

The Lepidopterists' News

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THE FIELD SEASON SUMMARY OF NORTH AMERICAN LEPIDOPTERA FOR 1949

The summary for the 1949 season is the most interesting compiled thus far, for several reasons. First, this was a year of great migrations. Second, the effects from the severe blizzards of the past winter could be examined to some degree. Third, an unparalleled summer drought in the northeastern region permitted an analysis of the early results of such a climatic condition. Finally, the reports prepared by individuals in the field totaled many more than ever before; 77 such reports, added to the observations of the 9 Area coordinators, give a significantly extensive coverage of North American field conditions. The progression of reports for the three years was: 1947 - 49(+5); 1948 - 54(+8); 1949 - 77(+9). More important than the improved numbers this year is the frequent presence of comparisons with other seasons.

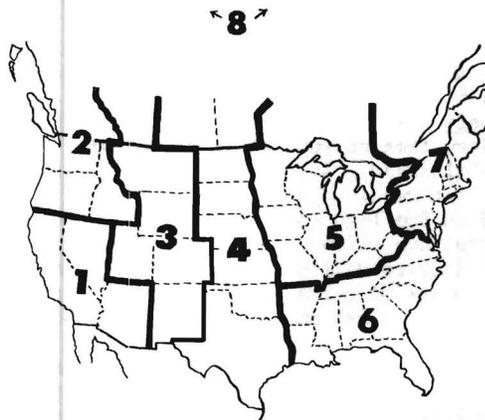
1. MIGRATIONS

One of the largest-scale migrations of Vanessa cardui in the memory of living collectors characterized 1949. Sugden, Woodbury, and Gillette (1947) reported 1930, 1931, 1935, 1941, and 1945 as years of migration in Utah. Williams (1930) showed the early years of tremendous flights to have been 1865 and 1884 in the East and 1884, 1901, 1914, and 1924 in the West. If a periodicity exists, it is not readily seen in these data. However, there has certainly never before been reporting as extensive as that in the following summaries, and this accurate gauge may begin to show some form when a few more of these annual summaries have appeared. In 1949 great flights of V. cardui were seen in California, Utah, Colorado, Ontario, and northern Quebec. Very unusual abundance but no obvious migrations were reported for New Mexico, Washington, British Columbia, Saskatchewan, Missouri, Ohio, Connecticut, Massachusetts, New Hampshire, Maine, Quebec, and Newfoundland. Only in the southeastern States was there no great increase in numbers. A particularly remarkable phenomenon was the heavy southward flight of V. cardui in southern Ontario, reported by Henson.

This was a year of great abundance for Celerio lineata in California, and rather large numbers appeared in many western localities. Phlegethontius sextus in Illinois and P. 5-maculatus in Quebec were far more numerous than usual. Large migrating flights of Danaus plexippus were seen in Illinois, Michigan, Maryland, and Virginia, and of Phoebis sennae in Maryland and Alabama. This year no migratory activity was reported for Libytheana bachmanii, Nymphalis californica, or Neophasia menapia.

2. EXTREME WEATHER

Neither the blizzards which raged over the Northwest, the Great Basin, and the Great Plains last winter nor the record-breaking drought which worried the Northeast had any very noticeable effects on the Lepidoptera. The few allusions to deleterious results of these weather events seem to the writer to indicate involuntary attempts to see effects, merely because one would expect them. Possibly some definite results of the drought in the East will be apparent during the 1950 season.



Map of Season Summary Zones

The 1949 season in the Southwest was apparently poor; however, the reporting was so scanty (weakest response in the three years) that the situation is obscure except for the southern California coast and the Santa Rita Mts. All other Areas had their best response this year and all reported rather average conditions. The coverage for the Central and Northeast was excellent, and for the southern part of the Rocky Mts. it was very good. States entirely absent this year were Idaho, Montana, the Dakotas, Nebraska, Iowa, Arkansas, Louisiana, Mississippi, Tennessee, West Virginia, Delaware, and Rhode Island. Reports from Canada were few but came from every Province (except P.E.I.).

C.L. Remington

by B.H. Weber, Burbank, California
and Lloyd M. Martin, Los Angeles, California

CALIFORNIA

The 1949 year was another of our unseasonal ones in southern California. In the late fall of 1948 there were early rains followed by a hard freeze, as low as 19° F. in the San Fernando Valley. Then, of all things, SNOW from the Pacific Ocean east to the desert. All elevations above 5,000 feet had snow until April. This led us to believe that a good spring season was due. However, on the desert a drying wind developed and this, combined with a lack of the usual spring rains, ruined the spring collecting in the coastal areas from Santa Ana in the south to Santa Barbara in the north and from Santa Monica in the west to the Mojave in the east. All the best collecting was done in the outlying areas. The summer collecting was generally poor. The season was delayed from one to three weeks in the high elevations and from no lag to one week in the low areas. This was one year when you had to be in the exact area at a specific time to get good collecting. This required weekly excursions and diligent searching; the butterflies were out in good numbers when one found them, but the finding was the hard part.

SAN DIEGO REGION. Thorne's report for this area is so thorough that it is given here almost unmodified. In spite of an unusually cold winter, the 1949 season was not much later than normal. Euphydryas editha was abundant by March 10, which corresponds with previous peak records from March 9 to 18. In exceptional years it flies in February. Philotes sonorensis flew in March, somewhat later than normal. Worn females were still on the wing March 30 in coastal areas. E. chalcidona appeared on April 10, about normal. Speyeria coronis males were taken June 19 in the Lagunas, about average. Normal rainfall more than offset the effects of cold and most nymphalids were well above average in abundance. Sample counts of larvae on Plantago in a good colony of E. editha on February 16 at Otay showed 28 and 29 on two measured square yards. This would represent a population as high as 140,000 larvae per acre, but, of course, the caterpillars were not continuous over such an area. Over 1000 eggs of Euphydryas chalcidona (very conservative estimate) were taken from a single Scrophularia californica plant on May 22. Larvae of Chlosyne californica were present by the hundreds on June 15. Melitaea leanira was the most abundant I have ever seen it here. They appeared May 7, then again June 18, indicating a double brood. During the emergence period of Speyeria callippe, we had 0.80 inches of rain which came as a drizzle for a whole week. This had no effect on the emergence. Nathalis iole, relatively rare here, was seen from one end of the county to the other and was numerous on June 15. Lycaenids were below normal, especially the Theclini, although Tharsalea hermes was as abundant as it was in the early 1930s. A single egg of this species hatched on March 16 under field conditions; mature larvae were found May 24. Phoebis sennae was the only species adversely affected by the cold winter. Agraulis vanillae was still on the wing December 6.

Briefly summarized, the winter was unusually cold but emergences were delayed only a few days.

There were practically no adverse effects from temperatures below freezing. Normal rainfall encouraged most Nymphalidae and Papilionoidea, but Lycaenidae and Hesperidae were below normal.

MOJAVE, COLORADO, AND BORREGO DESERT REGION. In general these outlying areas were above normal due to the heavy snowfall and rain early in the season, in the vicinity of Palm Springs and Twenty-Nine Palms. Thorne wrote: "Due to unusual rains in the desert, one of the best wild flower displays in years occurred. Vanessa cardui and Celerio lineata larvae appeared in immense numbers and cardui adults to the extent of 2 or 3 thousand were seen on one patch of damp sand at Little Borrego on April 12. This was not a migration, since they were breeding there. Later on, these may have migrated, since every shady spot that afternoon had 20 or 30 Painted Ladies and pressure of population must have been terrific." Near Palmdale and Little Rock, the Mojave suffered from the dry winds and was almost sterile by collecting standards. In early April Parker found Apodemia mormo, Callophrys dumetorum, and Vanessa cardui abundant, but the many other usual species were far below normal. Whitman took Chlosyne lacinia in the Borrego and Friday took numbers of Melitaea chara in the Palm Springs area in March. All over the desert areas Vanessa cardui were swarming. Nathalis iole and Eurema nicippe were very common. Weber took great numbers of Anthocharis cethura, Pieris sisymbrii, and Papilio rudkini in the Twenty-Nine Palms area in mid-March. A. cethura was common in the Providence Mountains just north of Essex near the Nevada line, as was rudkini in mid-April, three weeks later than usual. Euchloe creusa was scarce in comparison with 1948. Evans and Parker found Philotes sonorensis much more abundant at Azusa than in 1948. Miller noted incredible numbers of Golias eurymede near Blyth September 18.

SOUTH-CENTRAL COASTAL REGION. May and early June were cloudy and rainy in the Santa Barbara to Santa Cruz areas, but the author found two new colonies of Speyeria egleis near King City; Zerene eurymede was common here at that time. A few of the rare Papilio indra pergamus were taken in the Banning area in late June and in May on the Mt. Wilson road, where they were feeding on roadside thistle. Parker reported Euphydryas chalcidona, Strymon saepium, Plebeius acmon, Papilio rutulus, and P. eurymede extremely numerous in the Malibu Hills June 5; at the same time he found Tharsalea arota, Limnitis bredowii, Speyeria callippe, Melitaea leanira, M. gabbii, Phyciodes mylitta, and Anthocharis sara numerous as usual. In Los Angeles S. saepium, S. adenostomatis, S. melinus, A. mormo, Lycaenopsis pseudargiolus, and Ochlodes nemorum were common in June. On the Ridge Route T. arota, P. acmon, P. melissa, Minois silvestris, S. callippe, and S. coronis were numerous. But at 7000', in the San Bernardino Mts., August 10, butterflies were below average numbers, only Zerene eurymede appearing in fair abundance.

No reports were received from the central valleys, the San Francisco region, the High Sierras, or northern California.

FIELD SEASON SUMMARY 1. SOUTHWEST - cont.

NEVADA

Speyeria coronis (all ♂♂) was just emerging on Mt. Charleston on July 4. Papilio rutulus was common, as were Plebeius icarioides and Coenonympha ochracea. Limenitis weidemeyerii nevadae was in much better condition than at the same time in 1948 indicating that they were slightly later this year.

ARIZONA

The early July rains in southern Arizona brought excellent results for the collectors from southern California who ventured into the old collecting territory of several early entomologists.

On July 2 the Prestons and Weber found the Flagstaff area very wet; there was good collecting in Oak Canyon between the showers. Speyeria atlantis was rare at this time, although the conditions indicated its season was ending. Minois alope was common in an apple orchard. The rainy season was three weeks early this year and started June 26.

The White Mountains were almost duds this year. Not a Speyeria was seen July 6, but Coenonympha ochracea and Colias alexandra were common at this time.

Both butterflies and moths were out in numbers by July 30. Kricogonia lyside was very plentiful, feeding upon Mesquite blossoms from Covered Wells to the Baboquavari Mts. In Elkhorn Ranch Canyon on the east side of the Baboquavaris, Papilio cressphontes was seen in numbers, as were P. philenor, Eurema mexicana, E. boisduvaliana, Danaus berenice, Asterocampa celtis, A. leilia, A. clyton, Apyrothrix axes, and Antigonus pulverulenta. One ♀ Papilio lycophron pallas was caught, the second record of this species in the United States (Freeman recorded one from Brownsville, Texas). Three ♂♂ were seen but were impossible to get; they resemble philenor in flight and were flying very high.

From August 13 to 28, in Madera Canyon, Santa Rita Mts., the moths and butterflies were out in

good numbers. Reid took a Megathymus ursus and a Xylophanes falco along with many other rare species. Ford took Papilio multicaudata, P. philenor, Eurema gundlachia, E. proterpia, E. nicippe, E. boisduvaliana, Mestra amymone, Melitaea thekla, Limenitis astyanax, L. archippus, L. bredowii, Vanessa cardui, Libytheana bachmani, Chioides albofasciatus, Urbanus dorantes, Atlides halesus, Strymon columella, and several others. Dickson also took a Heliconius charithonia. Gyrocheilus tritonia was very common the first week in September. The moths in Madera Canyon were not as plentiful as in seasons past. However, many good things were taken. Syntomeida hamptonii, Bertholdia trigona, Antaplagia comstocki, and Miracraera brillians were taken sparingly, whereas Lythrodus radiatus, Chrysoecia scira, Grotella soror, and B. binda were commoner than before. Several wings of Eacles imperialis were found in a mine tunnel where bats had brought the moths to feed upon them. No imperialis have been taken in the past.

The collecting season had been about two weeks early, due to the rains that started in the first week of July and continued to August 11. During a two weeks' stay we had only one good rain, of about 0.75 inch in 15 minutes at 6,000 ft. elevation. In early September the rains started again and continued through the month. Thorne found the Canyon poor Oct. 17-21, a rainstorm on the 16th apparently terminating the season abruptly.

In these desert islands (as we call these mountain ranges that are surrounded by desert) many plants occur that are of a tropical nature, and are kept alive by the heavy summer rains. This in turn produces a vast amount of insects that emerge during or just at the close of the rains. So far, from this one canyon alone we have recorded over 100 species of butterflies and close to 600 species of moths, with many hundreds of species of moths yet to mount and determine.

Around Yuma, March 19-20, only Vanessa cardui and Pieris protodice were found.

Contributors: J.L. Creelman; W.H. Evans; R.J. Ford; G.F. Miller; D.E. Parker; F.T. Thorne.

2. NORTHWEST- OREGON, WASHINGTON, IDAHO, BRITISH COLUMBIA

by John C. Hopfinger
Brewster, Washington

OREGON

From Oregon we have the detailed report of Prof. Macy, of Portland. "There was a cold winter in Oregon which froze petunias and geraniums which stay out without injury in the Willamette valley some years. There was some snow. It appeared that a late spring was in the making and early growth was retarded but a very warm two weeks at the end of February and favorable weather later produced emergence of late spring species as much as three weeks early. Toads bred a full month ahead of time in the high Cascade lakes, observed by the writer and

substantiated by the Biologists of the State Game Commission. Altogether the weather was excellent with very moderate amount of rain in the spring, and as usual, almost none in the summer. Not as much cloudiness as usual during the butterfly season."

"Very few Papilio zelicaon were seen, believed to be a reduction in population. P. rutulus and P. eurymedon were in good numbers in mountains of both northern and southern Oregon. In the Siskiyou Mts. of southern Oregon both species were abundant but ragged by the 3rd of July." Parnassius clodius (late May) and Euchloe sara were in usual abundance

in the Cascade Mts. near Portland. Colias eurytheme was very scarce in the Willamette valley as usual. C. chrysomelas in good condition were caught in 2 days of collecting in the mountains of southern Oregon. The first Danaus plexippus in several years was seen flying slowly about in Willamette valley near McMinnville on May 17; it was worn and dull and may have been an arrival from the south. Another fresh specimen was seen in the same place in mid-July. Coenonympha ampelos was only moderately common in the northwestern Willamette valley. Although it seldom fluctuates much in population, it was down considerably from its peak year of 1947, when Macy caught about a hundred in four hours collecting. Three worn Oeneis nevadensis were taken in the mountains of southern Oregon on July 2 and 3; no others were seen during the year. Speyeria callippe, fresh in July at elevations of from 4000' to 6000', was locally abundant in eastern Oregon around Bend. S. hydaspe was abundant locally in the mountains of southern Oregon, and some were still fresh July 3 and 4. S. cybele leto was rare; only one was taken in eastern Oregon, and several in the coastal mts.; 3 females were caught in August, as the thistles began to bloom. Boloria epithore was found in abundance in one locality in the coastal mts., in early May, just emerging. Euphydryas colon was rather abundant in swampy areas near Cascade Lakes. E. nubiligena occurred in less numbers than colon at Davis Lake, central Oregon. Melitaea hoffmanni was fairly common at one place in the mountains of southern Oregon at around 4500'; most were worn by early July. Nymphalis californica was scarce; only two were caught in the Cascades, and none were seen elsewhere. One N. milberti was seen and one fresh N. antiopa was caught in early July. Neither was seen west of the Cascades. Two Vanessa atalanta were seen near McMinnville; none elsewhere. V. cardui was abundant everywhere and was a nuisance in collecting. The larvae were abundant on thistle. The first, worn specimens appeared at McMinnville on May 13. No adults or larvae of V. carve were seen. As usual, Limenitis lorquini was generally not common in northern Oregon. It was found in some numbers in one swamp in the mountains of southern Oregon. Only two Lycaena mariposa were caught, near Black Butte in the Cascades. L. helloides and L. editha were fairly common in parts of eastern Oregon. Plebeius anna was locally abundant in swamps in south and eastern Oregon. P. saepiolus was in very moderate abundance. Only a few P. acmon were seen. The former has disappeared from its former haunts in places in the eastern foothills of the coastal mts., perhaps due to heavy sheep grazing. Lycaenopsis pseudargiolus and Glaucopsyche lygdamus were abundant in early spring in the mountains. Nothing unusual in skippers was seen.

WASHINGTON

WALLA WALLA REGION. How the weather affected the moth population in southeastern Washington is shown by the report from Cook, of Walla Walla. "The season of 1949 started with one of the most severe winters on record. The spring was rather late in starting, but most species of phalaenids were about on their usual schedule before June 1. Following the cold winter came an unusually dry spring and

summer, which affected many multi-brooded species.

"Phalaenids more abundant this year than in 1948 included Euxoa olivia, sponsa, messoria, tessellata, atomaris; Agrotis venerabilis, Protogygia lagena, Scotogramma trifolii, Platyperigea extima, Heliothis phloxiphaga and Autographa brassicae. The Euxoas returned to at least normal abundance following the heavy reduction in 1948, and the first brood of P. extima was the heaviest I have captured. These species are all normally abundant in this area, and were not seriously affected by the cold winter or dry summer.

"Phalaenids definitely less abundant than normal included Euxoa septentrionalis, Feltia ducens, Rhyncrogotis exsertistigma, Lacinipolia stricta, L. recitilinea, Xylomiges curialis, Orthosia hibisci, Leucania farcta (of which the summer brood was greatly reduced), Septis cuculliformis, S. cinesfacta, Oligia indirecta, Stibadium spumosum, Heliothis obsoleta, Schinia sexplagiata, Autographa californica and Hypena humuli. H. obsoleta, the corn earworm, was so nearly exterminated by the winter weather that no control measures were used around Walla Walla, and no reports of infested corn ears were received. Most of the species in this group are of more southern distribution or pass the winter as pupae or adults.

"A point of interest concerns the activities of Vanessa cardui in this area. The spring migration from the south was not particularly noticeable, but the following brood, which developed on Amsinckia in wheat fields, was very abundant, and the marching larvae caused considerable comment. This is not the normal host in this area, but the larvae were confined to this weed, and cleaned it out of many wheat fields. The following brood of butterflies was very abundant."

BREWSTER REGION. The winter of 1948-49 was very severe, with deep snows and temperatures well below zero for weeks at a time. The snow disappeared on the river levels about the middle of March, and the first moths showed up at light on March 19. About the middle of April, right on time, the first butterflies were out. Callophrys sheridani, always scarce, showed in some numbers, 5 being taken the first day out. Several C. affinis, and 2 Papilio zelicaon also were found at that date. Late in April it turned cold, and a hard frost killed tomato plants. May 5, along the Columbia 3 P. indra were seen.

In greater numbers than for many years were: Callophrys affinis; Euchloe ausonides, Euphydryas anticia; Mitoura spinetorum (mid-May); Phyciodes mylitta; and the Catocala spp. About average were: Papilio daunus; Euchloe creusa; Phaedrotes piasus; Glaucopsyche lygdamus; Plebeius acmon; P. montis; P. melissa (♂ early June at Alta Lake); Lycaena heteronea (ditto); L. helloides; Minois oetus (pale arid form); Coenonympha elko; Erebia episcopa (mid-June at 5000'); Boloria epithore (ditto); Polygonia spp. & Nymphalis milberti (ditto, hibernators); Strymon saepium, titus, and acadica in late June (Alta Lake); Speyeria cybele leto, zereus, coronis (along Methow River in early July); S. hydaspe; S. mormonia (July 30 - 2 weeks earlier than 1948); S. atlantis. Very much reduced this year were: Melitaea sterope; Minois paulus; M. baroni; Erebia vidleri; Oeneis chryxus; Colias interior; C. edwardsii; Polygonia spp. Oeneis nevadensis was absent this year as expected;

FIELD SEASON SUMMARY 2. NORTHWEST - cont.

it swarms in alternate years and is due in 1950. Nymphalis californica is still at a low ebb after the outbreak of 3 years ago, when they swarmed all over the country. Papilio rutulus and P. eurymedon continued the downward trend of the last 5 years. P. oregonia, a D.D.T. victim, was fairly numerous in spring but almost absent in later broods. A long-tailed P. indra ("pergamus"), seen very rarely here, was taken at Alta Lake in late June. Pseudohazis larvae, usually abundant in greasewood, were absent.

Limenitis archippus was common here in 1914-21, but since 1921 I had seen exactly 3, a ♂ I took and 2 ♀♀ I left for seed. On Aug. 29 of 1949, my neighbor Galbraith brought me 5 ♀♀ and 2 ♂♂ all in good condition, taken right around his house. He also brought a ragged specimen at the same time which is either a melanic or a hybrid lorquini x archippus (lorquini is fairly common here).

Apparently new State records were Lycaena mariposa (10 taken in Ferry Co., July 7) and Polites themistocles (on my lawn).

PUGET SOUND REGION. From Seattle, Johnston, the famous collector of moths in all sizes, wrote: "On the whole, conditions were excellent. On two nights moths kept coming to the gasoline lanterns until daylight. Each time some 400 specimens were secured." Collections were made in eastern and western Washington and Oregon. "I have just started the job of mounting the summer's take, so cannot give details as to the species taken, dates secured, etc., as there are about 10,000 specimens of butterflies, macros, and micros to handle. I will be lucky to get it done by the time next year's collecting starts."

From that tireless collector, Frechin of Breerton, comes the following: "Weather conditions apparently played an important part in the comparatively excellent collecting conditions in the early spring, and the very poor collecting encountered in the summer and autumn. A very dry period extending from late spring well into summer had a pronounced effect on the number of butterflies found." The following species were found in numbers well above normal: Anthocharis sara; Boloria epithore; Strymon melinus; Incisalia iroides; Proteides clarus; Thorybes pylades; Pyrgus ruralis; Erynnis persius; E. propertius; Carterocephalus palaemon; Ochlodes sylvanoides; Polites sonora; Atrytone ruricola; Papilio rutulus; and P. eurymedon. Incisalia polios had the best season I have ever recorded. Euphydryas editha, as usual, appeared by the thousands on Tenino Prairie.

The following species appeared in very small numbers: Colias occidentalis; Parnassius clodius; Pieris napi; Minois alope; Phyciodes mylitta; P. campestris; all Polygonia; Nymphalis californica; N. milberti; Plebeius icarioides; and Mitoura nelsoni. Several species were not even seen, including Papilio zelicaon, Neophasia menapia, Euphydryas colon, Nymphalis antiopa, Mitoura johnsoni, Polites mardon, Strymon titus. Speyeria cybele was almost nonexistent at the type district; logging operations are probably prime factors in this scarcity. Notable captures and new records for western

Washington include the following: Speyeria zerene; Hesperia hulbirti (one taken at sea level); H. harpalus and Amblyscirtes vialis (Mason Co.); Hesperia juba (one near Camp Spelman); Erynnis propertius (common after many years' absence). All other diurnals endemic to the Puget Basin appeared in normal numbers. Moth collecting was very good. Several Platysamia eurvalus ♂♂ were taken, using cecropia ♀♀ as an attractant. Smerinthus cerisyi had a very good year. A colony of Hemaris diffinis was found in Mason County. Pseudohazis "eglanterina", usually rare, appeared in moderate numbers.

The islands of Puget Sound are of great interest to the collector, and we have a report from Mrs. Henriksen of Orcas Island. She found that collecting began about the usual time, on April 14 with the first Incisalia eryphon and Strymon melinus of the season, both very scarce. More plentiful than last year were: Phyciodes mylitta; Speyeria hydaspes; Vanessa cardui; and Platysamia eurvalus (30 at light). Much reduced from 1948 were: Speyeria zerene; Nymphalis milberti; Vanessa carve (swarmed in '47 and '48); V. atalanta (absent); Limenitis lorquini; Parnassius clodius; Oeneis nevadensis (none found); Neophasia menapia (still declining); Arctia caia; White Satin Moth (millions on silver maples in '47 and '48; none in '49). About as usual were: Papilio rutulus and eurymedon (abundant); P. zelicaon (rare); Incisalia iroides (scarce); Coenonympha ampelous (common); Anthocharis sara (common); the Blues (not common); Polygonia spp. (numerous); Nymphalis antiopa (ditto); Pseudohazis "eglanterina" (very abundant); Hemaris diffinis (common); Smerinthus cerisyi (ditto). One Catocala relictata (Sept. 14: Mt. Vernon) and a Celerio intermedia were taken. Only 3 C. lineata were taken in 2 years.

BRITISH COLUMBIA

Vancouver Island has many interesting species, and we are fortunate to have Guppy, of Wellington, to tell us about his experiences in that locality. He says: "Except for Sphingidae the season was better than average. Extreme earliness of all species, both moths and butterflies, was noticeable. A few specific dates recorded follow, with '48 dates in parentheses: Lycaena helloides May 17 (about June 1); Limenitis lorquini May 30 (June 20); Speyeria zerene June 18 (June 26); Minois alope July 3 (about Aug. 1). Weather conditions: the winter was very unusual. Cold dry weather prevailed from late December until about February 20. This is in contrast to the usual Pacific winter in which mild wet weather predominates. After February 20, the weather improved with extreme rapidity. Spring was early, dry and warm. The summer was cooler and wetter than normal, but better than '48."

"Following are most noticeable changes in butterfly populations. Papilio rutulus and P. eurymedon continue plentiful. Rutulus most particularly is increasing in numbers. In '47 eurymedon was by far the most plentiful. Last year both species were seen in about equal numbers. During '49 rutulus easily outnumbered eurymedon." A fair number of P. zelicaon (hitherto nearly absent) were seen

FIELD SEASON SUMMARY

here in fresh condition, though on the west coast of the Island it appears much commoner than rutulus or eurymedon. Parnassius clodius showed extraordinary increase in numbers; during 1949 it abounded everywhere. Neophasia menapia, as recorded in the last Summary, is slowly coming back after nearly disappearing; in 1949 several specimens were taken, the first since 1945. After being sparsely common in 1948, Oeneis nevadensis vanished again; as far as Rhopalocera were concerned, this was the only disappointing feature of a satisfactory season. Boloria epithore shows exactly the same trend as Parnassius. Polygonia satyrus was common as usual; P. oreas showed a marked increase; P. faunus and P. zephyrus were found to be common in the mountains, where it may have been so all along.

Vanessa cardui was probably the most noteworthy feature of the 1949 season. It appeared in large numbers in the late spring (all worn specimens). They were definitely not here in the fall of 1948, and Guppy had seldom seen this species here before. Reproduction was evidently very successful, the webs of the larvae on thistles were noticed on all collecting trips. The new generation appeared in late July and fresh specimens were common during the remainder of the season.

Hesperiidae appeared on the increase. In particular, Erynnis propertius, P. persius, and Pyrgus ruralis were seen and taken frequently. Two speci-

2. NORTHWEST - cont.

mens of Carterocephalus palaemon were taken. These appear to have wandered north of their usual haunts and are not common anywhere on the Island.

Sphingidae were a failure. The Celerios I have not seen for years. Hemaris diffinis, usually common, was scarce. Smerinthus cerisyi, abundant last year, fell off badly. Telea polyphemus is still on the increase, though not common. Two Platysamia were taken, the first seen in many years. The usual common species, Isia isabella, Halisdota maculata, Hyphantria textor, and Diacrisia virginica, continue abundant, the last named nearly reaching pest proportions. Halisdota argentata, usually common, was scarce. Phalaenidae were also plentiful, especially early species. Noticeable in April were Dargida procincta, Epicnaptera americana, Behrensia conchiformis, Acerra normalis; Xylena curvimacla has increased and completely replaced X. cineritia and X. nupera, which were at one time more common. Of the later moths, Autographa ampla and A. corruga have increased at the expense of A. californica, which were plentiful during 1948.

No report was received from Idaho.

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3. ROCKY MOUNTAINS - NEW MEXICO, UTAH, TO ALBERTA

by J. Donald Eff
Boulder, Colorado

In considering a summary for this area, strung out as it is along the backbone of the Rockies, one must reflect not only upon the diversity of the terrain included, but also upon the wide range of botanical relationship to the various species and upon the constant changes in weather and their immediate effect upon the cycles of the various species. In this, the third report for this Area, it has already become apparent that the over-all Lepidoptera conditions have been, and probably will continue to be, exceedingly spotty. Collectors who have lived and collected in the mountains realize the difference in weather possible in different localities only a few miles apart, such as on the east and west sides of a mountain range or in adjacent valleys. This checker-boarding of similar mountain localities, with sufficient rainfall in some spots while others suffer from lack of it, seems to bear a direct relationship from year to year with the quantity and variety of species found in any one collecting area.

Most readers will recall the severe blizzards and winter of 1948-49 that hit hard at western Nebraska, Nevada, Utah, and Colorado. This apparently was a factor in collecting conditions for 1949 and may be the reason that the papilioes from northern Wyoming seemed to run smaller in size than is usual. However, there were many places in this area where collecting was excellent or at least improved. Spring species arrived about on time, even a few days early in a couple of places, and in the main

collecting was excellent. Standard, in New Mexico, reports a wet summer, but Colorado had its rainfall in early June, followed by a dry summer and an even drier fall season featuring beautiful days and lasted long enough to produce the oddity of people picnicking in the mountains on New Year's Day, certainly unusual here on the "Rooftop of the Nation".

In an Area like this, which is chiefly rugged terrain, human factors play but little part in the lives of Lepidoptera, as compared with orchard regions where DDT has entered the picture. Montana suffered somewhat from forest fires, but the rest of the Area had better luck. Locally, an explosion has set fire to, and may wipe out a huge peat bog at Caribou, a newly found and apparently excellent collecting spot. Overcollecting seems to have reduced seriously the numbers of Boloria frigga on the famous Tolland Bog.

From all points in this Area come reports to coincide with those from other regions relative to the great abundance of Vanessa cardui and Celerio lineata; and Danaus plexippus, usually a rather uncommon sight throughout the Rockies, has been observed in greatly increased numbers.

Here, the bulk of the V. cardui were observed in April, although still abundant at higher altitudes, including the alpine zone, at later dates. On the 28th of April Gordon Snow, a local resident, called Dr. Hugo Rodeck at the University of Colorado Museum

FIELD SEASON SUMMARY 3. ROCKY MTS. - cont.

about apparent migrations of this insect. Unfortunately neither Dr. Rodeck nor I was able to get there at the time to observe the actions, but Snow noted that at approximately 2:10 p.m. that day one swarm about 10 feet wide and 30 feet long and about 3 feet thick went by, flying rather close to the ground between houses, and heading south directly into the wind. The flock maintained its formation quite well. At 2:30 p.m. another and larger group, approximately 50 feet square, was observed, and thereafter many smaller groups until shortly after 3 p.m. when a stronger wind sprang up and put an end to the flights. I went over to observe shortly after 4 p.m. and the place was covered with thousands of specimens, but flying here and there with no apparent purpose. Minor, in western Colorado, in a splendidly written report, observed that the same was true in Grand Valley. His observations were over a longer period of time, planned to determine if they were migrants, but he could reach no definite conclusion. To use his words: "Some days they would flutter leisurely about the flowers and bushes, flitting about in all directions and going nowhere in particular. On other days great swarms of them would wing swiftly past, flying just a few inches above the ground, coming from the south-east and heading north-west. On still other days the direction would be reversed. The fact that the Colorado River flows through the Grand Valley roughly from south-east to north-west, and that the air currents generally follow the course of the river, may have something to do with the direction of the flights." One thing on which all who reported the excessive abundance of V. cardui agree is the fact that the greatest number appeared during April, reached their peak by the last of the month or the first week of May, and from then on declined somewhat in number.

Celerio lineata, while not approaching the numbers of cardui, was very common and quite evenly distributed.

In ALBERTA, Bowman, the only collector from that area, was handicapped by illness. However, a terrific storm apparently played havoc with Lepidoptera the last of July as almost nothing appeared in August. This was followed by a severe frost the first of September. He found it the worst year he has ever experienced.

No definite records for MONTANA were received.

In WYOMING, Downey reported the season slightly ahead of an average year. He found the Papilio's of smaller size than usual. His observations with regard to D. plexippus and C. lineata agreed well with those of the others. Also he noted that the Catocalas were not as plentiful as usual, and that the same was true of the Speyerias. Glasgow reported that what little collecting he did seemed to indicate a very poor season around Daniel.

The only records of UTAH Lepidoptera were from Lauck who travelled the length of the State by auto during the last two weeks of June. He believes

that much of his poor collecting may be attributed to the late opening of the season, a result of the extremely cold winter. He reported the collecting fair at Bryce Canyon, especially for Pieris, Phyciodes, Melitaea, and Anthocharis, and very poor at Zion Canyon where things were dry. Snow prevented collecting, except of swarms of Vanessa cardui, in the Kaibab Forest on the North Rim of the Grand Canyon, but enroute to the South Rim, at the border of the Kaibab, he found Minois meadii plentiful.

In COLORADO, Rodeck collected again in the Dinosaur National Park in the N.W. corner of the State. He found that area experienced a good spring and then a dry summer and this resulted in an advancement of the periods of flight of practically all species. Minois oetus was probably the commonest species, and a few more Papilio brucei were taken than last year. On the Western Slope, in the vicinity of Fruita, Minor reported butterflies in normal numbers, with a few slightly more common than usual and Papilio indra, P. daunus, Parnassius smintheus, Oeneis chryxus, Neonympha henshawi, and Megathymus yuccae absent. Lauck reported collecting at Mesa Verde in the S.W. corner of Colorado very good on July 1 with Colias alexandra, Limenitis weidemeyerii, and the Blues plentiful. It appeared that the collecting on the Western Slope was somewhat better than that on the Eastern Slope. The 3 Remingtons and I found good collecting on the Western Slope at Rabbit Ears Pass near Steamboat Springs, the middle of July. P.S. and I did note a considerable decrease in the Speyeria which abounded last year. Also Euphydryas anicia was not found, but this was offset by an increase in other species. In the south-central part of the State, Rotger enjoyed good collecting and made several discoveries. He found Minois meadii plentiful near Sanford. He also reported Speyeria as being scarcer. Along the Front Range of the Eastern Slope, Brown at the southern end near Colorado Springs, and I near the northern end, had good spring collecting, with the Theclini being particularly abundant. Summer collecting was rather spotty, with the alpine species in particular running from 1 to 4 weeks late and being generally fewer in numbers than usual. Not much is known about the eastern Colorado prairies, although the Remingtons stopped near Limon in late July and found Phyciodes picta common and fresh. Stallings reported Megathymus streckeri just emerging in S.E. Colorado on May 31 at 5000 feet and apparently flights of all species average.

This year NEW MEXICO has a little representation and we hope for more in the future. Standard writes from Belen that they had a wet summer and better collecting than in 1948, with notable increases in D. plexippus, V. cardui, Polygonia interrogatoris, V. atalanta, C. lineata, Limenitis, and Papilio, and Pieris and Colias about normal. Stallings was in N.E. New Mexico from May 23 to June 1, collecting principally Megathymus, but he took two Yvretta rhesus. They found M. streckeri flying at Santa Fe (7200') May 25 in good numbers. By May 27, it was beginning to show wear at Albuquerque at an altitude of 5200'.

COMPARISONS WITH OTHER SEASONS

Most species of Papilio occurred in approximately usual numbers, with P. daunus showing a decrease. Minor notes that Papilio indra minori seems to be increasing in numbers and range and apparently is gradually replacing the parent form of indra. C.L. Remington notes that Papilio brucei, absent in '34 and '41, and fairly common (for this species) in '37 and '47 around the middle of July, was more numerous this year, but after July 20. Parnassius seemed to be their usual abundant selves in most of the lower areas, but the alpine forms in some areas seemed to be entirely missing, with Mt. Evans the most notable example. Neophasia menapia did a swan dive after being very numerous in 1948. Pieris napi was very common as usual. Anthocharis gara was scarce again this year. Two years ago it was common. E. ausonides appeared in much reduced numbers, although larvae were common and occasionally parasitized by ichneumon wasps. Nathalis iole appears to be coming back somewhat after a complete wash-out last year; Rotger took some in southern Colorado and New Mexico and the Remingtons took fresh specimens at 10,000' in the mountains July 12-13. Here in Boulder and vicinity at 5300' I found them as late as the first week in November. Most of the Colias were about normal, with meadii showing a drop and alexandra being more plentiful than usual in the south, and scarcer in the Pikes Peak region. Coenonympha ochracea was common again. Brown found Eumenis dionysius fairly common in the Big Horn Mts. of Wyoming. Most of the Minois were about the same, with meadii apparently the only one to show an increase. In the Oeneis, uhleri was the big ground-gainer, with good catches reported throughout Colorado. O. chryxus seemed to be nearly absent. C.L. Remington notes that O. lucilla swarmed on Mt. Evans July 15, 1937, and was plentiful again in '47, but rather scarce in '48. This year on July 15 we found only a few specimens on Berthoud Pass (11,300'), and Charles, Jeanne, and P.S. found one female on Mt. Evans July 21. However, on August 7 at the same locality I caught 13 ♂ and 11 ♀ on a rather poor collecting day, and all specimens were fresh. Oeneis brucei is another that had been plentiful on Mt. Evans in '37 during the middle of July. On our return on July 16 from the Rabbit Ears Range we found a colony of them on Berthoud Pass, where we had not found them on several previous years. On August 7 I took some 30 specimens on Mt. Evans at a slightly higher elevation; their condition indicated that they had been flying about a week. Of the Erebias, episodesa was plentiful, magdalena about normal or slightly increased, callias about normal (at least in southern Colorado), and ethela, which you can normally expect to appear by July 23, did not reach full flight until August 4. With the exception of callippe, Speyeria showed at least a small decrease from 1948 levels in all areas. Boloria aphirape was the most abundant Boloria, with the rest of the genus holding their own. In Boulder County all of the Checkerspot's decreased in quantity, with Melitaea arachne being nearly absent; only one specimen was taken near Nederland, where two years ago they swarmed. However, in Mesa County, Minor found M. acastus and Euphydryas anicia much more common than usual. In Phyciodes it was gorgone "as usual", with barnesii showing the biggest drop in some lo-

calities. Polygonia seem to be staging a comeback. Limenitis weidemeyerii, Vanessa atalanta, and Nymphalis milbertii were commoner than usual. Larvae of the latter two were heavily parasitized by larvaevorid flies. In the Theclini, Strymon californica, S. saepium, and Mitoura spinetorum surged slightly. Strymon liparops was found near Boulder. Incisalia schryverii and eryphon increase considerably. Lycaena snowii was perhaps more numerous than heretofore and the same was true of heteronea and nivalis. Brown found editha abundant on August 24 at Towgowtee Pass, in Wyoming. In the Blues, Plebeius minnehaha was scarce and very, very late. My biggest take of these was on August 21, more than a month from their usual flight period, and they were fresh specimens. Lycaenopsis pseudargiolus, much more common than in recent years, was still flying as late as July 10 at 8000'. Glaucopsyche lygdamus was taken July 27 & 29 at 9000', very late records. Most of the skippers were less numerous than last year, but Pyrgus centaureae was unusually common throughout the alpine regions. In the moths, Pseudohazis nuttalli was plentiful in the Rabbit Ears Range, and also near Caribou at about 10,000 feet. In south-central Colorado the larvae of a species of Malacosoma completely defoliated millions of aspen trees. Gnophela vermiculata was very abundant. Rotger found a few Ctenucha cressonana near Capulin.

Some of the highlights in this area were discoveries by the collectors. Rotger's prize was the capture of several specimens of Oeneis daura oslari! He also took Speyeria cybele, Atlides halesus, and found a colony of Boloria freija at Platoro, Colorado, which may be a southern record. Brown took 3 Yvretta rhesus, the first since the middle 1930s, as well as the first Euchloe olympia and Callophrys sheridani from the Colorado Springs area; his other unusual captures were Agraulis vanillae, Callipischo behrii, and Libytheana bachmanii. At Marias Pass in Montana he took a worn specimen of Speyeria that may be the long-lost nokomis! Here in Boulder County, the Remingtons added Eurema mexicana to E. nicippe taken last year, and also Junonia ccoenia, Anaea andria, and Pholisora catullus. My most exciting finds were Incisalia irodes and Pieris calyce. One other item, of which a few specimens showed up this year, has created a lot of interest: a race of Boloria toddi (= bellona). It may not be new, for it was apparently recorded by the Wheeler expedition, but since then has been overlooked or not found, for this year is the first mention we have heard of it. Brown took it, Rotger found two specimens north of Meeker, in the N.W. part of Colorado, and the Remingtons and I found it, not only on Rabbit Ears Pass, but also in a little willow draw in the sagebrush east of Muddy Pass.

In conclusion, a thumbnail sketch shows the following: That 1947 was a peak year for most species in this Area, with 1948 and 1949 showing decreases. Only 3 or 4 species reached a peak in 1949. The season began about on time, but most of the summer species were a little late, with the alpine in particular showing a greatly retarded flight period. Contributors: K. Bowman; F.M. Brown; D. Downey; C. Glasgow; A.G. Lauck; W.C. Minor; P.S. C.L., & J.E. Remington; H. Rodeck; B. Rotger; D.B. Stallings; O.D. Standard.

4. GREAT PLAINS- TEXAS AND EASTERN PLAINS OF ROCKY MTS. STATES
TO SASKATCHEWAN AND MANITOBA

by Don B. Stallings
Caldwell, Kansas

For the third successive season spring came late on the Great Plains. A few more times of this and we will have to revise our idea of what "late" is. 1949 on the Great Plains was ushered in with "The Great Blizzard of '49". The blizzard swept into the plains on January 2 and snowstorms continued until February 19. During this period temperatures went as low as 50° below zero with winds up to 80 miles an hour and snow drifts up to 30 feet. Blizzards extended into southern Oklahoma; even the "Valley" in Texas had freezes that destroyed citrus fruit.

Of most interest is the negative report of no material changes observed in individual Lepidoptera. Generally the harder-to-get species were more numerous than usual. After the storms I expected to see some extreme spring forms, but they did not show up.

NORTH

Reports from our northern observers indicate that the season was a little earlier than usual for that part of the Area. Collecting data in June, for Plebeius saepiolus, Glaucopsyche lygdamus, and Coenonympha inornata, indicate that the season was about 7 days early at that time. In Saskatchewan a series of 12 Poecilopsis rachelae was collected, the largest series for any one recent season. Light trap collecting was especially good and produced three new records of phalaenids and a number of rare notodontids.

Collecting in the north was good up to the middle of July, but thereafter was poor. Many species usually abundant were rare, including all Speyeria, Boloria toddi, Colias, Limenitis, and Lycaena. Erynnis brizo and juvenalis were more abundant than usual. Vanessa cardui appeared first in June; all specimens were worn, which would indicate that they were migrants. Later in the year there were "swarms" of fresh specimens.

In Manitoba the 1949 season was preceded by a very dry fall. The winter was steadily cold without any particularly low temperatures. In contrast the 1949 fall in the north has been wet.

MIDDLE

In the Kansas-Oklahoma area the season commenced dry and about 10 days late. Incisalia henrici was at normal or above. Euchloe olympia was above normal. Erynnis were common in April. Phyciodes gorgone produced one of their biggest flights in April. Hesperia metea was observed in good numbers April 16 in the Wichita Mts. of Oklahoma. Megathymus yuccae again produced a good flight throughout the area.

The month of May was very wet. As a result observations were restricted, but the May flights appeared below normal. This observation may be due, in part, to the fact that collecting was usually

done on the week ends and the rain clouds seem to pick Saturday and Sunday to unload. The fall was somewhat more wet than 1948 and fall forms appeared to occur in normal numbers.

At Ottawa, Kansas, usually common Sphingidae, such as Isogramma hageni, Sphinx eremitus, S. chersis, S. drupiferarum, Hemaris diffinis, and Xylophanes tersa, have been remarkably scarce. New records for the locality were: Darapsa pholus (1); Pholus labruscae (2 ♂); Erinnyis alope (♀). Cato-calinae were very plentiful at sap, especially Catocala epione, C. illecta, C. grynea, C. micronympha, along with rare C. amestris and C. insolabilis. An uncommon migrant taken at willow sap June 22 was a ♀ Erebus odora. Butterflies in fair numbers this year were: Papilio marcellus; P. cresphontes; Zerene caesonia; Lethe portlandia; Speyeria cybele; Lytheana bachmani; Feniseca tarquinius; and Lycaena thoe.

A sampling of Colias in Cloud County, Kansas, on July 3rd disclosed 73% eurytheme, 13% philodice, 13% hybrids, with 43% of the females white.

SOUTH

Spring collecting in the Dallas-Fort Worth area was above normal. Species particularly abundant were: Danaus plexippus; Euptoieta claudia; Nathalis iole; Incisalia henrici; Erynnis horatius; Atlidea halesus; Achalarus lycidas; and Amblyscirtes nyssa. Unusual captures were A. eos and Mitoura xami. In May the heavy rains in Texas produced major floods in the Ft. Worth and Dallas area. As a result there was considerable use of DDT in the area. Collecting thereafter was below normal. Megathymus yuccae was surprisingly absent around Dallas. In September, near Tyler, Lerodea l'herminier and Amblyscirtes alternata were discovered.

Western Texas received more rain than usual, which resulted in an extra large assortment of wild flowers in bloom. Collecting was well above normal. In the Big Bend country of southwest Texas the following species appeared in good numbers: Strymon polingi; Strymon alcestitis; Papilio multicaudata; Phyciodes vesta; P. picta; P. phaon; Megisto rubricata; Euptychia dorothea; Asterocampa clyton; A. celtis; Limenitis bredowi; Achalarus casica; Erynnis meridianus; E. tristis; E. funeralis; Orisma edwardsii; Antigonus evansi; A. pulverulenta; Amblyscirtes eos; A. nyssa; A. texanae; A. oslari; A. nereus and A. phylace. The following were uncommon there: Hesperia uncas; H. viridis; H. pahaska; Yvretta carus; Cogia hippalus. Larvae of Megathymus mariae were abundant in Agave lecheguilla in western Texas.

Contributors: P.F. Bruggemann; H.A. Freeman; W.H. Howe; E.M. Kinch; C.S. Quelch; C.L. Remington; J.R. Turner; R.C. Turner Jr.

by P.S. Remington, Jr.
St. Louis, Missouri

Although it is not easy to generalize about the weather in an area as large as this, most observers reporting agreed that the unusually mild winter did not affect the quantity of Lepidoptera produced nor upset greatly the usual procession of species. There was some diminution in the western part of the zone in May and June possibly due to cool, dry weather, but July and August showed the usual pattern and the mild fall extended the season longer than usual. Near St. Louis butterflies were seen on the wing as late as November 20.

MISSOURI. Collecting started in early April as usual and the same species were found as reported last year, except that no Euchloe olympia at all were seen in their usual haunts. The same is true of Strymon ontario, which, although always rare, could usually be found in certain spots. It has not been seen here in numbers for nearly ten years now. Vanessa cardui larvae were very numerous on hollyhocks in St. Louis on July 1, which was the date we left for Colorado. The prolonged fall here brought out the late season species in numbers. There was a noticeable migration of Danaus plexippus through St. Louis in early September - no large masses of butterflies, but numbers of individual specimens flying south for at least a week. An unusual capture was several specimens of Feniseca tarquinius within the city limits. The larvae have not been discovered yet, but may feed on the aphids which infests the hawthorn trees.

ILLINOIS. Lauck, of ALTON, like the writer, spent part of the summer in the Rockies, but he reported good spring collecting in April and early May. He was the only collector to find Papilio in large numbers, most collectors in this zone reporting that Papilio seemed scarce this year. He found ajax, P. glaucus, philenor, troilus and P. cresphontes plentiful. It was also a good year for Lethe portlandia. Lauck's report on the migration of Danaus plexippus is interesting. He saw two flights, one on Sept. 10, the other on Sept. 20. "The second one centered at Jerseyville and numbered several thousand. The Monarchs stopped over night in the trees on one of the main streets of the town. A thunderstorm hit Jerseyville early on the morning of the 20th, but the Monarchs only tightened their grip and rode out the storm in great shape. After the storm was over, the sun came out and the Monarchs were again on their way south." Lauck also reports more Eacles imperialis during July and early August than at any time in the past 15 years. Several were raised to the pupa stage.

From the CHICAGO area, Wyatt reported that the Heliothinae and Papaipema spp. were in average numbers. Leuschner, a welcome new reporter, noted some significant absences of species usually taken near Chicago - very few Phyciodes nycteis, no Euptoieta claudia, Lycaena dione, or Libytheana bachmanii. Many Teles polyphemus larvae were found on swamp willow and he says "I am still looking for my first parasitized polyphemus larva or cocoon, and yet about 5 out of 6 Platysamia cecropia larvae that I

have found have been attacked." Datana ministra was found in numbers feeding on willow in late August. Phlegethontius sextus were more numerous than ever before during late August and early September, but no Celerio lineata or Paonias excaecata were seen, although quite plentiful in other years. Catocala were out early. Another Chicago collector, Woodcock, has started an ambitious project with moths. He prepared lighted sheets in his back yard and collected virtually every night of the year through to November. He has hundreds of specimens with full data and hopes to have a complete list of his city ward by late spring. Woodcock's only comment on butterflies was that Pieris rapae seemed exceedingly common in Chicago this year. Wren, contributing the most detailed report for Area 5, considers 1949 to be one of the best butterfly years he can remember. He notes, as I did, that an unusual hot spell early in spring confused the time of emergence of Euchloe olympia, since he found none at the expected time. In the Chicago area, he found the following abundant: Speyeria cybele, S. aphrodite; Boloria selene; B. toddi; Phyciodes tharos; Nymphalis milberti; N. antiopa (scarce after mid-summer); Vanessa atalanta; V. virginensis; Junonia coenia; Limenitis astyanax; L. archippus; Lethe portlandia; L. eurydice; Minois alope; Strymon acedica; Lycaena hypophlaeas; Everes comyntas; Zerene caesonia; Colias eurhytheme; C. philodice; Pieris protodice; Papilio ajax; P. glaucus; Anclyorhynchus numitor. Scarce species commoner in 1949 than usual were: Nymphalis i-album; Asterocampa celtis; Lethe creola; Libytheana bachmanii; Nathalis iole (one). He found Papilio troilus absent this year.

At COAL CITY, Grundy Co., Wren found the following species common in early August: Danaus plexippus; Limenitis archippus; Papilio ajax; Colias eurhytheme; Pieris rapae; Everes comyntas; Minois alope. Colias philodice, Nathalis iole, Lycaena hypophlaeas were scarce. At one spot along the highway for a stretch of one-half mile on one side of the road he saw tens of thousands of the beautiful little arctiid, Utetheisa bella, on the roadside vegetation; not one was on the other side of the highway.

INDIANA. Price took a worn Calephelis muticum in a bog in Lagrange County on August 8 (new State record?). Leuschner took Catocala illia, C. lachrymosa, and C. paleogama at Tremont on July 4.

OHIO. There were three reports from the State. Romine spent most of his vacation in Colorado, but reports Lethe portlandia more common than he has ever found it in Ohio, in company with Asterocampa celtis. Price observed Vanessa cardui common for the first time in 7 years at Payne. Hibernating specimens appeared in numbers in early May. In July and August a few fresh ones appeared, but he thinks spraying reduced their numbers. Rare finds were Phoebis sennae, Nymphalis i-album, Prenes ocola, Atrytone logan and Lerodea fusca, all taken in Paulding and Williams Counties. Ehrhart, of Antwerp, captured three specimens of Atrytone dukesi, formerly known from Alabama.

FIELD SEASON SUMMARY 5. CENTRAL - cont.

KENTUCKY. Carl Cook, of Crailhope, contributed the only report. Because of the mild winter, butterflies appeared about 2 weeks ahead of schedule, some as early as March 5. Papilio marcellus was out in normal numbers for the first time since 1946. Incisalia henrici, usually rare, was quite numerous. Other early captures included Strymon m-album and Anthocharis midea. The heavy rains in June and July seemed to affect Euptychia gemma, E. euryta, Mitoura damon, and Libytheana bachmanii, which were less common than usual. Species occurring in normal abundance were Phoebis sennae, Eurema nicippe, E. lisa, Junonia coenia, Limenitis astyanax, L. archippus, Asterocampa celtis, and Strymon cecrops. Notable captures were one Euphydryas phaeton and one very worn male Speyeria diana. On October 3 a great many fresh Anaea andria were observed. There was also a great fall abundance of Danaus plexippus.

MINNESOTA. Leuschner collected in Minnesota from July 10 through August 14, and sent the only records from that State. Among the butterflies, Lethe portlandia and Feniseca tarquinius were common in the forests. L. eurydice was at the end of its season when he arrived. Speyeria cybele, Boloria toddi, Limenitis arthemis and Coenonympha inornata were also noted. He concentrated on moth collecting at lights. No Catocala were seen although he carefully examined the trees in the daytime. Phalaenidae were scarce at lights - only one species of Mamestra and a few Acronicta were taken. The most common species of moth was a species of Olene. Malacosoma americana was next most frequently taken. It was rather late for Saturniidae and only Automeris io was taken. Of the Sphingidae, Smerinthus geminatus was the commonest. Others included Pachysphinx modesta, Atreides plebeia and Sphinx kalmiae. Arctiidae were well represented and included Hypoprepia minata, H. fucosa, Phragmatobia rubricosa, Apantesis virgo, A. virguncula, Diacrisia virginica, Arctia caia, and Haploa confusa.

WISCONSIN. Griewisch at GREEN BAY sent some fine specimens of Speyeria atlantis, Minois nephele, Poanes hobomok pocohontas, Hesperia sassacus, Plebeius scudderii, and P. saepiolus. Other common species were Carterocephalus palaemon, Polites mystic, P. peckius, P. themistocles, Phyciodes tharos, Thorybes pylades, Proteides clarus, Atrytone ruricola. Less common were Erynnis brizo, E. juvenalis, Amblyscirtes hegon, Colias interior, Atrytone logan. On June 13, Griewisch caught a fresh Zerene caissonia, his first. Other unusual catches were Atrytone bimacula, Limenitis astyanax, Libytheana bachmanii, Asterocampa clyton, Phycanassa viator. Entirely lacking were Phyciodes nycetis and Melitaea harrisi.

Arnhold, at CHIPPEWA FALLS, had success in raising Catocala amestris on Amorpha fruticosa (False Indigo). Nearly full grown larvae were found on this plant and all but one (parasitized) emerged by July 15. This plant is also host to C. nuptialis. Arnhold also noticed Phlegethontius quinque maculatus which became a nuisance on tomato plants, increased this year, like other Sphingidae. Toward the end of May he saw fresh Danaus plexippus flying north and they were plentiful all summer, although no mi-

gration was observed. Arnhold mentions that in nine seasons of collecting in Wisconsin he has never seen any of the black Catocala, such as epione, and believes they do not get that far north.

Sieker, at MADISON, reports a good year, with Boloria selene and B. toddi(bellona) extremely abundant as was Speyeria aphrodite. Strymon falacer and S. edwardsii and the Vanessa spp. were more common than 1948. Less common than usual were Lycaena epixanthe and the Polygona. Absent were Glaucopsyche lygdamus, Euchloe olympia, and Colias interior. Of the sphingid moths Sieker took Sphacodina abbotii, Amphion nessus, Cressonia juglandis, Smerinthus cerisyi. He reports the saturniid moths becoming more abundant every year; Actias luna (very common); Platysamia cecropia (common); Teles polyphemus (common), Callosamia promethea (rare). By sugaring, Sieker had good success with Catocala this year, taking ilia, coccinata, nuptialis, amestris, cerogama, relicta, uniuga, parta, paleogama, cara, amatrix, vidua, relecta, epione, concombens, amica, mira. Other moths seemed scarcer than usual.

MICHIGAN. Wren travelled to WAKELEE, Cass Co., to try to find the rare Megisto mitchelli. Although five collectors in the party searched the type locality carefully, no mitchelli were seen. It is to be hoped that this rare species has not been exterminated. Species taken included Euptychia euryta, Strymon acadica, Lycaena thoe. On a trip in September to Roxana, Eaton Co., additional species found were Danaus plexippus (more abundant than usual), Limenitis archippus, Boloria toddi, Nymphalis milberti, N. j-album.

Beebe, at ECORSE, reports a migration of Danaus plexippus on August 4, flying after sundown. He found Epiblema strenuana, E. otiosana, and E. scudderiana common as usual. He made some unusual captures of moths, mainly micros. One of these, Epinoctia nonana, was previously known only from Colorado and Illinois. Another Michigan record was Eucosma floridana. Pigritia spp. seem to be increasing.

Mrs. Hynes, of BATTLE CREEK, continued her successful efforts to rear moths, and her observations of butterflies were about the same as last year.

Near YPSILANTI, Glench found Lycaena helloides and Thymelicus lineola much reduced in numbers from 1948. He found no spring brood of the usually common Pieris protodice, and Strymon falacer and S. carvaevorus seemed scarcer than in 1948. Flight periods in general were the same as in 1948.

ONTARIO. W.R. Henson observed a Vanessa cardui migration near Sault Ste. Marie on September 30, moving south about 4 miles per hour along at least a two mile front, about 30 to 120 specimens per ten yard front per minute.

No reports were received from West Virginia or Iowa.

Contributors: F.R. Arnhold; R. Beebe; H.K. Glench; C. Cook; O.E. Ehrhart; L.W. Griewisch; W.R. Henson; Mrs. Vonta P. Hynes; A.G. Lauck; R. Leuschner; H.F. Price; C.L. Remington; R. Romine; W.E. Sieker; H.E. Woodcock; G.R. Wren; A.K. Wyatt.

by Ralph L. Chermock
University, Alabama

Climatic conditions in the southeastern United States were relatively normal during 1949, although spring was somewhat late in the northern portions. As a result, the various species of Lepidoptera were little affected, and the variation in abundance and occurrence was slight.

The collecting season in MARYLAND and the DISTRICT OF COLUMBIA was fairly normal, although a somewhat colder and extended winter had delayed the emergence of a number of species in the spring. Fales, collecting primarily in Prince George and Montgomery counties, noticed that the following species were late in appearing: Papilio philenor; Papilio glaucus; Papilio marcellus; Anthocharis midea; Eurema lisa; Junonia coenia; Vanessa virginiensis; and Limenitis astyanax. The following species were on wing somewhat earlier than normal: Vanessa cardui; Colias eurytheme; Papilio polyxenes; and Poanes zabulon. The remaining species appeared at about the same time. It is significant that a majority of the species which were late in emerging are more southern in distribution; while the remainder were species normally associated with cooler climates. In the vicinity of Washington, D.C., Shappirio noticed that the spring broods of Papilio marcellus and Anthocharis midea were rare. He also stated that the season was two to three weeks late in the early part of June, but returned to normal during August. During this period, Minois alope was exceedingly abundant in comparison to previous years; and Papilio marcellus was unusually common at Great Falls and London County, Va.

Blevins has made an interesting observation on the effect of DDT. He writes, "The swamp, which is the type locality of Poanes massasoit hughii Clark (Beltsville, Md.), was sprayed with DDT from planes in October, 1948, and April, 1949. Hughii has been rare in recent years and as far as I know, none were taken in 1949. These swamps constitute a good collecting locale for many local species in normal years, but this year the quantity of specimens was much less than normal, especially hesperids. Neighboring swamps seemed to have their usual number of specimens. Thus, the evidence indicates that the DDT was harmful to Lepidoptera. However, the data is too incomplete on which to base a final evaluation."

In VIRGINIA, King noted that the season seemed to be fairly normal, both in temperature and the occurrence of butterflies. However, in South Carolina, he mentions that the fairly mild winter resulted in an erratic flowering of plants, affecting the abundance of many of the rarer species such as Speyeria diana. Gottschalk noted particularly that neither Vanessa cardui nor Danaus plexippus was unusually abundant around Salem throughout July.

Shappirio has made a significant observation. "I collected along the South Carolina coast between Myrtle Beach and Georgetown. Thus, I was in the path of a hurricane which arrived several days after

I reached Myrtle Beach. The day after the hurricane hit, a Monday, I collected Hymenoptera as if there had been no storm; insects were in great numbers. As might be expected, probably the majority of the older specimens were destroyed. I did find a few battered bodies of Phoebis subule under a pavilion. During the following days, Lepidoptera appeared to be rather common. The common spp. of the region such as A. vanillae and the common Sulfurs were very abundant."

In GEORGIA, Eustis found the seasons and flights normal. However, Euptychia sosybius ("Second brood in August") was abnormally abundant, along with Polygonia interrogatoris, Limenitis astyanax, L. archippus, Asterocampa celtis, and Libytheana bachmani. Rhabdoides cellus, which used to be common in the area, has not been observed for seven years. King has collected Strymon liparops and Anthocharis midea at Savannah, along with Heliconius charithonia. In western Georgia, Smith observed a fairly normal season, with the various butterflies emerging at the expected times. He also found the first Megathymus yuccae since 1941 in that area.

King, collecting in central FLORIDA, mentioned that the year was relatively normal. However, Euptychia cymela was scarcer than usual, and was on wing somewhat earlier. Anartia jatrophae failed to exhibit a northern migration this year; and Strymon calamus had failed to appear around Lake Apopka by May 15. In southern Florida, a mild winter together with the storm damage of 1948 upset the Lepidoptera. Papilio aristodemus ponceanus apparently was on wing somewhat earlier than normal, although the other butterflies were normal in their appearance.

In ALABAMA, the winter was relatively mild. As a result, freshly emerged specimens of Phoebis subule, Eurema lisa, E. nicippe, Colias eurytheme, and Pieris rapae were observed frequently throughout January and February. Occasional specimens of Agraulis vanillae were also seen during this period. The spring flight was normal. The summer was relatively humid, and butterflies were then more abundant than in 1948. However, some species were relatively scarce, such as Euptoleta claudia, Junonia coenia, and Atalopedes campestris. On the other hand, Eurema iucunda, Lethe portlandia, Euptychia sosybius, E. gemma, Vanessa cardui, Asterocampa celtis, Amblyscirtes textor, and Lerema accius were unusually abundant. The fall was normal, with flights continuing well into November before numbers became markedly depleted.

Some interesting observations have been made on the migration of Danaus plexippus, the Monarch Butterfly. On September 18, 1949, Shappirio observed about two dozen specimens flying south against a gentle southerly breeze between Frederick and Hancock, Maryland. Fales made a number of observations along the coast. The first migrating specimens were seen on August 6, after which time they slowly increased in numbers until they were extremely abundant

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during the latter part of September. He observed large migrations at Piney Point, Md., on Sept. 23 and 24, which suddenly disappeared on the 25th. On October 14 he observed another large migration at Beltsville, Md., flying at about 400 feet, and all heading south at about 100 specimens per hour.

King noticed that in the Roanoke area of Virginia, the Monarch was abundant from August 15 to October 15. The flight seemed to reverse itself daily so that it was impossible to interpret the general direction of migration. In Georgia, Eustis noticed a thin flight in October, flying in a southerly direction. At Tuscaloosa, Alabama, a sparse migration in a northerly direction was noted during April. The butterflies were never markedly abundant, and exhibited a rather leisurely flight, feeding on flowers very frequently. In the latter part of September, the Monarch again began to appear in increasing numbers, until during the first two weeks of October, relatively large numbers were seen flying in a southerly direction. On October 21 a large

6. SOUTHEAST - cont.

mass migration was observed flying through Tuscaloosa at an altitude of about 300 feet, forming a dark cloud in the sky. Migrating individuals were found as late as November 19.

Fales found Phoebis eubule migrating over Chesapeake Bay at altitudes of three to twenty feet, on October 1, continuing throughout the afternoon, with hundreds passing over the area. In Tuscaloosa, Alabama, a relatively large migration of this species was observed, beginning in the early part of October, and lasting throughout November, with the majority of specimens migrating in a southerly direction, occasionally southeast.

No reports were available on Tennessee, Arkansas, Mississippi, and Louisiana; nor any data on Heterocera!

Contributors: T.B. Blevins; W.M. Davidson; H.W. Eustis; J.H. Fales; C.W. Gottschalk; H.L. King; D.G. Shappirio; M. Eugene Smith.

7. NORTHEAST - MARYLAND NORTH TO SOUTHERN QUEBEC

by Eugene G. Munroe
Macdonald College, Quebec

In the Northeastern Area the season of 1949 was uniformly preceded by a mild winter with light snow cover; moderate temperatures probably obviated excessive frost damage; in the Rochester, N.Y., area there was little ground frost, in contrast to the deep penetration reported last year. The spring was rather early and in most areas reasonably warm; species tended to emerge very early in spring and particularly in early summer; this tendency appears to have been more evident inland than in coastal localities, with many species appearing from two to five weeks earlier than in 1948. Unusual drought prevailed throughout the region from early July to early September, with a deleterious effect on collecting in most localities; marshy and wooded areas were much less severely affected than dry or open ones, where collecting approached or exceeded normal levels. In Nova Scotia and the Canadian and Hudsonian zones of Quebec the unusual dryness had if anything a beneficial effect, and collecting was unusually productive. In all parts of the region southern species, and certain normally rare ones, were present in unusual numbers.

Since only about ten per cent of the Society members in the area reported, the general pattern cannot be given in greater detail. Three species appear to have been present in much larger numbers than usual over a wide area: Danaus plexippus, Vanessa cardui, and Phlegethontius quinquemaculatus. Unfortunately, few definite dates are available for D. plexippus. The first record for the Area is Barnstable, Mass., Apr. 30; it was seen at Ithaca, N.Y., June 4; fresh specimens in moderate numbers

appeared suddenly in the Montreal, Que., region about June 9. The species was abundant in all areas throughout the summer, and lingered in the autumn at St. Annes, Que., to Oct. 10, at Rochester, N.Y., to Oct. 30, at Ithaca, N.Y., to Nov. 8, and in Connecticut to Nov. 15. Little was reported concerning the progress of the populations throughout the summer; larvae taken at Shawinigan Falls, Que., in June yielded adults in the first three days of July. In the Montreal area no definite fall migration or directional movement was seen, although the species was common and was carefully watched; the species was increasing in numbers at Rochester in early September, and a definite migration was seen at Ithaca on Sept. 18; the peak of the migration in Connecticut was on Sept. 24, and a heavy migration was reported at Cape May, N.J., on Oct. 1. It is noteworthy that all definite migratory movements were at dates considerably before the last reported occurrence of the species in the locality. The population appears to have been above normal everywhere, and dense populations extended farther north than is usual; in the Province of Quebec, where the species is usually scarce, it was very numerous in 1949, as far north as the Shawinigan Falls region, i.e., to about the limit of the general occurrence of milkweed; the first appearance was about a month earlier than normal; the species was not seen in the Laurentide Park in August.

Vanessa cardui was abundant everywhere; it was common in Connecticut by April 25 (probably overwintered); a frayed specimen was seen in Augusta, Me., on May 15 and another on June 3; a few fairly

fresh specimens were seen at Ste. Anne de Bellevue, Que., in late May. A massive generation appearing in late June or early July was reported from almost all localities, and in most localities abundance continued almost unaltered until late summer or early autumn; the larval progeny of this generation were much in evidence, and damage to hollyhock was reported from several places. At Shawinigan Falls many larvae were seen in late July, also many empty larval nests, but few pupae, and the species seems to have become scarce in August, although it remained common in the Montreal and Eastern Townships regions. Badly worn specimens were present in large numbers in the Laurentide Park in the first half of August.

Phlegethontius quinquemaculatus was common farther north than usual, being rather abundant in the southern part of the Province of Quebec, where in most years it is rare or absent. Captures in the Ste. Anne de Bellevue area are from June 12 to July 3; larvae were abundant enough to be of economic importance on tobacco and tomato, becoming full grown and pupating about the end of July; a definite second generation emerged in September and October, a most unusual occurrence in this region. The species is also reported as being unusually common in central Maine.

The remainder of the summary is given by regions.

NEW JERSEY (Ehrlich). Early season in Essex Co. normal: Nymphalis antiopa mid-March; Colias philodice first week of April; Pieris rapae and Lycaenopsis pseudargiolus 2nd week of April. Fauna much below normal by June, with Papilio ajax, Lethe eurydice, Polygonia interrogationis, Vanessa atalanta, and Poanes zabulon, as well as other species, very scarce. Most species scarce in July, but unusual records were Strymon edwardsii, July 2, Achalarus lycidas, July 3. In August and September general scarcity continued, such species as Eurema lisa, Colias philodice, Papilio cressphontes, and Euptoieta claudia markedly below normal. Collecting in special localities was, however, productive in July.

At Springdale and Lake Lackawanna on July 9, the following were found: Poanes massasoit; Boloria selene; B. toddi; Minois alope; Lethe eurydice and portlandia; Polygonia comma; Speyeria cybele and idalia; Atrytone pontiac; Strymon liparops; Mitoura damon; Lycaenopsis pseudargiolus. On July 16 the following additional species were present: Calephelis borealis; Lycaena hypophleas; Papilio troilus, glaucus, and philenor; Wallengrenia otho; and Polites peckius.

At Lakehurst on July 10, Lycaena epixanthe was taken in bad weather, but Euptychia areolata was not seen; Erynnis spp. were common and P. philenor was taken; by July 19 the cranberry bogs had been drained, and L. epixanthe was absent, but two Atrytone ruricola were taken.

PENNSYLVANIA. Philadelphia (Ehrlich): April 26-30, fresh Anthocharis midea were common in a restricted locality; general fauna about normal.

Lancaster Co. (Ehle). Butterflies were in general above normal abundance, but appeared at about the usual times. In abnormally large numbers were: Asterocampa celtis; Vanessa atalanta (3rd week July);

V. virginensis (latter half Aug.); Polygonia interrogationis, autumn brood (Oct.); P. comma at same time; Euphydryas phaeton (mid-June); Strymon melinus (late Aug.); Polites verna (June 19-25); Atrytone pontiac (late June); Eurema lisa was unusually scarce. Euptoieta claudia somewhat scarcer than usual. Species taken for the first time by Ehle in Lancaster Co. were: Incisalia augustus; Pyrgus centaureae; Hesperia sassacus; H. metea; Polites manataqua; Panoquina ocola. Taken for the first time since 1942 were: Pieris protodice; Hylephila phyleus; since 1943: Papilio cressphontes.

NEW YORK. Horseheads and Sardinia regions (Rupert). Early spring collecting about normal; about June 20 many species appeared which normally occur in July, among them (June 20-30): Catocala crataegi and mira; Agroperina dubitans; Apamea americana; Eugonobapta nivosaria; etc. Apicia confusaria appeared in mid-June, about 2 weeks ahead of normal. In July and August moths appeared in normal numbers at bait along the Cattaraugus, south of Sardinia, but elsewhere in the neighborhoods of Sardinia, Horseheads, and Ithaca, bait was unproductive, even in normally good spots. In the Cattaraugus Valley Euparthenos nubilis, Acronicta connecta, Catocala crataegi, C. mira, C. parta, C. meskei, Calpe canadensis, and many other species were particularly common. In the same locality, Lethe portlandia was abnormally abundant, and congregated in hundreds on bait lines, flying until well after dusk. Autumn collecting was poor, as for several years past; Harpaglaea sericea and Stannodes gibbicostata were, however, reasonably abundant, the latter for the first time in several years.

Ithaca region (Keji). The following are sight records of butterflies: Papilio ajax, May 2 - Oct. 9, 28 days earlier than 1948; P. glaucus, May 18 to July 27, 25 days earlier than 1948; Papilio troilus, June 21 to Aug. 25, seen on 17 days, as against none in 1948; Pieris rapae, April 20 to Oct. 30; Colias eurytheme, June 2 to Nov. 15, more numerous than in 1948, and appeared 22 days earlier; maximum abundance after mid-Oct.; C. philodice, May 3 to Nov. 15, 23 days earlier than in 1948, very common; Lethe portlandia, July 12 (1 specimen); Minois alope alope, Aug. 9; M. alope nephele, June 28 and (worn) July 19; Euptychia eurytus, June 1 and July 12; Speyeria cybele, June 12 to Sept. 12, about a month ahead of 1948; Boloria toddi, June 20 to Sept. 19, seen ovipositing on Sept. 19; Euphydryas phaeton, June 4 to July 3, not seen in 1948; Phyciodes tharos, May 13 to Oct. 16, commoner from July on, over a month ahead of 1948; Polygonia interrogationis, July 19 to Sept. 13, much scarcer than in 1948 and about 6 weeks later; Vanessa atalanta, May 22 to July 21; Limenitis arthemis, June 6-19; L. archippus, June 24 to July 29; Lycaena thoe, June 24 to July 29, fairly common; L. hypophleas, June 4 to Oct. 16, seen fewer days than thoe; Everes comyntas, June 11 to Sept. 4, commoner and about a month earlier than in 1948; Lycaenopsis pseudargiolus, May 4 to July 30, scarce; Proteides clarus, June 21 to Aug. 15; Pyrgus communis, July 24 to Oct. 10, commoner than in 1948; Pholisora catullus, July 4 to Sept. 18; Ancylorhynchus numitor, May 24 to Sept. 5.

Rochester region (Kimball). All common butterflies were scarce, as well as the following normally common moths: Agrotis ypsilon; Lacinipolia renigera;

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7. NORTHEAST - cont.

Orthodes and Graphiphora spp.; Harpaglaea sericea; Eucirrhoedia pampina; Agroperina dubitans; Septis arctica; Apamea americana; Amphipyra pyramidoides; Arzama obliqua; Erastria spp.; Catocala amatrix; Ichthyura inclusa; Symmerista albifrons; Heterocampa biundata; Alsophila pomataria; Coryphista meadi; Lygus diversilineata; Semiothisa gnophosaria; Anacamptodes pampinaria; Phigalia titea; Eugonobapta nivosaria; Xanthotype urticaria; Homochlodes fritillaria; Hyperetis amicaria. Unusually abundant were: Apantesis nais; Morrisonia evicta and confusa.

CONNECTICUT. New Haven region (Remingtons and Bellinger). After cool weather in the early spring, collecting reached normal levels; the extreme drought extended from mid-June to mid-August, but with little evident effect on the fauna. Representative captures and dates are: Phigalia titea, Mar. 28; Lycaenopsis pseudargiolus, Apr. 10 - May 8 (in great numbers about Apr. 20, larvae very numerous later, of 200 taken at random 30% were diseased and 10% parasitized); Erynnis brizo, Apr. 11 to May 7; Pieris rapae, Apr. 11; Mitoura damon, Apr. 11, becoming numerous by Apr. 24; Ectropis crepuscularia, Melanolophia canadaria, Abbotana clemaria, Apr. 14; Anthocharis midea, Apr. 21-May 15; Erynnis juvenalis first week of May; Incisalia augustus, Apr. 30, and I. nippon, May 8; Strymon melinus, 1st generation scarce, about Apr. 30, but August generation extremely abundant; Papilio glaucus, Apr. 30, abundant to late June; Isturgia truncataria, common in bog May 1; Lycaena hypophlaea common May-June, but autumn generation scarce, in contrast to 1948 abundance; Boloria toddi fairly numerous May 6 - Sept. 17; B. selene locally common June 11-18 and early September only; the following spp. common 1st three weeks of June: Asterocampa celtis; Limenitis astyanax; Thorybes pylades; I. bathyllus; Phyciodes nycteis; Euphydryas phaeton; Strymon falacer; S. edwardsii. For the 2nd successive year a Bucculatrix breeding on Quercus was almost in plague abundance, countless millions spinning down in mid-June to pupate. Melitaea harrisii appeared June 14; Speyeria idalia late Aug.-Sept., common; Hesperia leonardus abundant Sept. 3-11; autumn generation of Eurema lisa scarcer than in 1948. The following species are recorded as abundant, without dates: Everes comyntas; Pholisora catullus; Phyciodes tharos; Papilio troilus; Colias eurytheme; C. philodice; Limenitis archippus; Polites themistocles, mytic, and peckius; Euptychia euryta; Ancyloxypha numitor; Vanessa atalanta; V. virginensis; Speyeria cybele; Proteides clarus; Poanes hobomok. Very unusual dates or species were: Eurema lisa, June 11; Lethe eurydice, June 18; L. portlandia, June 23; Speyeria aphrodite, Sept. 23; Lycaena thoe, Sept. 11 and 17; Pieris protodice, Oct. 8 and 10; Hylephila phyleus, Oct. 17; Pyrgus communis, Oct. 10. Larvae of Phlegethontius quinque-maculatus were common and P. sextus rare on Physalis in Sept., with surprising abundance of black form larvae of quinquemaculatus. A fresh Celerio lineata was at light Sept. 25. Erannis tiliaria abundant Oct. 28 - Nov. 23; Alsophila pomataria, scarce in Nov., becoming common in Dec., taken to Dec. 21.

Putman (Klots). Collecting probably below normal in August.

MASSACHUSETTS. Vicinity of Barnstable, Cape Cod (Kimball). Adverse influences were drought, continuing to late August, and the spraying of the entire Cape from the air with DDT in late May; collecting was reasonably good in early July and in Sept.-Oct.; response to bait was poor; many species which might have been expected by analogy with previous experience on Nantucket and Martha's Vineyard were absent. The following were common: Erynnis brizo and juvenalis (late Apr.); Ancyloxypha numitor; Phlegethontius sextus; Lapara bombycoides; Smerinthus spp.; Anisota stigma; Crambidia pallida (abundant); Halisidota tessellaris; Hyphantria textor; Feltia ducens; Anomogyna spp.; Protolampra brunneicollis; Papaipema marginidens; Schinia arcigera and brevis; Cryphia spp.; Marathyssa inficta; Paectes oculatrix; Autographa falcifera and brassicae; Doryodes spadaria (very abundant, late June to mid-Sept.); Anticarsia gemmatilis; Gabara bipuncta; Bleptina caradrinalis; Datana drexeli; Tolyva laricia; Synchlora aerata; Metasloopsis ossularia; Scopula enucleata; Pleuroprucha insularia; Pernoplitota obstipata; Euphyia centrostrigaria; Semiothisa spp.; Apiccia confusaria; Lagoa orisata; Hymenia spp. Nomophila noctuella; Loxostege helvialis; Schoenobius spp.; Crambus spp.; and many Phycitinae. Particularly interesting captures were: Magasa orbifera (3); Cleora manitoba (2); and Topeutis perstrialis.

Vicinity of Waltham (Rogers). Papilio ajax, Apr. 12; Erynnis horatius, (worn), and Incisalia irus, Apr. 27; I. nippon ♀, Apr. 30 (unusually early dates). I. augustus was abnormally scarce, perhaps as a result of failure of 1948 wild blueberry crop. Strymon spp., Speyeria, and other midsummer butterflies were far below normal abundance. A colony of Achalarus lycidas, an unusual species in this area, was in full emergence by June 10, as compared with a late June emergence in a previous year at Johnstown, R.I.

The Johnstons reported an exceptionally poor year for most Rhopalocera, with Lycaena hypophlaea almost absent, in contrast to 1948 abundance. Vanessa cardui, however, was very common around Boston.

NEW HAMPSHIRE (Gerould & Gottschalk). Around Hanover Danaus plexippus was unusually abundant. In contrast, Colias were decidedly below average, with philodice no more evident than the few eurytheme or hybrids. Near Jefferson Vanessa cardui was very common Aug. 13-15. Oeneis jutta was said to have been chased into N.H. from the newly discovered colony in southern Maine and thus becomes a new State record.

VERMONT. Central region (Klots). A number of Erora laeta taken in two localities where careful search did not disclose it in 1948 or in the late 1930's; dates June 4-15. During the same period and on July 15-16 other butterflies were about as usual. Possible exceptions: Melitaea harrisii, a dense colony freshly emerged, June 4-15; Papilio ajax not seen in a locality where abundant in late May, 1948; 1st gen. P. glaucus perhaps commoner than usual.

MAINE (Brower). Cool, cloudy spring, followed by drought in July. Numbers of most species much depressed. The following first dates of capture are reported (unless otherwise specified, the locality is Augusta): Colias philodice, Apr. 30, (very scarce

in Sept., none June-Aug.); Pieris rapae, May 5; Nymphalis antiopa, May 7; Papilio ajax, May 11; Lycaenopsis pseudargiolus (unusually scarce) and Strymon melinus (unusually common) May 14; Incisalia nippon (to June 6); Feniseca tarquinius (some worn); Boloria toddi, May 17; Phyciodes tharos (scarce all year) May 18; Papilio glaucus, Liberty, May 24; Boloria selene, Bar Harbor, May 26; Lycaena hypophlaeas (unusually scarce) and Poanes hobomok, May 30; Hesperia sassacus and Atrytone bimacula, June 2; A. ruricola, June 3; Thorybes pylades, June 4; Polites themistocles, June 13; Limenitis arthemis, Liberty, June 12; Euphydryas phaeton, June 19; Proteides clarus and Amblyscirtes hegon, June 23; Ancyloxypha numitor, June 25 (unusually common); Lycaena thoe, June 30; Letha eurydice, July 2; Minois alope, July 9; Speyeria cybele, July 19; Nymphalis antiopa, Sept. 12; Colias eurytheme, Belgrade, Oct. 8, VERY RARE; Nymphalis i-album, one Oct. 11 (no others). Many moths were recorded, of which the following are of exceptional interest: Septis commoda (new State record), Ashland, July 18; Legna perditalis (first definite State record), Princeton, July 18; Lobophora nivigerata, Mt. Katahdin, July 25; Heliomata cycladata (first State record), Gardiner, June 4. Unusually common: Phlegethontius 5-maculata; Hyppa xylinoides; Rachela bruceata; Coryphista meadii; Eudule mendica.

NOVA SCOTIA (Ferguson). Butterflies were generally common, moths in tremendous and unusual abundance. Incisalia augustus, polios, nippon, and Lycaenopsis pseudargiolus, Mt. Uniacke, May 8, and Aldershot, May 9; Oeneis jutta, Mt. Uniacke, June 3; Papilio brevicauda at 5 localities in Cape Breton in early July; only 1 specimen of Plebeius argyrogonon at Baddeck, but common elsewhere in Cape Breton, and also in Halifax Co.; Speyeria spp. were common in July, in contrast to 1948 scarcity; worn Boloria titania (= "chariclea") at Parrsboro, Aug. 12; Vanessa cardui and virginiensis common in late summer after several years' absence; Polygonia and Nymphalis remained scarce. Twenty-two species of macroheterocera were added to the Province list, some of which were: Celama triquetra; Agrotis mollis; Septis vulgaris; S. apamiformis; Elaphria georgei; Pleuroprucha insularia; Semiothisa gnophosaria; Anacamptodes vellivolata; Metarranthia (undetermined sp.); Catocala coccinata; Andropolia contacta; and Septis plutonia. Oporophtera brumata appeared for the first time in North America; it is established in a considerable area near Halifax, and has probably actually been present for some time; it is a pest of fruit, shade, and forest trees in Europe, and its introduction should be viewed with concern. Other interesting captures were: Homoglaea hircina, April, Metalepsis fishi, May 1, both from near Halifax; Catocala commbialis, Coldbrook and Annapolis, July 23-26; Germa cora, Marathyssa inficita, and numbers of Cryphia pervertens and Paectes oculatrix from the Annapolis Valley; Gluphisia avimacula in numbers at Centreville; Notodonta simplaria, Centreville, June 4; Hemaris gracilis, Southampton, Aug. 6.

NEW BRUNSWICK. Southeastern portion (Ferguson). Boloria titania (= "chariclea"), Dorchester, Aug. 5-11; Polygonia progne and faunus same locality and dates; also Sphinx kalmiae, Rhodophora florida, etc.; Strymon acadica, near Moncton, early August.

Northern portion and Gaspé region of Quebec (Ferguson and Klots). In latter half of July Boloria selene was abundant and worn; Plebeius saepiolus was common; Boloria titania was abnormally scarce on the Cascadia road, in contrast to 1948. At Bathurst, Aug. 2-4, Lycaena dorcas could be taken at the rate of 100 per hour; Coenonympha inornata was absent. A few miles to the south, Boloria titania was abundant; also present were Colias interior, Speyeria atlantis, Nymphalis milberti, Boloria selene, and single Polygonia gracilis and Strymon liparops. Autographa octoscripta and Hydrionema furcata were taken at light at Bathurst.

QUEBEC. Granby (Bro. Adelphé). Butterflies were abundant. Species taken in Aug., in order of decreasing abundance: Vanessa cardui, Danaus plexippus, Speyeria aphrodite (mostly fresh), Colias eurytheme (from Aug. 5), Boloria selene (1 worn specimen Aug. 8, numerous fresh ones after Aug. 16), Lycaena hypophlaeas (common after Aug. 9), Speyeria cybele (up to Aug. 16, mostly worn), Vanessa virginiensis (from Aug. 6 on), Phyciodes tharos (from Aug. 8 on, mostly after Aug. 13), Colias philodice, Minois alope (worn) and Boloria toddi (equal), Limenitis archippus, Nymphalis milberti. About 1200 moths were taken in the same period, including several melanic Septis arctica.

Montreal region (Gray, Munroe, Sheppard). Lepidoptera were much less abundant in open areas than in 1947 or 1948, but were normally abundant in low-lying, wooded places. Some representative dates are: Vanessa atalanta, Apr. 3, present in moderate numbers through the spring; Lithophane unimoda, Apr. 13, new generation abundant in Oct.; Caenurgina sp., abundant May 5; Zale sp., May 7; Diacrisia virginiaca, May 14 to Aug., without evident break; Xanthorhoe lacustrata and Simyra henrici, May 16; Papilio glaucus, May 17 (about 3 weeks ahead of normal); Gabarasa ambigua, June 1-5; Autographa falcifera, June 2-9, late July; Phlegethontius 5-maculatus, June 12 to July 3 and Sept. 2 to 27; Euclidina cuspidata, June 3-19; Phragmatobia fuliginosa, June 4 and July 17-29; Hyphantria textor, June 4-13; Chytolita morbidalis, June 5-29; Isia isabella, June 6-24; Gluphisia septentrionalis, June 8-13 and July 29; Dyspteris abortivaris, common about June 10; Euchlaena serrata, June 9 to July 15; Lacinipolia lorea, June 9-21; Minois alope, June 11 to July 16, common; Arzama obliqua, June 12; Habrosyne gloriosa, June 13-21, common, a second generation late in July; Nymphula obscuralis, June 18-26, common; Prioxystus robiniae, about June 19, common; Plusiodonta compressipalpis, June 19 and July 27-29, common; Parallelia bistriaris, June 20 and Aug. 2-9; Schoenobius sp., June 22; Septis arctica, June 26-29 (unusually early); Lycaenopsis pseudargiolus, very common from June 28 to July 16 and from Aug. 12 to 22, the spring generation was, however, scarce; Epizeuxis lubricalis, July 2 to Aug. 3; Letha eurydice, common in early July; Pieris rapae, scarce in spring, but abundant July 4 to Oct. 10; Papilio ajax, last. gen. scarce, but 2nd gen. common July 16 to Aug. 28; Colias eurytheme, July 16 to Nov. 2, scarcer than philodice until Oct., when it became more abundant; Colias philodice, July 16 to Nov. 2; Crymodes devastatrix, July 16 to Aug. 18, very common; Polygonia interrogationis, July 20 to

FIELD SEASON SUMMARY 7. NORTHEAST - cont.

Aug.16, common (usually rare or absent in this region); Catocala crataegi, July 25 to Aug.9, common and rubbed; C. unijuga, July 25 and Aug.2; Peridroma margaritosa, Aug.12-23, Oct.6-16, very common; Catocala cerogama, July 30 to Aug.4, common, a melanic taken; Amphipyra pyramidoides and A. glabella, both common about July 30; Agroperina helva, July 30 to Aug.5, common; Vanessa virginiensis, July 31 to Sept.7, common; Everes comyntas, Aug.2 to Sept.11, common; Catocala parta, Aug.2 to 4, a melanic taken; C. concumbens, Aug.2-31, the most numerous species of the genus; Euxoa messoria, very common in Aug. (in contrast to 1947 and 1948); Leucania unipuncta, Aug.2 to Oct. 10, extremely abundant, comprising 90% of the specimens on Professor Gray's bait line; Ancylomypha numitor, common Aug.7-10; Eurois occulta, Aug.12-23, very common; Speyeria cybele, a male on Aug.28, an unusually late date; Nymphalis j-album, Sept.2; Lithomia solidaginis, Sept.11; Xanthia lutea, Sept.11-21; Nymphalis antiopa, Sept.11; Xylena nupera, Oct.11; Ctenucha virginica, Oct.27 (an unusual date); Erannis tiliaria, common about Oct.29; Oporophtera bruceata, Oct.29 to Nov.16. Unusual records were: Deidamia inscriptum, St. Anne de Bellevue, April 20; Strymon melinus, St. Anne de Bellevue, Aug.14, ? new record for the Province; Anticarsia gemmatilis, Oct.11; (all Professor Gray). Sheppard records a massive flight of Acentropus niveus at Montreal, Aug.6; over 100 specimens were taken at light at his home on that night, and many more were seen; none were seen on the following night, and the species did not reappear; this locality is about three miles from the nearest likely breeding ground.

Montebello region, early July (Munroe). Lepidoptera were very numerous; small quadridid noctuids

were abundant in the daytime in undergrowth of rich deciduous woods. No specific records available.

Mont Tremblant region, late June (Munroe). Lepidoptera were abundant, the usual run of seasonal species being present. The most common diurnals were Papilio glaucus (in expected numbers) and Limenitis arthemis (in massive and unusual abundance). Danaus plexippus was also numerous at this time.

Shawinigan Falls region, latter half of July (Munroe). Lepidoptera were in at least normal abundance, with species at about normal dates. Euxoa spp., esp. ochrogaster, were more common than for the past three years, though far from maximum abundance. Small, pale brown coleophorids were very numerous.

Chateau Beaumont region, Laurentide Park, early August (Munroe). Lepidoptera were very abundant, as is the rule in this area. The most common species of diurnals were Boloria titania (= "chariclea") (swarming everywhere in the dwarf birch-caribou moss areas), Plebeius argyrognomon, Colias interior, Pieris rapae, Polygona faunus, and Vanessa cardui, the last in shockingly worn condition. This part of the Park, which has not been collected previously, is at an altitude of between 2500 and 3000 feet, and has vegetation of a Hudsonian facies, although Dr. Yves Desmarais states that the climax appears to be Canadian. Moths were very abundant, especially a number of species of Tortricoides. One Coenonympha inornata was taken, a new record for the Park.

