbursements. The increase in dues from $2.00 in 1980 to $4.00 for 1981 considerably improved the financial condition of the Society over 1980 when $175.97 more was spent than was received in dues. The society should be financially able to add illustrations to its newsletters published in 1982

NOTICE:

The WES membership application form is reproduced below. I would like to request that all members fill it out and return a copy to: Secretary, Wisconsin Entomological Society, 237 Russell Laboratories, University of Wisconsin, Madison, Wisconsin 53706. The Society is conducting a survey of members current entomological interests. The last such survey was conducted a number of years ago. In the next issue of the NEWSLETTER we plan to include a complete list of active WES members and their addresses and current entomological interests.

Thank you. editor.

WISCONSIN ENTOMOLOGICAL SOCIETY
MEMBERSHIP APPLICATION

Please Print:

_____
Last Name First Name

_____
Address: Street City State Zip

_____
Phone (including area code)

GENERAL INTEREST AREA(S)

____ Apiculture
____ Aquatic Insects
____ Behavior
____ Collecting
____ Ecology
____ Inscct Photography
____ Life History
____ Morphology
____ Physiology
____ Systematics
____ Taxonomy
____ Other (SPECIFY):

ORDER(S) OF INTEREST

____ Lepidoptera
____ Coleoptera
____ Hymenoptera
____ Diptera
____ Homoptera
____ Hemiptera
____ Other (SPECIFY):

PARTICULAR FAMILIES AND GENERA OF INTEREST: