NEWSLETTER

of the

MICHIGAN ENTOMOLOGICAL SOCIETY

Volume 18 Number 1 March 6 1973

AMATEUR INSECT COLLECTING: A SCIENTIFIC CONTRIBUTION

by Roger C. Bland

What insect collector has not found an unusual specimen new to him and, knowing the odds were probably against him, hoped that he had revealed a previously undescribed species? If a good library was available a rapid research of the taxonomic literature followed, or the insect was mailed to a museum or entomology department of a university only to find that the species was discovered and described in detail perhaps 50 years ago! After a few similar disappointments, it is not surprising that many amateur insect collectors (and some professional entomologists) assume that if a certain species has been known for many years, abundant biological data on this organism also have been well documented--and probably years ago by eminent, ubiquitous collectors who seemed to have boundless time and energy for traveling. Yet is this a safe assumption to make? It is true that records of life histories and distribution for major pest species are well known in the states in which they are of important economic concern. However, what of biological data on those insects that are only occasional pests as well as the majority of species which offer no particular threat to man's endeavors? In many cases, life histories may be known if the insects are parasitoids and predators and thus of interest in biological control of pest species, but little is known of the life histories and geographical and seasonal distribution for the majority of species primarily because of the diversity of habitats and the sheer number of species present in any habitat.

A perusal of literature dealing with ecological studies of insects could also lead to a misconception that relatively large geographical areas need to be sampled to obtain significant data. For investigations dealing with insect distribution on an intra- or intercontinental basis this is true. In addition, early ecological studies involved with habitat preferences of species were often based on fairly intensive collecting in large portions of a state or large regions delineated by topography, climate or vegetation. More recent approaches use improved instrumentation in the forms of macro- and microclimate sensor-recorders so that extensive physical, chemical and biological data gathered for computer analysis allow the construction of a model of the community or ecosystem. For instance, the International Biological Program is attempting such a modeling approach for various biomes. What is left amateur or professional entomologist who is not able to sample large areas of a biome because of a lack of sufficient budget or time? If a lack of additional manpower hinders a worker from satisfactorily investigating an unusual or otherwise interesting geographical area because it is too large or too far away, is there an alternative which could yet produce a significant contribution? Could the enthusiastic insect collector, who may be an expert with particular taxa and has a collection representative of these species, produce information needed to understand ecological relationships that are not always apparent?

If only a very small area is available, one could follow the lead of Isely (1946) who decided that his large backyard was suitable for studying food and habitat preferences of Acrididae, and thus proceeded to extract a remarkable amount of data from a readily accessible area. I would like to describe my recent experiences in collecting only orthop-

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The NEWSLETTER of the Michigan Entomological Society is published four times yearly, with luck, at irregular intervals. Please send all notes, news, new insect records, research requests, season summaries, important dates for the Entomologists' Calendar, other items for the NEWSLETTER, membership inquiries, dues, etc. to the Executive Secretary, Michigan Entomological Society, Dept. of Entomology, Michigan State University, East Lansing, Michigan 48823.

The Executive Secretary's Page

1972-73 OFFICERS OF THE MICHIGAN ENTOMOLOGICAL SOCIETY

President ..... Dean G. Dillery
President-Elect ..... Richard Fleming
Executive Secretary ..... M. C. Nielsen

1973 DUES

Some members have still not sent in their 1973 dues. Please make every effort to pay your dues within a reasonable time after receiving your dues' notice. Remember, publications may be withheld for dues not paid during the calendar year at the discretion of the Executive Secretary. Some members continue to ignore notification of their change of address--hence lost or delayed publications!

MES ANNUAL MEETING

The 19th Annual Meeting of the Michigan Entomological Society will be held on 18-19 May at Michigan State Univ., East Lansing, Michigan. Plan NOW to attend!! Those planning to present a paper should notify Dr. Richard Fleming, Program Chairman, Biology Dept., Olivet College, Olivet, Michigan 49076, as soon as possible. A call for papers will be forwarded shortly to all members. Following the meeting, an evening of "blacklighting" will be conducted at the Rose Lake Wildlife Area, located a short distance from the campus. There will be tours to the Pesticide Research Center and the Entomology Museum, and a field trip to either Rose Lake or Dansville State Game Area (weather permitting). Don't procrastinate; MARK YOUR CALENDAR NOW! Let's make this meeting one of the best with your attendence!

NEWS OF MEMBERS

GORDON E. GUYER, chairman of the Michigan State Univ. Dept. of Entomology, has been elected president of the Entomological Society of America. He said the society is seeking to develop a pest management program that will have national and world wide application.

FRED W. STEHR, Dept. of Entomology, Michigan State Univ. is currently at the U.S. National Museum preparing for a revision of Peterson's Key to Immature Lepidoptera. He plans to have the background work completed by July 1973.

NEWS OF BRANCHES

DETROIT: The Fall meeting was held in Science Hall, MSU on November 14, 1972. Mr. H. Lewandowski of the Dept. of Biology, WSU, spoke on the taxonomic implications of foregut armature in the Orthopteroidea. Anyone interested in the activities of the Detroit branch is invited to contact M. Tyrkus, Dept. of Biology, Wayne State Univ., Detroit, Mich. 48202.

NOTICES

FOR SALE: Glass topped drawers, 19 3/4 X 19 3/4 in., in units of 15 drawers each. Two units presently available, $100.00 per unit. Also, bound volumes of scientific periodicals, including some entomological journals. $15.00 per volume, postpaid, list on request. Russell A. Rahn, 314 N. 5th St., Watertown, WI 53094.

ATTENTION: Would like to contact people interested in starting a worldwide Saturniidae club. Interest in all aspects of this family are welcomed. Please write if interested. Jim Tuttle, 227 Theadore, Monroe, MI 48161.

WANTED: Records of *Sphinx franckii* (Neum) for census of distribution in time and space. Please give date, locality, collector, number by sex, and present location of specimens. Bryant Mather, 213 Mt. Salus Dr., Clinton, MS 39056.

WANTED: Your collecting records for *Speyeria aphrodite* and its subspecies *alcestis*. If you are uncertain of the identification, send specimens and I will identify them. Am working on the life history and distribution of these butterflies. Dick Arnold, Dept. of Entomology, Mich. State Univ., East Lansing, MI 48823.

WANTED: Livestock or papered adults of Tuliptree Silkmoth, Rosy Maple Moth, and Oakworm Moths (*Anisota senatoria* and *virginiensis*). Also other Saturniids. Contact Russell L. Dunn, Box 468, Sedona, AZ 86336.

WANTED: Ichneumon-flies of America North of Mexico, 1959-1962, U.S. National Museum Bull. 216, Part 1, 2, 3. Will pay reasonable price. Contact Bob Averill, Dept. of Forestry, Mich. State Univ., East Lansing, Mich. 48823.

AMATEUR INSECT COLLECTING: A SCIENTIFIC CONTRIBUTION (continued from page 1)

teroids for two years in a small field to indicate that there is a wealth of data available depending on the objectives of investigator. My objective was to obtain data on chronological and geographical distribution of certain orthopteroids. I chose a 1.8-acre sandy field in central Michigan which was only a 10-minute drive from the university. The choice of habitat is vital in obtaining both maximum and reliable data. Regardless of the vegetational complexity of the collecting area, it is all too common to underestimate the insect diversity until one takes the time to look more closely at the cryptic activity underfoot. Our upland field was chosen because it had been abandoned as a pasture more than 10 years earlier and was now an interesting mosaic of floral associations that could be separated into seven noncontiguous plots which included an open, moss-grass association, a dense stand of grass-milkweed and a dense goldenrod-bergamot-fern grouping. A total of 58 plant species were identified in the field attesting to the latter's diversity. Another feature leading to the choice of field was its isolation from similar areas. A road, forest or shrubs surrounded 80% of the field, thereby reducing inward or outward dispersal of insects. I had not sampled this field previously but had noticed a large number of grasshoppers in August several years earlier which led to my considering the area for future investigations.

A student and I sampled the field both day and night once a week making 40 180°-net sweeps in each of the seven plots. One pit trap was also used per plot during one year and three per plot were used the next. One person could have swept, serviced the traps, identified the species and recorded the data by allocating 6 to 10 hours per week depending partly on one's familiarity with species identification. Our sampling was not intensive but it was continuous from early spring to late fall and relatively standardized recognizing the limitations of sweeping due to variables introduced by collectors, weather and insect behavior.

The diversity of insects encountered in the small field was shown well when considering only the orthopteroids. We recorded 31 species distributed in seven orthopteroid families. Although we were not collecting to establish new seasonal records, the early and late collecting provided unexpected results because adults of three species were collected earlier and eight species collected later than the records for Michigan listed by Cantrall (1968). The field is located in Isabella Co. which is not well represented in various large collections in the state perhaps because it does not offer unusual habitats that attract collectors. In our study 22 species were captured that were previously unrecorded from the county. Seasonal distribution was obtained for most species showing the overlap of populations during immature and adult stages as well as the time of peak population of immatures and adults for each species (Bland 1973; Bland and Swayze 1973a, b).

More data derived from concentrated study is needed to fill gaps in insect ecology. A trend toward gathering in-depth, precise ecological data with narrow parameters contrasts with earlier broad, all-encompassing studies which were relatively non-empirical. With suitable methods and feasible (= modest?) goals, the close study of insect groups in small, local habitats has much to offer. Amateur entomologists in particular can contribute data by supplementing their insect collections with a study of the life history and seasonal distributon of the local populations of a particular species that may be well represented in their collections. This information would be a valuable asset in the continuous building of data banks on insect biology.

LITERATURE CITED

Bland, R. G. 1973. New orthopteroid records in Michigan derived from sampling a small field. Great Lakes Entomologist 5: 109-110.

Bland, R. G. and D. D. Swayze. 1973a. Chronological and geographical distribution of orthopteroid populations in an abandoned Michigan pasture. I. Acrididae. Submitted to Environ. Entomol.

_____. 1973b. Chronological and geographical distribution of orthopteroid populations in an abandoned Michigan pasture. II. Gryllidae, Tettigoniidae and related families. Submitted to Environ. Entomol.

Cantrall, I. J. 1968. An annotated list of the Dermaptera, Dictyoptera, Phasmatoptera, and Orthoptera of Michigan. Mich. Entomol. 1: 299-346.

Isely, F. G. 1946. Differential feeding in relation to local distribution of grasshoppers. Ecol. 27: 128-138.

PUBLICATIONS OF MEMBERS

Hansen, Clark B. 1972. The Catocaline Moths of Minnesota and Neighboring Areas. Mid-Cont. Lepid. Ser. 5(63): 1-15.

Hardwick, D. F. 1972. The Life History of *Schinia intrabilis* (Noctuidae). J. Lepid. Soc. 26: 24-28, illus.

Hardwick, D. F. 1972. The Life History of *Schinia pallicincta* (Noctuidae). J. Lepid. Soc. 26: 29-33, illus.

(Continued on page 5)

Gypsy Moth in Michigan

During 1973, as a result of an extensive survey program, a Gypsy moth infestation was detected in Michigan for the third time. A total of 3,775 traps (baited with the pheromone disparlure to attract male moths) were placed throughout the lower peninsula of Michigan by the Michigan Depts. of Agriculture and Natural Resources and the USDA's Division of Animal, Plant Health Inspection Service. Moths were trapped in Bay, Mecosta and Isabella Counties but only the Isabella County location yielded egg masses. The Bay and Mecosta County catches probably resulted from itinerant adults brought in on vehicles and do not constitute infestations.

The Isabella County infestation consists of one heavily infested woodlot of some 30-40 acres in Freemont township. Egg mass surveys during December 1972 indicated no other major detectable infestations. On the basis of the survey, some 16 sections in Freemont township, 10 sections in Rolland township and in Montcalm County 4 sections of Richland township were placed under Gypsy moth quarantine regulations. It is planned that some 8-10,000 acres will be treated with Dylox or Sevin to control larvae during May when eggs hatch. Later during the summer an intensive male trapping survey will be conducted to document not only the effectiveness of the spray program but possible infestations outside of the known infested region.

ADULT FEMALE

There is little doubt that if and when the Gypsy moth becomes established in Michigan it will be a major pest problem. Preferred host plant species are several species of oak, aspen and birch. The insect has demonstrated it can sustain itself under our weather conditions. While it is impossible to trace the source of the present infestation, it is believed that a trailer from Groton, Connecticut, may have introduced the insect some 5 or 6 years ago. The number of recreational vehicles entering Michigan yearly from infested eastern states dictates that introductions will become more commonplace in the future. The natural westerly spread of the insect throughout New York and much of Pennsylvania means that Michigan will be infested eventually.

YOU CAN HELP. Gypsy moth is one of the most harmful pests in this country today, and survey entomologists in the Great Lakes Region want to know where it is so eradication or suppression procedures can be implemented. HELP us locate new outbreaks of this insect by searching out the egg masses or other stages of the insect. Egg masses or larvae (see photo below) should be sealed in a vial of alcohol; adults can be killed and sent in a box with cotton. Send suspect specimens to Dr. W. Wallner, c/o Dept. of Entomology, Michigan State University, East Lansing, Michigan 48823.

EGGS

Here is a brief description of the insects' habits. The Gypsy moth develops in four stages--egg, larva (caterpillar), pupa (cocoon), and moth (see photo). It has one generation a year and overwinters in egg masses attached to trees, stones, walls, logs, and other objects. Each Gypsy moth egg mass contains up to 1,000 eggs and is covered with buff of yellowish hairs. The velvety egg masses average about 1 1/2 inches long and about 3/4 inch wide.

Eggs begin hatching in late April or early May. The brownish, hairy caterpillar is easy to identify in later stages by the pairs of red and blue dots on its back. Mature caterpillars are from 1 1/2 to 2 1/2 inches long.

Natural spread occurs during the pest's larval stage. Caterpillars drop from tree tops on silken threads. During high winds these threads act as sails and the lightweight larvae may be blown over many miles.

LARVAE

Caterpillars enter the pupal "cocoon" stage late in June or early in July, emerging from their pupal cases in 10 to 14 days as moths. Males have dark brown forewings and a 1 1/2 inch wingspread. Female moths are white, with a wingspread of about 2 inches. The female moths do not fly.

FOREIGN PESTS COSTLY TO MICHIGAN AGRICULTURE

Each of Michigan's major field crops now has its own "foreign" guest. The cereal leaf beetle, *Oulema melanopus* (L.), appeared on small grains in 1962; the alfalfa weevil, *Hypera postica* (Gyllenhal), on alfalfa in 1966; and the western corn rootworm, *Diabrotica virgifera* LeConte, on corn in 1971. At last report, the cereal leaf beetle had penetrated into the Upper Peninsula of Michigan and the alfalfa weevil is threatening alfalfa in all of the Lower Peninsula. The 1972 survey showed the western corn rootworm present in nearly all counties south and west of Clinton County with reliable (but not confirmed by specimens) reports of their presence in Mason and Monroe Counties.

The cereal leaf beetle and alfalfa weevil have caused an additional 383,000 acres in the state to be sprayed each year with insecticides. The western corn rootworm will probably add another 120,000 to the 271,800 acres already being treated for the native northern corn rootworm, *D. longicornis* (Say), in Michigan. The losses, costs, and troubles caused by these pests are bad news to the farmer, and the increased use of even the non-persistant insecticides used in these ubiquitous crops is hardly good news to the public.

Varieties of small grains resistant to the cereal leaf beetle and a larval parasite, *Tetrastichus julis* Walker, show promise for subduing the beetle. Early cutting of the alfalfa and an adult parasite, *Bathyplectes anurus* (Thompson), also offer promise in suppressing the alfalfa weevil and its damage. There is a good chance that the use of insecticides for the control of these pests will become scattered and sporadic within the next few years.

No realistic alternatives to insecticides for rootworm control are anywhere in sight. The rootworms are pests "created" by the corn-after-corn monoculture that is forced by economics. Rotation of corn with any other crop would eliminate damage from the rootworms--and also make some of our farming operations (beef fattening, for example) poor investments.

Pending the arrival of some other new pest into the state, our need to apply insecticides to field crops should increase and then diminish over the next few years. The promise of non-chemical controls for the alfalfa weevil and cereal leaf beetle has developed from broad, coordinated programs on these insects. The challenge now is to derive an economically sound means of handling the corn rootworms.

----R. F. Ruppel, Dept. of Entomology, Michigan State University

DRY CLEANING BUTTERFLIES

The bodies of most Lepidoptera contain fat, either in the fat bodies and, in the case of females, also in the eggs. During storage and subsequent relaxation this fat can migrate onto the wings, resulting in dull or stained specimens. In some cases the fat can be so abundant that the wings of relaxed specimens cannot be separated. I recently has this experience with a series *Eunica tatila*. Rather than discard these rather uncommon specimens I put them directly into a bath of diethyl ether, a well-known fat solvent. I chose this over other solvents since it was compatible with the water in the freshly relaxed specimens. Also it dries completely clean and dry, while the bodies and antennae remained soft and manageable. The specimens spread and dried in the usual way, and no further fat oozed from the bodies.

Following this success, I tried the method on a further twenty speimens representing seven families. These were all grease-stained specimens mounted months or years ago. I simply dunked them, pin, label, and all, in the ether for about 30 seconds, then air-dried them. In every case the grease disappeared and the specimen became clean and fresh-looking.

As far as I have been able to determine, none of the pigments in the Lepidoptera are ether-soluble, and colours of treated specimens seem to be as bright as those of normal individuals. However, it would be wise to label any washed specimen to see if any change becomes visible over a long period of time.

Dry specimens can be degreased in various solvents, such as naptha, carbon tetrachloride or any of the other chlorinated hydrocarbon solvents. Petroleum ether and trichlorethane are especially suitable. Care should be exercised in the use of ether, naptha, etc., since they are extremely inflammable.

by Dr. A. G. Edmund (from Newsletter of Toronto Entomologists' Association, March, 1972)

Publication of members (cont. from p. 3)

Irwin, Roderick R. 1972. Further Notes on W. H. Edwards Specimens in Illinois Museum Collections. J. Lepid. Soc. 26: 198-199.

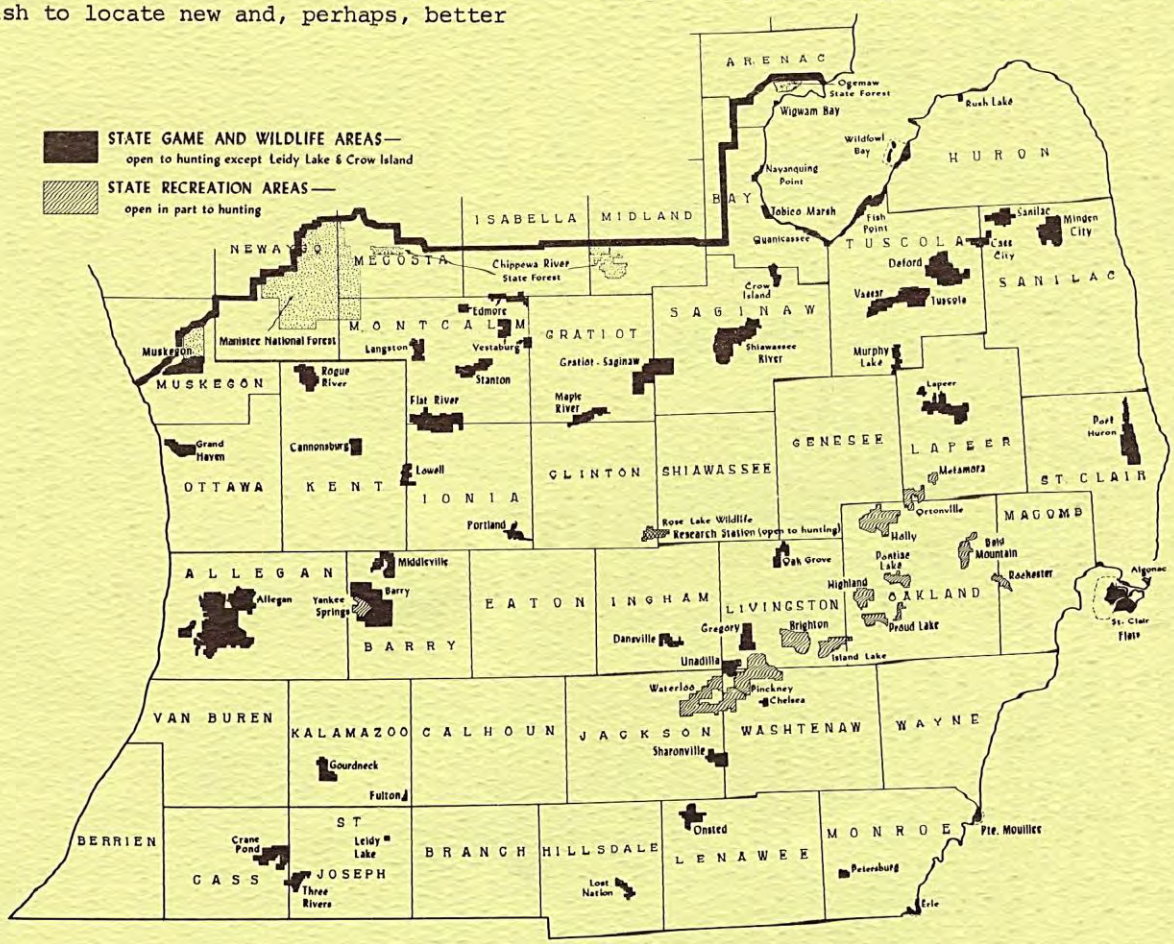
Masters, John M. 1972. A New Subspecies of *Lycaeides argyrognomon* (Lycaenidae) from the Eastern Canadian Forest Zone. J. Lepid. Soc. 26: 150-154, illus.

Masters, John and Roger Kuehn. 1972. Wisconsin Butterflies. Mid-Cont. Lepid. Ser. 4(59): 1-12.

Shull, Ernest M. and F. Sidney Badger. Annotated List of the Butterflies of Indiana. 1971. J. Lepid. Soc. 26: 13-24.

MICHIGAN COLLECTING AREAS

For those southern Michiganders who are interested in getting away for a few hours with your net or UV, and not having the time to drive great distances to the "far north", why not try one of many state-owned game or recreation areas scattered over southern Michigan (see map). All of these areas are open to the public and can be used by members who wish to locate new and, perhaps, better collecting spots. You will find an interesting array of habitats and probably locate colonies of unique insects that will not be destroyed by the encroaching urban sprawl! For details on any one project area, contact the nearest Dept. of Natural Resources District Office, or write to DNR Publications, Commerce Bldg., Lansing, Mich. 48926.