Contributors: Bro. Adelphé; P.F. Bellinger; A.E. Brower; G. Ehle; P.R. Ehrlich; D.C. Ferguson; J.H. Gerould; C.W. Gottschalk; W.M. Johnston; J.A. Keji; C.P. Kimball; A.B. Klots; C.L. & J.E. Remington; W.P. Rogers; L.R. Rupert.

8. FAR NORTH - ALASKA TO LABRADOR

by T.N. Freeman
Ottawa, Ontario

It was pointed out in the Summary for this region last year that season to season summaries for any one locality are usually impossible because those areas are not visited more than once. However, the following notes may be of general interest.

The lepidopterous highlight of this area undoubtedly was the widespread occurrence and unprecedented abundance of hordes of Vanessa cardui from the southern tip of James Bay north to Port Harrison on the barren lands of the east coast of Hudson's Bay. It was also abundant at Churchill and according to Dr. Gottschalk a ♀ was found at Chesterfield Inlet, Keewatin, N.W.T., on July 27. It was also abundant in Newfoundland and when we consider that this species cannot overwinter in Canada, except perhaps in the extreme southern portion of Ontario, its northern migrations extended for at least 1000 miles. The following are some general notes pertaining to specific localities.

DAWSON, YUKON TERRITORY

Paul F. Bruggemann furnished the following remarks on this locality. With some exceptions, Lepidoptera were few in individuals of any one species. This may have been due to the unusually wet season. It was noted that many of the species which are common in the northern Canadian prairie region, were also taken at Dawson. Papilio glaucus was quite abundant below 3000 feet elevation, above which Papilio machaon alaska was fairly abundant and ovipositing on Artemisia arctica.

NORMAN WELLS, N.W.T.

This locality approximately coincides with Kirby's old type locality, "Lat. 66". In general, the lepidopterous fauna is mainly characteristic of that of the coniferous forest zone, with a few arctic intrusions. Colias and Boloria were the most abundant

in number of individuals although species were few. The genera represented were Coenonympha, Limenitis, Phycodes, Nymphalis, Anthocharis, Pieris, Lycaena, and Lycaenopsis.

YELLOWKNIFE, N.W.T.

Yellowknife is on the North Arm of Great Slave Lake. The lepidopterous components of the fauna are those indigenous to the coniferous zone plus a few arctic intrusions. Euchloe ausonides, Pieris napi, Colias christina, Oeneis jutta, and O. chryxus caryi were the most abundant butterflies.

MOOSE FACTORY, ONTARIO

This locality is situated at the southern end of James Bay. The survey parties were there only for a short time en route to stations along the west coast of James and Hudson's Bay. Pyrausta nubilalis and Celerio gallii were noteworthy captures. Leucania unipuncta was abundant at light on 11 September.

RUPERT HOUSE, QUEBEC

Inclement weather along the whole western coast of James and Hudson's Bays reduced the collecting. Papilio machaon was taken and verifies Holland's record for Rupert House. Vanessa cardui was abundant. One Danaus plexippus was captured. This is well south of the tree limit; no arctic species was seen.

GREAT WHALE RIVER, QUEBEC

This locality lies in the Transition Zone and the Lepidoptera consist of arctic and coniferous zone species. Oeneis taygete was the most abundant and all other indigenous species were rare. The intrusion of the southern Vanessa cardui was striking. As many as 200 specimens could be seen at one time, in late June. The larvae occurred literally in hundreds of thousands, feeding on yarrow and tansy, and many of the larvae were eaten by Pipits and Horned Larks. Many fell from the food-plants and became trapped in sand-pits. The larvae pupated in mid-August and began to emerge at the end of the month. Pupae sent to Ottawa emerged until September 20. Peridroma margaritosa and Nomophila noctuella were significant moth records for this locality.

PORT HARRISON, QUEBEC

This locality, well within the barrens, had the usual Boloria, Oeneis, Colias, and Erebia in limited numbers. Vanessa cardui arrived in late July but apparently did not find a suitable food plant.

NEWFOUNDLAND

In the western part Boloria and Oeneis were absent, Colias scarce, Blues and Coppers abundant in certain habitats. In the eastern part Pieris rapae was abundant in an area deep in the woods and cleared of timber thirteen years ago. Papilio glaucus and P. brevicauda were also numerous. Danaus plexippus occurred at St. Johns. Coenonympha inornata and our old friend Vanessa cardui were abundant generally in Newfoundland.

Contributors: P.F. Bruggemann; C.W. Gottschalk.

Mr. Field, now an Associate Curator of Insects at the United States National Museum, wrote in the preface to his Manual: "Many students of nature would like to be able to determine their own finds. It was with this in mind that the simple faunal list was enlarged into a manual with complete keys to the various families, genera and species. The intention has been to eliminate from the manual as much technical language as possible, in order to make it more easily usable to younger and inexperienced collectors. ... A rather lengthy introduction has been included to prepare the beginning student for an intelligent use of the subject right at the start, and also perhaps to arouse his interest. ... References are placed in the footnotes so that the student who may find some particular interest in the several subjects discussed can make further studies."

The first section succeeds exceptionally well in introducing to the untrained enthusiast the serious study of butterflies, with discussions of nomenclature, classification, the structure of each life history stage, migration, butterfly senses, and other subjects. A serious deficiency here is the lack of a biologically tenable, modern discussion of subspecies and of individual and seasonal variants. That such an omission would be unlikely today emphasizes the recentness and yet tremendous impact of the superb theoretical treatments of the "New Systematics" by Mayr, Huxley, Dobzhansky, Simpson, and many others. In the body of the Manual the descriptions, all of which appear to be newly prepared, are simple and lucid. For ease in handling the necessary technical terms there is an extensive glossary.

A distinctive feature of Field's book is the regular use of keys for identification of superfamilies, families, genera, and species, as well as a few to subfamilies and tribes. How most butterfly-book writers have so long neglected the invaluable technique of identification keys is a curiosity.

The Manual includes detailed characterizations of the adults, pupae, and larvae of all higher groups. Under each species in addition to the description, there are notes on distribution, flight periods in Kansas, host plants, and references to figures in the standard books by J.H. Comstock, Holland, Clark, and J.A. Comstock. A real disappointment to the reviewer was the large amount of space devoted to aberrations and forms, a disappointment heightened by the lack of genetical interpretation of these phenomena which are essentially the province of genetics rather than taxonomy and nomenclature.

These shortcomings are perhaps the product of the date of preparation and could be raised equally for virtually all other Lepidoptera manuals preceding this one by Field. Its originality and thoroughness make this a book valuable for frequent reference for the specialist as well as the collector for whom it was intended.

C.L. Remington

*Bull. Univ. Kansas, vol. 39, no 10: 327 pp., 2 pls. 1938.

AVAILABLE NOW FREE OF CHARGE. Merely write:
Prof. C.D. Michener, Dept. of Entomology, University of Kansas, Lawrence, Kansas.

ANNUAL MEETINGS OF A.A.A.S. AND ENTOMOLOGICAL SOCIETY OF AMERICA

The 1949 meetings of the E.S.A. were held at Tampa, Florida, December 13-16. As usual, there were papers on the program of lepidopterological interest, primarily in a symposium on Entomology and Zoogeography. Dr. Charles D. Michener discussed "Geographical Isolation and Speciation", and Dr. Alexander B. Klots presented a paper on "Circumpolar and Alpine Distribution of Butterflies."

University duties kept the writer from attending the E.S.A. meetings at such inconvenient dates, but the societies meeting with the American Association for the Advancement of Science had several papers of exceptional interest this year. The A.A.A.S. met in New York City December 26-31, and readers of the Lep. News may be interested in some selections from the program.

Of outstanding interest was a symposium on "The Role of the South Atlantic Basin in Biogeography and Evolution with Special Emphasis on the History of South America During the Mesozoic Era." It was arranged by the thriving new Society for the Study of Evolution and was presided over by Dr. Ernst Mayr. Of course, the central theme was the Wegenerian Hypothesis of Continental Drift (Wegener tried to show that South America and Africa, as well as other land masses, had once been connected along the sides now forming the shores of the South Atlantic Ocean and that the continents had drifted apart rather rapidly during Mesozoic times). Nine formal papers and about the same number of arranged discussion papers were read by a galaxy of noted physical geologists, paleontologists, botanists, entomologists, and vertebrate zoologists. Thus, fresh, authoritative approaches to the problem were made from very many points of view. While no one officially attempted to arrive at a conclusion after the papers and discussion, the writer went away thoroughly convinced that there was hardly a shred left to support those who accept the essentials of the Wegenerian hypothesis and that virtually conclusive evidence was presented, particularly by the geologists, that large-scale Continental Drift did not occur. Also, apparently a trans-Atlantic land-bridge eastward from Brazil to Africa has little or no support today and only passing reference was made to such a bridge. Incidentally, few if any Lepidoptera could be expected to throw much light on Drift or land-bridges, since almost any modern Lepidoptera occurrence in South America and Africa could be explained on the basis of transportation of pioneers by wing and wind.

Two papers on Lepidoptera were listed in the Evolution program, one by Prof. Ernst Caspari on "Effect of two alleles occurring in natural populations on viability in Ephestia" being read by title only and presumably appearing in print soon. The other, by the writer, was on "Evidence on species separation in the lepidopterous genus Colias", and known facts were reviewed, in combination with new ones, to show that aurytheme and philodice are separate, frequently hybridizing species of Colias.

Prof. Caspari also had a paper on Lepidoptera on the program of the Genetics Society of America,

entitled "Serological Differences between a⁺a⁺ and aa Ephestia."

The 1950 meetings will be held in Cleveland, Ohio, after Christmas, but a number of biological societies will probably meet separately in Columbus, Ohio, in September. The plans of the E.S.A. are not yet known to the writer.

C.L. Remington



PERSONALIA

Prof. RENÉ LICHY, Caracas, Venezuela, returned this fall from an extended trip to Europe. He wrote enthusiastically of the kind attention he received, particularly from Mr. N.D. Riley, Dr. Karl Jordan, and MM. J. Bourgogne and P. Viette, during research visits to the British Museum, the Tring Museum, and the Muséum National d'Histoire Naturelle in Paris. He was able to examine to his satisfaction the Felder types of Eurema and of Amblypterus tigrina.

ARTHUR D. HALL, a Charter Member of the Lepidopterists' Society, died in Camp Hill Veterans Hospital, Halifax, Nova Scotia, on 31 December 1949. He was 78 years old. Born in England, Mr. Hall emigrated to Canada just after the First World War and lived for a time in Ontario before moving to Great Village, Nova Scotia, his home for several years. He was a keen moth collector in England as well as in Ontario and Nova Scotia. The Hall collection and small library were bequeathed to Mr. H.G. Payne, Provincial Apiarist, Truro, N.S.

CLAUDE I. SMITH, a Charter and Sustaining Member of the Lepidopterists' Society, was drowned in a fishing accident in San Francisco, California, 4 November 1949. Mr. Smith, only 27 years old at the time of the tragedy, was a student of entomology at the University of California and was working there on a revision of the noctuid genus Annaphila. He was married and the father of two small boys. Mrs. Smith turned over to the University his notable collection of western North American moths.

The Autumn, 1949, issue of American Scientist reports that KENT H. WILSON, studying at the University of Idaho, received a substantial grant "to aid in a study of the two species of the Glaucus group, Papilio glaucus Linné and Papilio rutulus Lucas."

Prof. K.J. HAYWARD, who has returned to Argentina from his lengthy stay in England, notified us that the second volume on the Hesperidae of Argentina was in the printers' hands in October. As a result of his very successful trip, he now has assembled a complete synonymic list of the Argentine butterflies, with 748 species and subspecies.

Dr. EUGENE MUNROE has accepted a position with the Systematic Entomology Unit, Division of Entomology, of the Canadian Department of Agriculture, in Ottawa. This Unit apparently now has the largest staff of lepidopterists in the Western Hemisphere. It long was a distinguished center for Lepidoptera research with the presence of Dr. J.H. McDunnough, who retired from the Unit three years ago.

AN ECONOMICAL STORAGE-BOX

by P.H.H. Gray
Macdonald College, Quebec

A light (weight 2 lbs.) but strong storage-box for pinned insects can be made easily and at a very small cost, with the materials listed below and in the manner described. The boxes are in book-form. They measure 16" x 12", are 3 7/8" thick, and require 17" of shelf depth. Each will hold about 250 noctuid-sized moths, or about 100 of the *Nymphalis* type. One box requires the following materials, or pro rata as stated:

- 4 pieces 3/8" thick basswood, 1 3/4" x 16"
- 4 pieces 3/8" thick basswood, 1 3/4" x 11 1/4"
- 2 pieces box pasteboard 12" x 16", for covers
- 4 pieces liner pasteboard 11 1/4" x 15 1/4", for the pinning medium (see notes below)
- White paper to cover the liner
- 13 1/4" passepartout (picture-binding) 7/8" wide (or 3 1/2 rolls of 10 yards for 9 boxes)
- 3 tubes "Glyptal" Gen'l Purpose Cement for 9 boxes
- 1 tube "Duco" Household Cement for 9 boxes
- 20 small flat-headed nails, 5/8" long
- 16 small picture (French) nails, 7/8" long

I get the wood strips sawn for me in 4'1" lengths, and cut them to the box lengths, sanding all open ends. I have a squaring-up frame of flat strips of wood nailed to a 12" wide ironing board (retired household property!) to accommodate the 12" x 16" dimensions of the box. The two 16" and the two 11 1/4" basswood strips are "Glyptaled" at the ends and nailed together in the squaring up frame with two 7/8" nails at each butted corner.

A very sharp knife is needed to cut the pasteboard (you could have it cut at a factory). The 16" x 12" cover-pasteboard is then glyptaled onto the edges of the box-frame and tacked down with the 5/8" flat-headed nails, as far down as slightly to depress the edges or corners of the pasteboard. A duplicate of this makes the other half of the box.

A double layer of liner pasteboard is glyptaled into each half-box, spotting the adhesive only enough to hold the two pieces firmly. You can use the flat grey-coloured liner or corrugated pasteboard; the latter must be stuck together "hill-to-valley", the kind with the hills 3/8" apart. Heavy weights are needed to stick these together and to the cover. White paper is "ducoed" sporadically and weighted down on the liner. "Glyptal" seems to be too tough for pins 1 and 2 to penetrate. These two cements appear to contain amyl acetate; they repel psocids (book-lice) for at least six months. Glyptal is made by Canadian General Electric, Duco by Canadian Industries Ltd. Similar adhesives can be obtained under other names in other countries.

All open ends and edges are covered with passepartout folded over. The two half-boxes are now placed side to side, covers undermost, and a strip of passepartout stuck along the adjacent edges to form an inner hinge. When this is dry the two halves are folded together, closing the box; it is then placed on its front edge, and another strip of binding paper stuck along the back joint completes a double hinge. The box is now ready for use. You can add inner strips of basswood, to project on

three sides of one half, with the exposed edges rounded for half their depth, to make a closer fit. I do not add a hook or catch.

If the wood strips are less than 1 3/4" wide the pin heads protrude when the box lies open flat. Since specimens are pinned into both halves, you may have pin heads through your larger moths and butterflies if you use 1 1/2" wood.

It takes about two hours to make one box. You may save time but spend more money by having ready-cut pasteboard. These boxes are for the far-from-rich enthusiast. I made nine boxes last winter for about 85 cents each, the pasteboard costing nothing.



THE NOMENCLATURE CONTROVERSY

A group of taxonomists in Washington, D.C., has published a statement (*Science*, vol. 110: p. 595; 1949) about the much-discussed nomenclatural events at the 1948 international zoological congress. It is intended to remedy the fact that "the basic issues have not been sufficiently emphasized." (See *Lep. News* 3: pp. 19-20, 67). After the events are reviewed briefly, the statement is continued as follows:

"The following facts stand out as the basic issues: (1) the most momentous actions of a half-century in zoological nomenclature were taken at Paris without preliminary announcement, without the usual opportunities for consideration by zoologists in general, and without prior study and approval by the regular commissioners; (2) in many cases approval was given only "in principle" with no provision for review of the principles and with the actual wording left to a committee of jurists; (3) not only was no provision made for review of these principles, but no right was reserved for the regular commission, the international congress, or zoologists to accept or reject the final wording of the proposed revision or any of its parts before promulgation.

"It is clear that the program which produced these issues was created and fostered by the secretary of the commission, who no doubt believed that his actions were desirable and necessary to improve the nomenclatural situation. Nevertheless, shorn of all obfuscations regarding 'mandates from the congress,' dangers of delay, and similar assertions, the means taken to effect the ends are contrary to the principles and practices on which international cooperation in nomenclature was established and by which it has functioned for nearly half a century.

"Such actions strike at fundamentals. If they are allowed to stand, international cooperation in nomenclature will be a farce, the confidence upon which support of the commission has been based will be lost, and the accomplishments of years in the field of zoological nomenclature will be jeopardized.

"If confidence is to be maintained and international cooperation made secure, any plan for revision of the code must have widespread approval. Zoologists must be permitted to see any such proposals and express their reactions, the full commission must study all proposals, as well as the comments of zoologists, and pass judgment on them, and, if it still seems desirable to maintain the formality, the following International Congress of Zoology must formally approve the final draft."

BUTTERFLY REARING TECHNIQUES AND GLOVERIA CROSSES.- Last spring and summer, while persuading butterflies to oviposit in captivity, I was amazed how well the flower-pot-and-lamp system works. After failing to obtain eggs from two ♀♀ of Pieris beckeri Edw., which I carried home in small cardboard containers in the car, I decided that they had become too hot. I took a gallon thermos jug with ice cubes in it on my next collecting trip. I placed the ♀♀ in gauze-covered cartons that fit inside a tin can, which was suspended by a wire into the partially melted ice. The butterflies were quiet on the way home, and laid many eggs in captivity. This method has worked successfully on Melitaea wrightii Edw., M. gabbi Behr, Speyeria macaria Edw., S. callippe comstocki Gund., Phyciodes mylitta Edw., Limenitis lorquini Bdv., and Lycaena gorgon Bdv.; all laid numerous eggs. One S. callippe comstocki laid 190 eggs on dry violet leaves. The young larvae hatched, ate their egg shells, and went into hibernation immediately. The last of 32 L. lorquini larvae finished its hibernaculum December 1st.

