

MINUTES OF THE SEVENTH ANNUAL MEETING OF THE
LEPIDOPTERISTS' SOCIETY

The seventh Annual Meeting of the Lepidopterists' Society was held in Room 426, American Museum of Natural History, New York City, New York, on 27 December 1956.

At 10:30 A.M., following registration, President T. N. FREEMAN opened the meeting. He thanked the authorities of the American Museum of Natural History for the use of the facilities, with special thanks to Dr. FREDERICK H. RINDGE, curator of the Lepidoptera collections. He then introduced Dr. C. L. REMINGTON of Yale University who acted as Moderator for the first round table on "Hand Pairing and Rearing Methods." M. W. OSBORNE, of Rahway, N. J., opened with a discussion of cage-pairing and mass-rearing techniques, based especially on his experience with Saturniid moths. He used a cage 4 feet cubed, in which the food-plant was placed on shelves. He found that the important limitation to successful rearing was the presence of "polyhedral" and "wilt" diseases. This opened a discussion on the sterilization of cages, in which Mr. OSBORNE was joined by L. P. GREY, C. L. REMINGTON, T. N. FREEMAN, S. A. AE, and A. B. KLOTS. The consensus of opinion was that elimination of the virus is impossible (it is even egg-borne), and that control is difficult. It was pointed out that the virus can be transmitted after three years. It was suggested that food plants be fed a penicillin solution. This would control the bacterial disease.

In connection with the disease problem, it was noted that spraying water on the pupa is an invitation to trouble. A special note was made that this even included large pupæ like the Sphingidæ. Too much moisture means pupal mortality. Dr. REMINGTON pointed out the importance of chilling dormant pupæ, to break the pupal diapause. Dr. KLOTS called attention to his method of using live steam from a pressure cooker for the sterilization of cages.

Dr. KLOTS then called attention to an experiment performed at the turn of the century. Cynthia and Promethea moths were crossed both ways. When the male Promethea was crossed with the female Cynthia, all the progeny were Cynthia moths. When the male Cynthia was crossed with the female Promethea, the progeny were hybrid phenotypes.

Dr. REMINGTON then began the discussion of hand-pairing. Hand-pairing effectively short-circuits the courtship mechanism, which was probably evolved to avoid hybridization in nature. It appears that the length of time of copulation is roughly proportioned to the size of the lepidopteran. The ease of hand-pairing is in proportion to the size of the male genitalia. In *Papilio* and *Pieris* it is easy. In *Colias* and many sphingids it is very difficult. Dr. A. B. KLOTS reported that he had experimented with hand-pairing in *Crambus*. In the discussion which followed, Dr. REMINGTON made some interesting points. It appears that the condition of the live specimen is no indication of its age. After emergence, males cannot be hand-paired for a couple of hours; the male should be from 2 to 6 days of age. Females, however, are best paired within the first few hours. The males can be paired again (re-paired). The females can be paired again (re-paired). This last fact comes as a surprise. He has re-paired single females as many as three times. One male of known genetic type can be mated with several females. Dr. REMINGTON described further the results of his experiments in repeated pairing of *Papilio polyxenes*, beginning with a female of the yellow-banded *machaon-brucei* type. The offspring are all of the black *polyxenes* type, but if the female is re-paired with a yellow male, all the offspring from eggs laid after the new pairing are yellow-banded. He pointed out that wild, fertile females of *Papilio* can be re-paired. Mr. N. SHOUMATOFF asked about the role of the sphragis in *Parnassius*. Dr. REMINGTON replied that he suspected that the function of the sphragis was probably not merely what it was generally supposed to be.

R. W. PEASE, JR., of Yale University, then discussed methods of getting eggs in captivity. There are essentially four methods for obtaining eggs from Rhopalocera. First is the paper-bag technique. This is especially effective in satyrids and the genus *Parnassius*. The second method is to place a female in a closed "ice-box" plastic dish in

indirect sunlight. Mr. PEASE found this method very effective in keeping the plants fresh and the females active. The third method is to place females in an open cage, with the food-plant within a vial or jar of water. This latter method was highly successful with *Strymon* and those Hesperiid species such as *Erynnis* which are highly food-plant specific. The fourth method is the use of the lantern chimney surrounding the food-plant which is set in a pot of sand. This worked especially well with *Papilio* of the *machaon* group and with members of the genus *Limenitis*. The *Papilio* of the *glaucus* group laid eggs best under a sunlit bell-jar. All of these methods failed in certain species. It was emphasized that certain caution must be taken in any of the methods: (1) remove and replace the food plant every day; (2) use no *direct* sunlight in most situations; (3) guard against the introduction of mites, spiders, and parasites; (4) the use of artificial light should be intermittent rather than continuous; (5) oviposition conditions vary in the different species; (6) the females should be fed honey-and-water at least once each day, but under no circumstances should the abdomen come in contact with this solution. In the discussion which followed, Dr. REMINGTON said that warmth helps hand-pairing. A chilled specimen should be brought into a warm room to simplify hand-pairing. Dr. KLOTS substantiated these remarks by calling attention to alternate periods of coolness and warmth, darkness and light, which were utilized at Churchill, Manitoba, to induce oviposition. Mr. OSBORNE discussed hand-pairing with dissociated male abdomens. Abdomens in this state are very matable, but the resultant fertility is low. Rubber cement is used to cover the open end of the abdomen. This method worked well with moths. It did not work for him with butterflies. Dr. FREEMAN then adjourned the morning session for lunch at 12:25 P.M.

The afternoon session was opened at 1:45 by Mr. CYRIL F. DOS PASSOS, of Mendham, N. J., and the American Museum, leading the round table on the subject of "Infra-specific Nomenclature." Prior to 1948 there were no rules on the subject of infrasubspecific nomenclature. The Rules covered only species and subspecies. The 1948 International Congress of Zoology laid down a series of rules for the lower categories. They were to be held distinct from the higher categories. The names in infrasubspecific status could be elevated or degraded. They were to date from the time of their elevation. The Law of Homonymy was not to apply to infrasubspecific names. In 1953 at Copenhagen an effort was made to repeal these rules. This failed. A new effort may be made in 1958 at London.

PAUL R. EHRLICH'S contribution on the subject was read by Dr. RINDGE, and is being published in this issue of the *News*. Dr. FREEMAN stated that it is easy to state a principle and then find an example to fit it. A discussion arose on "objective" and "subjective" taxonomy. Mr. SHOUMATOFF inquired as to what was "objective." Dr. KLOTS clarified the situation by stating that objective material is the material studied. The delimitation of the population is based on the set of material. Any other conclusion is subjective. It is the opinion of Dr. KLOTS that much of the so-called "subjective" taxonomy is personal bickering.

L. PAUL GREY stated in opening his portion of the discussion that a species was "a geographical aggregation which displays certain cleavage lines and in which there is no suspicion of overlap." He reiterated very strongly this "absence of overlap" concept. The systematist, according to Mr. GREY, must not worry about evolutionary values. The taxonomist's job is to set up the parcels. The insides belong to the geneticist and the evolutionist. Taxonomy is strictly a run-through of the material. An enlargement of the species concepts gets over the overlaps. Systematists should have no concern with varieties. Mr. GREY pleaded for a return to binomial nomenclature. In Argynnids you can get around without subspecies.

NICHOLAS W. GILLHAM, of Camp Detrick, Maryland, then read a controversial paper in which he condemned the use of trinomials. The essence of his position is that separate characters in a species vary geographically independent of each other and that attempts to delimit races and clines, as though the characters vary together, obscure the really significant geographic trends which occur in each separate character. The detailed evidence and discussion he has published in *Systematic Zoology*.

At 3:15 P.M. Dr. KLOTS, of the American Museum, took over the chair for the presentation of the submitted papers.

The first paper was by JANE V. Z. BROWER of Yale University on "Experimental Studies of Mimicry in North American Butterflies." Mrs. BROWER worked on: (1) the Monarch — Viceroy pair; (2) the *philenor-troilus-polyxenes-black glaucus* ring; and (3) the *Danaus gilippus berenice* — *Limenitis archippus floridensis* complex. Three questions which must be answered in a mimicry experiment include: (1) Will model butterflies be eaten by birds? (2) Will mimicking butterflies be eaten by birds? (3) Will birds eat the mimics after prior experience with the models? Her experiments were carried out at the Archbold Biological Station in Highlands County, Florida. The results are summarized in a 1957 paper published in *Nature* (vol. 180: p. 444) and are given in detail in a forthcoming series in *Evolution*. They show conclusively: (1) that under the conditions of her experiment the models (Monarch, *Battus philenor*, and *D. g. berenice*) are generally rejected by the birds; (2) that the mimicking species are consistently eaten by the birds until (3) the birds have experienced a model, after which they generally reject the mimics.

S. ALBERT AE then presented his paper on "Growth Rates and Hibernation in *Colias* Larvæ." Growth rates were compared in five species of *Colias* and in interspecific hybrids. *C. philodice* had the fastest growth rate, *C. scudderi* the slowest. The hybrid growth rates were slower than the normals. Females have a much slower growth rate than males. The full results are being published separately.

R. W. PEASE, JR., then spoke on "Studies of First Instar Larvæ." The paper was concerned entirely with the Saturniidæ and is being published in full. Mr. PEASE explained a setal map and made an important distinction between primary and secondary setæ. The setæ were described as to their constancy and taxonomic value. The setæ and other characters of the first instar larvæ confirm most of the taxonomic arrangement now in use and can be used to separate at least the genera.

The next paper, by A. E. BROWER, of the Maine State Entomological Laboratory, was on "Some Changes in the Range of Lepidoptera Species." Dr. BROWER gave the results of 26 seasons of field work. There are three basic reasons for a change in range: (1) migration; (2) long-time population changes; and (3) unusual climatic conditions. Some populations are highly local. A collector can collect for years and not get an insect due to population fluctuation and extreme localness. There are a few examples where the range has really changed. Conspicuous insects are now there where the early collectors could not have missed them.

Dr. KLOTS then read his paper "Some Notes on Life Histories of Lepidoptera." He illustrated the "Pepper and Salt" Skipper (*Amblyscirtes hegon*), which corrects SCUDDER'S erroneous figure. Dr. KLOTS suggested two ways of starting life-history work: get the female to lay an egg, or get the larva on the food-plant. Dr. KLOTS made a strong plea for life-history work in taxonomy.

The last of the submitted papers was by LINCOLN P. BROWER, of Yale University, on "Interspecific Ecology of the Sympatric Western Tiger Swallowtails." Mr. BROWER spent several summers in Colorado and Utah on this work. In this area there are three swallowtails in the *glaucus* group with similar color patterns, *P. multicaudatus*, *P. rutulus*, and *P. eurymedon*. These are all sympatric. The site of the majority of the experiments was Left Hand Canyon in Boulder County, Colorado. Several mechanisms were found which minimize natural interspecific hybridization, including: (1) seasonal differences at any one locality; (2) some altitudinal specialization; (3) strong barriers to mating, although interspecific courtship occurs. The paper is being published in full separately.

At 4:40 Mr. BROWER'S movie, "Courtship in *Papilio*," was shown, followed by one on "Migration Studies in *Ascia monuste*," by Dr. ERIK T. NIELSEN of Vero Beach, Florida.

The business meeting was opened by Dr. FREEMAN with a report on the Lepidopterists' Society dinner held last August in conjunction with the International Congress of Entomology. Mr. S. A. HESSEL presented the Treasurer's report, accompanied by a comparative analysis of the receipts. There has been a definite but slow improvement in the finances of the Society during the past several years.

Dr. REMINGTON gave the Editor's report. The price for printing the *News* has been increased 20% by the printer, and quotations have been asked from other printers to permit our continuing the *News* at its present size.

Mr. HESSEL called for continuing contributions to sustain the Society. Dr. REMINGTON suggested approaching the National Science Foundation for a grant to sustain the abstracts. The next annual meeting will be held in Washington in December, 1957. The U. S. National Museum will be the host. Dr. REMINGTON, on behalf of the Society, thanked the Program Chairman, Mr. HESSEL, and the Local Arrangements Chairman, Mrs. ALICE L. HOPF, for their effective work in spite of a short time in which to organize the meeting. The meeting was adjourned to the Society Banquet.

The meeting was resumed at 7:30 P.M. President T. N. FREEMAN gave the Presidential Address on problems of taxonomic study in the genus *Recurvaria*, which is being published in this issue of the *News*.

The final session of the day was a round table on "Lights and Light Trapping," moderated by Dr. ASHER E. TREAT, of the City College of New York.

Many different types of light traps were sketched for the information of the members. The chief interest was in the use of the "black" lights, which produce ultraviolet rather than light visible to humans. JOSEPH MULLER, of Lebanon, N. J., described an outfit of two 40-watt "black" neon tubes four feet above ground on a white wall. Mr. MULLER leaves the light up to 3:00 A.M. Best results are obtained on humid dark nights.

The use of gasoline lanterns and black lights with traps in Maine was described by A. E. BROWER. Dr. BROWER finds that a 14-watt black light brings in more moths than a 250-watt incandescent light. The lamp and trap may capture about 3,000 moths a night.

L. J. SANFORD, of New York, described an effective black light, the 15-watt G.E. Blacklight 360. This produces the peak wave length for insects. Mr. SANFORD used it in controlled tests and was very effective. It is most effective on white-washed structures.

H. A. DENMARK, of the Florida State Plant Board, who is working with insect surveys in Florida, used many types of light traps. Among others he used mercury vapor lamps, 15-watt "black" light, Germicidal lamps, Germicidal lamps with shields, and even a unit operating from a cigarette lighter. Dr. DENMARK found the 15-watt "black" lamp the best. The other lamps do not compare in efficiency. Insects are marked with radio-active isotopes to trace migration from place to place.

Dr. FREEMAN then described his experience with a Canadian light trap which still utilizes the Coleman lantern.

The meeting was adjourned at 10:00 P.M.

Respectfully submitted,

L. S. MARKS

Secretary *pro tempore*