THE MOTHS OF AMERICA NORTH OF MEXICO

Fascicles 13.1a and 13.1b, dealing with the Pyralidae (part), were recently mailed to all subscribers. The following is a summary of future publication dates:

1. March 1973: Fascicle 20.1, Bombycoidea (Except Saturniidae), by J. G. Franclemont
2. June 1973: Fascicle 13.1c, Pyralidae (part; concluding section), by Munroe
3. September 1973: Fascicle 6.2, Gelechioidea, by R. W. Hodges
4. December 1973: Fascicle 22.2, Lymantriidae, by D. C. Ferguson.

In preparation are those fascicles on the Notodontidae; the Cosmopterigidae and the Walshiidae of the Gelechioidea (by R. W. Hodges); and the Aegeriidae (by D. R. Duckworth and T. Eichlin). This comprehensive, mammoth undertaking will be the FUNDAMENTAL REFERENCE WORK for years to come!

For information on subscription, or individual fascicle prices, write to: Entomological Reprint Specialists, P. O. Box 77971, Dockweiler Station, Los Angeles, CA 90007.

U.S. GOVERNMENT PUBLICATIONS

Order by number and title from superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Remit by check, money order, or Superintendent of Document Coupons (available in 5¢ denomination, in any quantity).

7A. INSECTS AND RELATED PESTS OF HOUSE PLANTS, HOW TO CONTROL THEM. Tells how to recognize and control the most common insects and related pests that attack

15P. CONTROLLING MOSQUITOES IN YOUR HOME AND ON YOUR PREMISES. Mosquitoes can be a vexing and sometimes a serious problem. This publication discusses the mosquito problem, describes breeding habits and the development of mosquitoes, gives detailed instructions for their control both indoors and outdoors, and tells what precautions should be taken when using insecticides. Rev. 1972. 8 p., il. A1.77:84/6 S/N0100-2429 10¢

37T. CONTROLLING THE BROWN RECLUSE SPIDER. Describes the brown recluse spider, where it is found, effects of its bite, and effective control methods. 1972. 8 p., il. A1.35:556 S/N0100-1556 15¢

9D. DDT USED IN FARM PRODUCTION. This report shows recent use of DDT in U.S. farm production & indicates trends in U.S. production of DDT & its overall use. Rev. 1971. 7 p., il. A93.28:158/2/corr. S/N 0119-0196 15¢

22Y. CONTROLLING WOOD-DESTROYING BEETLES IN BUILDINGS AND FURNITURE. Describes wood-destroying beetles and discusses their characteristics; how they do their damage; precautions to prevent their attack; and suggested treatment and control. 1972. 8 p., il. A1.35:558 S/N 0100-2482 10¢

77H. SILVERFISH AND FIREBRATS, HOW TO CONTROL THEM. Provides a brief description of these insects & their habits, & places where they may be found. This leaflet also discusses the physical development of these pests & explains the uses of dusts & sprays for their control. Rev. 1971. 6 p., il. A1.35:412/8 S/N 0100-1494 10¢

65A. NO. 6 AQUATIC DRYOPOID BEETLES (COLEOPTERA) OF THE UNITED STATES. 1972. 82 p., il. EP1.16:18050 ELD 04/72/no. 6 S/N 5501-0370 Cloth, $2.50

66A. NO. 7 FRESHWATER ISOPODS (ASELLIDAE) OF NORTH AMERICA. 1972. 45 p., il. EP1.16:18050 ELD 05/72/no. 7 S/N 5501-0390 Cloth, $2.50

67A. NO. 8 FRESHWATER LEECHES (ANNELIDA: HIRUDINEA) OF NORTH AMERICA. 1972. 53 p., il. EP1.16:18050 ELD 05/72/no. 8 S/N 5501-0391 Cloth, $2.50

2H. REARING THE GREATER WAX MOTH. This science study aid has been designed primarily to study complete metamorphosis as shown by the life cycle of the greater wax moth. Gives easy instructions for rearing the greater wax moth in the classroom. 1970. 6 p., il. A1.104:3 S/N 0100-1066 10¢