Minois silvestris Edw. and Coenonympha californica West. & Hew., collected in our patio, refused to lay eggs with a 40-watt bulb over the flower pot but soon began to oviposit when I switched to a 25-watt bulb. After devouring their egg shells, the newly-hatched C. californica hibernated.

A Heterochroa bredowii californica Butl. laid only one egg. The larva is so different from L. lorquini that it doesn't seem reasonable to me to classify both species in the genus Limenitis as has been done in the recent revision.

During September numerous Gloveria gargamelle medusa Stkr. ♂♂ were attracted to ♀♀ in my house almost each day between 10 a.m. and 2 p.m. A ♂ medusa mated with a ♀ G. arizonensis Pack. and a ♀ medusa with a ♂ arizonensis. Both crosses produced infertile eggs.

William H. Evans, Sun Valley, Calif.

COCCON WITH TWO PUPAE.- In about one bushel of cocoons of Samia walkeri F. & F. collected in the city of New Haven late in January, one contained two pupae. The exterior of the cocoon was normally formed except for a slight constriction running half way around the middle. However, the silk seemed to be continuous and only one Ailanthus leaf was wrapped about the cocoon. On the inside the external depression became a smooth ridge encircling the cell, but it was not pronounced enough to separate the two pupae entirely, for the one in the upper part had partially crushed the other. Neither of the pupae was alive although one moth had half emerged from the upper one; the lower had never developed at all. Apparently it had been partly crushed just after its formation, before hardening of the pupal cuticle. Among the other cocoons several had a few threads in common or as many as five or six were found hanging from the same branch, but none of those examined had joined the cell as well as the silk. In order to do so the larvae would not only have had to choose the same precise place but start spinning at the same time. The fact that the two pupae are in an upright position with only one opening into the cocoon suggests that the two started spinning separate cocoons and that the lower one in an attempt to keep its exit open thrust aside the threads of the other, with a single cocoon resulting.

R.W. Pease, Jr., New Haven, Conn.

The IXth International Congress of Entomology will be held in Amsterdam, Netherlands, from August 17 to 24, 1951. (The VIIIth Congress was held in Stockholm, Sweden, in 1948). Entomologists contemplating the trip to Amsterdam will receive the application forms and programs when issued if they write: The Secretariate, c/o Physiologisch Laboratorium, 136 Rapenburgstraat, Amsterdam, Netherlands.

Prof. Ralph W. Macy, Reed College, Portland, Oregon, whose planned book on the biology of North American butterflies was reported some time ago in the Lep. News, now has a substantial portion of the manuscript completed. However, there is still very much information which he is eager to get and he has sent a letter to Society members listing the points of special interest which active field workers can in many instances provide. He is especially hopeful of obtaining numerous first quality photographs, both in black-and-white and color, of all stages in natural habitats. The publisher will pay generously for photographs accepted and full credit will be given. Since the Macy book is not primarily taxonomic, it will not conflict with other works in preparation, such as Prof. Klots' manual. It will instead be a companion volume to them. His work deserves the fullest immediate support.

Hugh B. Leech, curator at the California Academy of Sciences in San Francisco, has sent us a number of separates of two of his short papers on Lepidoptera. These are available on request from the Associate Editor of the Lep. News.

1. "The Occurrence of a Hollyhock-Seed Eater, Noctuella rufofascialis, at Vernon, British Columbia." (Proc. Ent. Soc. Brit. Columbia, 1949).
2. "Flights of Nymphalis californica Bdv. in British Columbia and Alberta in 1945." (Can. Ent., 1945).

Prof. Dr. HERMANN WEBER, the celebrated German entomologist best known internationally for his excellent textbook, Lehrbuch der Entomologie, is preparing a second edition of the Lehrbuch and has sent out a request for reprints on entomological subjects. He writes: "During the war I have lost my library, my collection of zoological papers and all my other possession. ... The conditions of public libraries in Germany are rather bad and will stay so for some time; at Tübingen foreign literature is scarcely available." His address is:

Prof. Dr. Hermann Weber
Zoölogisches Institut
Hölderlinstrasse 12
(14b) Tübingen, (French Zone) GERMANY

At least the first 20 pages of the "Service Directory" have been issued by S.C. Carpenter, Box 1344, Hartford, Conn. The Directory is mimeographed and is a list of dealers of scientific supplies, arranged alphabetically by objects sold. While it is very incomplete, all potential purchasers of such supplies will undoubtedly find many useful references to dealers.



BRIEF BIOGRAPHIES

20. Jacob Hübner (1761-1826)

In 1937 Francis Hemming, of London, published the results of an intensive and complete study of the entomological works of Jacob Hübner and settled so far as possible the doubtful dates of Hübner's publications. The tremendous zoological importance of a work of this kind testifies to the major position of its subject, for the dates of Hübner's works affect the validity and use of a large portion of generic names of Lepidoptera. Mr. Hemming's book*, contained in two large volumes, is an exceptionally fine piece of bibliographical research, and we are indebted to him and to the Royal Entomological Society of London for kindly giving permission to draw on the book for the material in this brief survey of Hübner's life and work, and to reproduce the photograph above.

Jacob Hübner was born in Augsburg, Germany, on June 20, 1761, just three years after the publication of Linnaeus' tenth edition of *Systema Naturae*, a foundation-stone on which Hübner was later to build. Little is known about his early life. As a young boy he apparently excelled in school work, being especially talented at drawing. He was a keen observer of anything strange or interesting, and recorded his views in sketches. This may have introduced him to the world of insects. Upon completion of his schooling, he was apprenticed to an etcher or designer in the town. Augsburg was a cotton-weaving center, and the production of new prints was a special pride. Hübner proved successful in this

* Hemming, Francis, Hübner, A bibliographical and systematic account of the entomological works of Jacob Hübner, 2 vols. xxxiv 605 pp.; Royal Entomological Society of London. 1937.

work and obtained a good position at the conclusion of his apprenticeship.

Hübner's interest in natural history probably emerged in his late teens or early twenties. In 1784 he made his first attempts at copper plate illustrations of Lepidoptera, thus beginning a career that produced an unbelievable number of masterfully executed plates of Lepidoptera. In 1785 his first publication appeared - sixteen pages and three plates of new and little-known species of Lepidoptera. In 1786 he began publishing the *Beiträge zur Geschichte der Schmetterlinge* on the early stages of Lepidoptera, a pioneering emphasis on life history, and by 1790 two illustrated volumes had appeared.

A chance for the broadening of his entomological, as well as artistic, interests came when in 1786 he went to Niemierow, in the Ukraine (Russia) as a designer at a cotton factory. While there he did much Lepidoptera collecting and made a list of Ukrainian butterflies (never published). On the journey to and from Niemierow he was able to meet some foreign entomologists and inspect their collections and libraries. In 1789 he returned to Augsburg to continue his profession.

He made a small diversion into ornithology in 1793 with the publication of a work on birds and Lepidoptera. In later years he also wrote on such varied subjects as American Agaves, Bavarian land snails, and the city of Augsburg, but his work on Lepidoptera received the major part of his attention. At intervals of a few years appeared: the beginning of a synonymic catalogue of the Lepidoptera of the world; a large "monograph" of early stages of European Lepidoptera entitled *Geschichte europäischer Schmetterlinge* (1793), which contained at its conclusion 500 plates; and the initial parts (1796) of his great illustrated work on European Lepidoptera, *Sammlung europäischer Schmetterlinge*, with a total of 700 plates.

In 1793 Hübner married an Augsburg woman, Maria Domanal, and they enjoyed an unusually happy domestic life, unmarred except by the unavoidable misfortunes of war-produced financial troubles. After his marriage, Hübner evidenced a new spirit of confidence and vigor which is apparent in his work. There was one child of this marriage, a daughter, who affectionately cared for her father after the great sorrow of his wife's death about six years before his own, which occurred on September 13, 1826.

The famous and controversial *Tentamen*, a small pamphlet containing Hübner's new suggested classification for Lepidoptera, was distributed to his friends in 1805, though never "legally" published. It provided for nine "Phalanges" (= suborders), divided into "Tribus" (= family), and "Stirps" (= genus), an important advance over previous groupings. Hübner's early works were based on the then-current division of the Lepidoptera into only two groups, as in Linnaeus' system, - all butterflies under *Papilio* and all moths under *Phalaena*. This was then modified in his works into subdivisions of the two groups, written with the new category name in parentheses between *Papilio* (or *Phalaena*) and the specific name. As his work progressed this was modified also, un-

til in 1805 the Tentamen classification was produced.

As Hübner's geographical interests and contacts increased, his broadened outlook on Lepidoptera was shown by a publication on non-European fauna - Sammlung exotischer Schmetterlinge (1806), with the classification based on his Tentamen.

His most important work, both in his own opinion and that of others, Verzeichniss Bekannter Schmetterlinge [sic!], a systematic and bibliographical catalogue of the Lepidoptera of the world containing hundreds of new generic names, gave the final revision of classification with two more divisions between "Stirps" and "Genus". "The essential soundness of these categories may be judged by the fact that in its broad outlines the classification adopted in the Verzeichniss remains the classification in force to-day" (Hemming). It is small wonder that Hübner's name remains so familiar in lepidopterology of the world even today, over 145 years after the Tentamen appeared.

Jeanne E. Remington



THE ENTOMOLOGICAL WORKS OF JACOB HÜBNER

1785. Abbildungen und Beschreibungen noch nicht abgebildeter und noch unbeschriebener Schmetterlinge.
- 1786-90. Beiträge zur Geschichte der Schmetterlinge, 2 vols.
1793. Sammlung auserlesener Vögel und Schmetterlinge. [1790] - [1793]. Der Schmetterlinge Lepidoptera Linnei, Europäisches Heer.
- [1793] - [1842]. Geschichte europäischer Schmetterlinge.
- 1796-[1838]. Sammlung europäischer Schmetterlinge.
1796. Die Europäische Schmetterlinge, Gesammelt [sic!], Geordnet, und Beschrieben (modified edition of last-named publication).
1805. Tentamen (ruled never validly published, by International Commission on Zool. Nomenclature).
- 1806-[1838]. Sammlung exotischer Schmetterlinge, 3 vols.
1808. Erste Zuträge zur Sammlung exotischer Schmetterlinge (later, new text called Zuträge zur Sammlung exotischer Schmettlinge [sic!], 5 vols. 1818-1837).
- 1816-[1826]. Verzeichniss bekannter Schmettlinge(!).
1820. Lepidopterologische Zuträge.
1821. Index exoticorum Lepidopterorum.
1822. Systematisch-alphabetisches Verzeichniss aller bisher bey den Fürbildungen zur Sammlung europäischer Schmetterlinge angegebenen Gattungsbennungen.
1823. Verzeichniss aller bisher zur Geschichte europäischer Schmetterlinge, gesammelt von Jacob Hübner, in Augsburg, erschienenen Blätter der Larvae Lepidopterorum.
- [1825]. Catalogue des Lépidoptères qui composent la Collection de feu Mr Franck (authorship anonymous).

The long-awaited revision of this difficult and ubiquitous genus for North America was issued on 22 August 1949 as a part of Volume 93 of the Bulletin of the American Museum of Natural History (New York). It is the culmination of a series of smaller papers on Eupithecia by Dr. McDunnough.

Only six new species are described in the present work and yet a glance at the List of Species (pp. 706-708) of Eupithecia and the very closely related Nasusina and Prorella shows that there are now recognized for North America 145, 4, and 14 species, respectively, of the three genera, and 27 additional races of Eupithecia. Few genera of Lepidoptera can compare with this number of species, and Dr. McDunnough points out that there are even more Palearctic species of Eupithecia. It is remarkable that all these species are so relatively homogeneous that Dr. McDunnough, like the European specialists, has been unable to find grounds for dividing Eupithecia into smaller, more convenient genera. He even regards Nasusina and Prorella as so uncertain that he retains them as distinct genera "merely as a matter of convenience". Students of theoretical speculation may find Eupithecia particularly intriguing material, since the species must have evolved to a point of distinctness through an unusual sequence of evolutionary events as compared to other groups of winged insects, in which fewer closely related entities now occur.

Dr. McDunnough discusses the structural characters he has used for classification and shows that the most valuable are male genitalia, female genitalia, and the ciliation of the male antennae. He figures the genitalia for the major part of the species, and he presents photographs of the wing patterns of nearly all. He acknowledges the photographic aid of C.F. dos Passos, and presumably the photographic apparatus described in the Lepidopterists' News (vol. 3: pp. 41, 42) was utilized. A particularly valuable feature of the illustrations is the inclusion of precise locality data for each figure.

The treatment of every species usually includes: 1) detailed bibliographic synonymy; 2) comparative discussion of wing pattern; 3) detailed description and notes on variations of male genitalia and female genitalia; 4) data and present location of types; 5) complete distribution; 6) all available information on life history; 7) notes on specimens figured.

The printing of the text of the revision is of fine quality and it is surprising to find the reproduction of figures rather poor. Details of the figures of genitalia are frequently badly blurred and the printing of the photographs rarely does justice to what presumably were clear originals.

The price of this important publication is stated to be \$2.50 per copy. It may be obtained from: The American Museum of Natural History, Central Park West at 79th St., New York 24, N.Y.

C.L. Remington

*See Recent Lit. #270, on p. 110 of this issue of the Lep. News, for complete reference.

RECENT LITERATURE ON LEPIDOPTERA

234. Antram, Chas. B., "Note on the Butterflies of the New Forest in 1949." Ent. Rec. & Journ. Var., vol. 61: pp.111-112. Nov. 1949.
235. Beebe, William, "Insect Migration at Rancho Grande in North-central Venezuela. General Account." Zoologica (N.Y.), vol.34: pp.107-110, 2 pls. 10 Aug. 1949. Records vast annual migrations, mainly of Lepidoptera, through Portachuelo Pass, Venezuela. Found recurrent waves, each up to 3 weeks duration, of few species. Normal flight characteristics of any species remain same in migration. Both sexes present and ♀♀ gravid. No return flight occurs. Estimates made of 1000 per second passing through the Pass. Detailed reports to follow. (C.R.)
236. Bentinck, G.A., "Paltodora cyteisella Curt. griseocapitella nov. var." (In Dutch). Tijdschr. voor Entomol., vol.90, 1946: pp.43-44. 1 July 1949. A new variety captured in Holland much deviating from the typical form is described and ♂ genitalia figured (fam. Gelechiidae). (A.D.)
237. Blackwelder, Richard E., "Citing Literature in the Coleopterists' Bulletin." Coleop. Bull., vol.3: pp.55-59. 29 Aug. 1949. Useful guide for abbreviating titles. (C.R.)
238. Blackwelder, Richard E., "Synonyms and Genotypes." Coleop. Bull., vol.3: pp.73-75. 8 Nov. 1949. Maintains that name to be used is actually "senior synonym", name usually known as "synonym" should be called "junior synonym". Simple, clear discussion of use of genotypes (= "genotypes"), but one impractical contention: "no writer should ever describe a new species in a genus whose genotype has not been determined and is believed to be congeneric with the new species." (C.R.)
239. Borey, Paul, "Le Carpocapse des pommes, Enarmonia pomonella L., ravageur des abricots en Valais." (In French). Mitt. Schweiz. Ent. Ges., vol.22: pp.137-172, 15 figs. 30 July 1949. Biology of pomonella and control measures against it are described. (P.B.)
240. Bourgogne, J., "Note sur la systématique des Lépidoptères et création de deux superfamilies" (In French). Rev. Franc. Ent., vol.16: pp.74-77. 1949. Erects the superfamilies ERIOCRANIOIDEA, including Eriocraniidae, and CALLIDULOIDEA, including the Pterothysanidae and Callidulidae. Discusses also the other bombycid families and redefines the superfamily Bombycoidea. (P.B.)
241. Capps, Hahn W., "Status of the Pyraustid Moths of the Genus Leucinodes in the New World, with Descriptions of New Genera and Species." Proc. U.S. Nat. Museum, vol.98: pp.69-83, pls.5-10. 1948. Shows genotype of Leucinodes to be orbonalis Guen. Erects new genera NEOLEUCINODES (type - elegantalis Guen.), PROLEUCINODES (type - melanoleuca Hamps.), and EULEUCINODES (type - conifrons sp.n.). Includes in Neoleucinodes: elegantulus; dissolvens; prophetica; torvis, sp.n. (Santiago, Cuba); imperialis. Includes in Proleucinodes: melanoleuca; xylopastalis; lucealis. Includes in Euleucinodes only conifrons (Rio Morona, Peru). Removes impuralis from Leucinodes. Describes pattern and genitalia, gives host plants, distributions, and detailed figures. (C.R.)
242. Cockayne, E.A., "Arctia caja L.: its variation and Genetics." Proc. & Trans. So. London Ent. & Nat. Hist. Soc., 1947-48: pp.155-191, 2 pls. March 1949. Gives descriptions of all known local races and aberrations; describes and names 30 new aberrations, of which 18 are figured in color. Gives notes on the effect of temperature and narcotics on wing pattern development; outlines all known information on genetics of the various forms. A noteworthy paper, aside from the burden of aberration nomenclature. (P.B.)
243. Collette, C.L., "The Lymantriidae of Bali." Entomologist, vol.82: pp.169-175, 1 pl. Aug. 1949. Lists, with notes, all species recorded (51). Describes as new: Euproctis bali; E. psammoides; E. atrisignata pega; Dura eucaera; Perina tamsi; P. kalisii, all from Bali. ♂ genitalia of all 6 figured. (P.B.)
244. Corbet, A. Steven, "The Linnaean names of Indo-Australian Rhopalocera. Part 6. The case of Papilio plexippus Linnaeus, 1758." Proc. R. Ent. Soc. Lond. (B), vol.18: pp.184-190. 17 Oct. 1949. This name is properly applicable to the oriental Danaus genutia; but recommends because of usage that it be retained for the North American Monarch. (So decided by the International Commission). (P.B.)
245. Corbet, A. Steven, "The Linnaean Names of Indo-Australian Rhopalocera. Part 7. Summary of determinations." Proc. R. Ent. Soc. Lond., vol.18: pp.191-199. 17 Oct. 1949. Includes an annotated list of all species of 'Papilio' described from this region by Linnaeus, with their currently accepted names. (P.B.)
246. Donchoe, H.C., P. Simmons, D.F. Barnes, G.H. Kalostian, C.K. Fisher, & C. Heinrich, "Biology of the Raisin Moth." U.S. Dept. Agr. Tech. Bull., no. 994: 23 pp., 1 pl., 5 figs. Sept. 1949. Exhaustive account of distribution, habitat, habits, enemies of Ephestia figulella. Detailed descriptions and figures of ova, larvae, pupa, adult, including ♂ and ♀ genitalia, larval cranial and setal characters. (C.R.)
247. Dufrane, Abel, "Note sur les Danaïdes" (In French). Bull. Mens. Soc. Linn. Lyon, vol.17: pp.192-194. Dec. 1948. Notes on range and variation of 26 spp. Names and describes 23 aberrations (including 3 WITHOUT LOCALITY, of D. plexippus). Hardly a contribution to science! (P.B.)
248. Eliot, Nevill, "The Significance of the Wing Pattern of Precis (Nymphalidae) in America." Entomologist, vol.82: pp.176-184, Aug. 1949. Notes on phylogeny and zoogeographical aspects of wing pattern. (P.B.)
249. Franclemont, John G., "A New Moth on Coconut from Cuba, with Descriptions of New Genera for Related Species (Lepidoptera, Phalaenidae)." Proc. Ent. Soc. Wash., vol.51: pp.279-285, 3 pls. Dec. 1949. Erects new genera: ECHINOCAMPA (type - cocophaga, sp.n.); ELEGOCAMPA (type - Herminodes gatharina); RHAMNOCAMPA (type - albigstriga). The 3 plates figure the ♂ and ♀ genitalia and the wing venations. (C.d.P.)
250. Freeman, H.A., "A Summary of New Butterflies from Texas." Texas Journ. Sci., vol.1: pp.40-41. 30 Sept. 1949. Abbreviated bibliography listing 40 new records and species descriptions. (P.B.)
251. Freeman, T.N., "The identity of Malacosoma fragile (Stretch) and M. lutescens (N. & D.) (Lepidoptera: Lasiocampidae)." Can. Ent., vol.81: p.233. Sept. 1949. Considers the latter name applicable to the Canadian prairie species. The author claims that the former name should be written fragile, not fragilis as it was proposed. [That is an error. Fragilis is a Latin adjective of the third declension. Fragilis is both the masculine and feminine, hence it must be used in connection with the feminine generic name Malacosoma, in conformity with the Article 14a of the Rules of Zoological Nomenclature.] (C.d.P.)
252. Grison, P. & R. Roehrich, "Comparaison du développement des chenilles d'Operophtera brumata L. (Lep. Geometridae) et Euprotis [sic] phaeorrhoea Don. (Lep. Liparidae) à différentes températures constantes." Bull. Soc. Ent. France, vol.54: pp.12-16. Jan. 1949. Found both spp. developed successively more rapidly at 10°, 15°, 20°, 25°, 30°, but mortality lowest at 25° for phaeorrhoea and at 10° for brumata. 15 references. (C.R.)