4H. HOUSE FLY ATTRACTANTS AND ARRESTANTS: SCREENING OF CHEMICALS POSSESSING CYANIDE, THIOCYANATE, OR ISOTHIOCYANATE RADICALS. Describes the methods used to screen the chemicals & gives the results of the tests. 1971. 26 p., il. A1.76:403 S/N 0100-1260 25¢

6H. WIREWORMS ON IRRIGATED LANDS IN THE WEST: HOW TO CONTROL THEM. Describes wireworms; tells how to recognize & detect them in the soil; & discusses their habits & how they damage crops. The cultural methods & chemicals used to control them are also described. Rev. 1971. 13 p., il. A1.9: 2220/2 S/N 0100-1431 15¢

4G. BEEKEEPING IN THE UNITED STATES. This handbook on beekeeping is for the established beekeeper, the extension specialist, teachers, & those who desire to know more about bees. It includes information about the colony & its activity as affected by external environment or beekeeper manipulations, the makeup of the beehive, bee behavior, honey production, honey plants, use of bees in pollinating crops, & bee diseases. Rev. 1971. 147 p., il. A1.76: 335/2 S/N 0100-0728 $1.50

53F. UNIVERSITY CURRICULA IN THE MARINE SCIENCES AND RELATED FIELDS, Academic Years 1971-72 and 1972-73. This report contains information on a wide diversity of curricula offered at 134 academic institutions throughout the country. It is published by the Oceanographer of the Navy in the hope that it will be of assistance to students in planning careers in the marine sciences. 1971. 214 p. D218.9:43 S/N 0842-0053 $1.75

In addition to the mail order service provided by the Office of the Superintendent of Documents, Government Printing Office, there are also 13 retail bookstores outside of Washington, D.C., each of which have in stock approximately 1,000 of the most popular titles. Three of these are: Canton Bookstore, Federal Office Bldg., 201 Cleveland Ave. S.W., Canton, Ohio 44702, telephone: Area code 216-2445-8971; Chicago Bookstore, Room 1463--14th Floor, Everett McKinley Dirksen Bldg., 219 S. Dearborn St., Chicago, Illinois 60604, telephone: area code 312-353-5133; and Detroit Bookstore, Room 229, Federal Bldg., 231 W. Lafayette Blvd., Detroit, Michigan 48226, telephone: area code 313-226-7816.

CLIMATE BOOK AVAILABLE

A comprehensive publication dealing with the climate of the Great Lakes area has been made available to the public by Environment Canada.

The Climate of the Great Lakes Basin uses over 50 maps plus diagrams and tables to describe the weather conditions over this unique international area. Five hundred weather stations in Canada and the United States were used to determine the climatic normals, and the book includes discussion of ten meteorological elements.

Designed to meet the needs of professional planners and the general public, this book stresses the effect of the Great Lakes in modifying the land climate. Authors are two scientists of the Atmospheric Environment Service, D. W. Phillips and J. A. W. McCulloch. The book can be ordered from Information Canada, Ottawa, Ontario, by ordering catalogue number EN47-7/20 and by enclosing a check or money order payable to Receiver-General of Canada. The 105-page volume is $1.50 (Canadian).

ENTOMOLOGY INSTRUCTIONAL KIT

The Entomological Society of America and Brigham Young University jointly are producing an Instructional Kit suitable for use in a course in Introductory Entomology. The Kit includes 27 cassette lectures prepared by renowned entomologists with demonstrated research experience and expertise; a manual of charts, graphs, and other essentials; color transparencies; and laboratory exercises. Thirty manuals are provided as a part of each Kit. The tentative cost of each Kit is $300 to $400. They are expected to be ready for mailing by September 1973. If interested write to V. J. Tipton, Chmm., ESA Committee on Education, Box 7402, Univ. Station, Provo, Utah 84601.

MICHIGAN ENTOMOLOGICAL SOCIETY

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