253. Hardy, George A., "Notes on the Life History of *Xanthorhoe defensaria* Gn. (Lepidoptera: Geometridae)." *Proc. Ent. Soc. Brit. Columbia*, vol.45: pp.17-19. 28 July 1949. Ova from captive ♀; larvae reared on *Stellaria media*; total larval period (4 instars) - 34 days, pupal period - 25 days. Rearings at room temp. in winter (ova did not diapause). Suggests all named forms of *defensaria* are seasonal. All instars and pupa described in detail; no figures. (C.R.)
254. Harper, G.W., "Notes on a Brood of *Nymphalis polychloros* L." *Entomologist*, vol.82: pp.185-187. Aug. 1949.
255. Havas, L.J., & J. Kahan, "Hormone-Mimetic and Other Responses of the Silkworm (*Bombyx mori* L.) to Some Polyploidogenic Substances." *Nature*, vol.161: pp. 570-571, 1 fig. 10 April 1948. Reports production of morphological abnormalities by treatment with colchicine and acenaphthene, and effect of colchicine in accelerating development. (P.B.)
256. Hedges, A.V., "Technique of Breeding Lepidoptera." *Proc. & Trans. So. London Ent. & Nat. Hist. Soc.*, 1947-48: pp.74-81. March 1949. Notes on a number of British spp.; a few "forms" seem, on the basis of breeding experience, to be distinct species. Brief summary of general technique. (P.B.)
257. Hinton, H.E., "On the Function, Origin, and Classification of Pupae." *Proc. & Trans. So. London Ent. & Nat. Hist. Soc.*, 1947-48: pp.111-154, 39 figs. March 1949. Regards pupal stage as first imaginal instar, homologous with subimago of mayflies. The pupa is best explained as a device to permit development of imaginal muscles in a mold of same form as imago, in insects in which latter differs in form from larva. Divides pupae into 2 types: denticous, with functional mandibles for escape from cocoon (primitive), and adenticous, without functional mandibles; the latter group includes obtect and exarate subtypes. Discusses pupal evolution in many orders, especially Lepidoptera and Diptera. Again considers Micropterygidae as distinct order Zeugloptera. (P.B.)
258. Hovanitz, William, "Occurrence of Parallel Series of Associated Physiological and Morphological Characters in Diverse Groups of Mosquitoes and Other Insects." *Contrib. Lab. Vert. Biol.*, no.32: 24 pp. Feb. 1947. Includes *Coelias* and *Euphydryas chalcedona* in generalizations that related species or forms with higher metabolic rates: have greater adult activity; mate in smaller space in lab.; prefer hotter and drier environment; have less melanin; have darker pterines; are worse pest to man. (C.R.)
259. Huggins, H.C., "Two New Varieties of *Peronea cristana*." *Entomologist*, vol.82: p.156. July 1949. Two aberrations are named. (P.B.)
260. Hulls, L.G., "An Ingenious Method of Forcing Pupae Employed by Réaumur." *Entomologist*, vol.82: pp. 154-155. July 1949. Pupae are put in glass balls, which are then incubated by a hen. [This paper is a translation from a French memoir of 1736.] (P.B.)
261. Jacobs, S.N.A., "The British Lampronidae and Adelidae." *Proc. & Trans. So. London Ent. & Nat. Hist. Soc.*, 1947-48: pp.209-219, 1 pl. March 1949. Excellent summary of the British species, covering imaginal characters, distribution, food plants, and larval habits. Keys to genera and species given; all (26) spp. are figured in color. (P.B.)
262. Jones, J.R.J. Llewellyn, "An Experiment with Larvae of *Lambdina fiscellaria somnaria* Hulst." *Proc. Ent. Soc. Brit. Columbia*, vol.45: p.6. 28 July 1949. Larvae of *somnaria* from Oak transferred to Hemlock with good results, though average size was distinctly reduced. Also found that larvae from Hemlock accepted Oak. Evidence supports Capps' sinking of *somnaria* and *lugubrosa* as races of *fiscellaria* (Geometridae). (C.R.)
263. Katwijk, D. van, "Overzicht van de lichtvangst van Lepidoptera in 1948" (In Dutch). *Entomol. Berichten*, vol.12: pp.400-401. 1 July 1949. Gives record of collecting in 1948 in Holland: at light, bad; on catkins, reasonable; on sugar, bad. (A.D.)
264. Lambert, Robert, et al, "Annual Report of the Forest Insect Survey." Dept. of Agr. Canada: 124 pp., maps. 1949. Summary of 1948 abundance and destruction by forest insects in Canada. Special attention given to *Acleris variana*, *Hemerocampa leucostigma*, *H. pseudotsugata*, *Lambdina fiscellaria*, *L. somnaria*, *Malacosoma disstria*, *M. pluviale*, *Coleophora laricella*, *C. salmani*, *Choristoneura fumiferana*, *Stilpnotia salicis*, *Alsophila pomataria*, *Palaearctia vernata*, *Diorvctria reniculella*, *Rhyacionia buoliana*, *Anisota rubicunda*, *Recurvaria milleri*, and others. Important for later phenological reference. (C.R.)
265. Leech, Hugh B., "The Occurrence of a Hollyhock-Seed Eater, *Noctuella rufofascialis*, at Vernon, British Columbia (Lepidoptera, Pyralidae)." *Proc. Ent. Soc. Brit. Columbia*, vol.45: pp.25-26, 2 figs. 28 July 1949. Description of habits and of heavy infestation of hollyhocks in 1945. Drawings of adult and mature larva given. (C.R.)
266. de Lesse, H., "*Hipparchia fagi* Scop. et *H. aelia* Hoffm." (In French). *Bull. Mens. Soc. Linn. Lyon*, vol.17: pp.123-129. Sept. 1945. Reviews the work of Fruhstorfer and Hemming on these satyrids, and gives his own conclusions as to their status: *fagi* and *aelia* fly together over much of Europe but are quite distinct; *H. ellena* from N. Africa and *H. syriaca* from S.E. Europe and the Near East are close to *H. aelia*. Species distinctions are based mainly on genitalia and 'Jollien's organ' on the ♂ 8th abdominal segment, which are described but unfortunately not figured. (P.B.)
267. Lewin, Anders, "Notes on *Fumea* Haw. and *Proutia* Tutt. (Lep.)." (In English). *Ent. Tidskrift*, vol. 70: pp.155-170, 7 figs. 1949. Describes new subgenus ANAPROUTIA (type: *norvegica* Schöy) of genus *Proutia*. Because of aculei on forewing, claims *Proutia*, *Masonia*, *Fumea*, *Bacotia*, *Talaeoporia* are not Psychidae but actually Tineina and form the family Fumeidae. Gives detailed figures of many structures of several spp. of *Proutia*, *Masonia*, *Fumea*. Maintains strongly that *Fumea* is not parthenogenetic, as claimed by some authors. Describes habits of many spp. (C.R.)
268. Lucas, Daniel, "Contribution à la Faune des Lépidoptères de l'Afrique du Nord." *Bull. Soc. Ent. France*, vol.54: p.96. June 1949. Describes as new very briefly, mainly in Latin without figures: "*Pyralis Mariae* Ludovicae, n.sp.", *Heterographis sfaxella*, 2 named varieties and 2 named aberrations, all from Tunis. The *Pyralis* specific name is polynomial and therefore not valid under the Règles. This paper looks like something of 1825 vintage. (C.R.)
269. DeLuca, C., "Microlepidoptera New to the Maltese Islands." *Entomologist*, vol.82: pp.148-149. July 1949. 12 hitherto unrecorded spp. listed. (P.B.)
270. McDunnough, James H., "Revision of the North American Species of the Genus *Eupithecia* (Lepidoptera, Geometridae)." *Bull. Amer. Mus. Nat. Hist.*, vol.93: pp.533-728, pls.26-32, 20 figs. 22 Aug. 1949. Tentatively keeps *Nasusina* and *Prorella* as distinct genera. Describes as new: *Eupithecia slossonata* (Fla.); *E. isjunata* (Georgetown, Tex.); *E. rindgei* (Keddie, Calif.); *E. redingtonia* (Redington, Ariz.); *E. cestatoides* (Half Moon Bay, Calif.); *P. ochrocarnea* (Huachuca Mts., Ariz.); *P. tremorata* (Borego, Calif.). Figures ♂ and ♀ genitalia of most. Gives photos of 209 adults. (See review on p.108 of present issue of *Lep. News.*) (C.R.)

RECENT LITERATURE ON LEPIDOPTERA - cont.

271. McDunnough, James H., "A Study of the Species of the Genus *Stretchia* (Lepidoptera, Phalaenidae, Hadeninae)." Amer. Museum Novitates, no.1436: 29 pp., 4 figs. 21 Nov. 1949. Describes as new: *S. pictipennis* (Mohawk, Calif.), *S. pacifica* (Inverness, Calif.). Redescribes in detail, with genitalia, *S. pl. plusii-formis*, *S. pl. coloradicola*, *S. prima*, *S. inferior*, *S. muricina*. Figures of antennae of most, ♂ genitalia of all but *prima* and *pictipennis*, ♀ genitalia of *prima* and *muricina*. (C.R.)
272. Michelbacher, A.E., W.W. Middlekauff, & N.B. Akesson, "Caterpillars Destructive to Tomato." Calif. Agr. Exper. Sta. Bull., no.707: 47 pp., 19 figs. May 1948. Brief descriptions and figures of adults, larvae, and biology in California of *Heliothis armigera*, *H. phloxiphaga*, *Prodenia praefica*, *Laphygma exigua*, *Autographa californica*, *Keiferia lycopersicella*, *Gnorimoschema operculella*, *Phlegethontius sextus*, *P. quinquemaculatus*. Mainly devoted to chemical control. (C.R.)
273. Michener, Charles D., "New Genera and Subgenera of Saturniidae (Lepidoptera)." Journ. Kansas Ent. Soc., vol.22: pp.142-147. Oct. 1949. Validates new names used in paper in Evolution (see Lep. News 3: p.81, #212). Large revision to appear later. In following list, types are in parentheses - (). Describes as new genera: *CEROPODA* (*johnsoni* sp.n.); *PSILOPYGOIDES* (*oda*); *PSILOPYGIDA* (*crispula*); *CALLODIRPHIA* (*arpi*); *TRAVASSOSULA* (*subfumata*); *AETOMERIS* (*erythrois*); *EUBERGIOIDES* (*bertha*); *AUTOMERINA* (*caudatula*); *CERODIRPHIA* (*rubripes*). New subgenera are: of *Citheronia*, *PROGITHERONIA* (*fenestrata*) and *CITHERONULA* (*armata*); of *Syssphinx*, *BOUVIERINA* (*hogeii*); of *Adelocephalia*, *OITICICIA* (*purpurascens*); of *Adelocwalkeria*, *CERATESA* (*hemirhoda*) and *SCOLESA* (*totoma*) and *MEGACERESA* (*pulchra*) and *PTILOSCOLA* (*lilacina*); of *Automeris*, *AUTOMERELLA* (*flexuosa*) and *AUTOMEROIDES* (*ornateus*) and *RACHESA* (*adusta*); of *Automerina*, *AUTOMERULA* (*auletes*); of *Ormiscodes*, *DIRPHIELLA* (*albofasciata*) and *XANTHODIRPHIA* (*amarilla*) and *PARADIRPHIA* (*conrea*) and *RHODIRPHIA* (*carminata*) and *MEROLEUCOIDES* (*flavosignata*) and *CERODIRPHIA* (*rubripes*). New species is *Ceropoda johnsoni* (Matto Grosso, Brazil). *Dysdaemonia*, *Titaea*, *Paradaemonia*, *Argenura* placed as subgenera of *Rhesocytis*; *Pseudohazis* a subgenus of *Hemileuca*; *Calosaturnia* and *Agapema* a subgenus of *Saturnia*; *Saturnioides* and *Sagana* "congeneric with" *Copaxa*; *Callosamia* and *Eupackardia* "weak subgenera of *Hyalophora* (= *Platysamia*)"; *Telea* a synonym of *Antheraea*. (C.R.)
274. Munroe, Eugene, "Some Remarks on the *orithya* group of the genus *Junonia* (Lep., Nymphalidae)." Entomologist, vol.82: pp.157-158. July 1949.
275. Murray, Desmond P., "*Adela viridella* Scop." Proc. & Trans. So. London Ent. & Nat. Hist. Soc., 1947-48: pp.192-193, 1 pl. March 1949. Notes. Figures all stages, especially pupa with elongate antennal cases spirally coiled about tip of abdomen; also figures ♂ and ♀ genitalia. (P.B.)
276. Niemierko, W., "Fatty Acid Metabolism in Silk Worm Larvae" (In Polish, Engl. Summ.). Acta Biol. Exper., vol.14: pp.137-150, 2 figs. 1947. Fatty acid content increases during last larval instar, but decreases about 12% during cocoon formation. Degree of unsaturation increases in both periods. (P.B.)
277. Niemierko, W., "Contribution to the Biochemistry of Metamorphosis of Silk Worm" (In Polish, Engl. Summ.). Acta Biol. Exper., vol.14: pp.151-155. 1947. 40% decrease in fat during metamorphosis; relative effects on different fatty fractions. (P.B.)
278. Percy-Lancaster, S., "The Butterfly *Danaus chrysipus* in Calcutta." Journ. Bombay Nat. Hist. Soc., vol.48: pp.381. Apr. 1949.
279. Picard, J., "Sur quelques Hespérides d'Afrique (Lépidoptères)" (In French). Rev. franc. Ent., vol.16: pp.147-152, 3 figs. 1949. Describes as new: *TAVETANA* (type - *jeanneli* (British East Africa)) (venation and ♂ genitalia figured); *Pelopidas rougeoti* (Gaboon) (♂ genitalia figured); *Xanthodisca vibius rega*, form *evansi* (Sierra Leone). Places *Gelaenorrhinus bryki* as a race of *G. galenus*. (P.B.)
280. Rindge, Frederick H., "A Revision of the Geometrid Moths Formerly Assigned to *Drepanulatrix* (Lepidoptera)." Bull. Amer. Mus. Nat. Hist., vol.94: pp.231-298, 14 figs. 17 Nov. 1949. Describes as new: *EUDREPANULATRIX* (type - *rectifascia*); *APODREPANULATRIX* (type - *liberaria*) (also includes *litaris*); *Drepanulatrix quadraria usta* (Inverness, Calif.). Synonymizes *ella* and *ida* under *D. unicalcararia*, *rindgearia* under *D. hulstii verdiana*, *pulveraria* under *D. foeminaria*, *lutearia* under *D. c. carnearia*, *californaria* and *ferruginosaria* under *D. monicaria*, and *helenia* under *A. liberaria*. Places as subspecies *verdiana* under *D. hulstii*, *ruthiana* under *D. bifilata*, *columbaria* under *D. carnearia*. Redescribes in detail all other species and races listed in the 1938 McDunnough Check List. Gives keys to adults, ♂ genitalia, ♀ genitalia, and larvae of the 3 genera and to pupae of all but *Eudrepanulatrix*. Gives keys to adults and ♂ and ♀ genitalia of all spp. and to larvae and pupae of *monicaria*, *carnearia*, *baueraria*. Gives large distributional maps and table of flight periods of all spp. and races. Figures details of ♂ and ♀ genitalia of all spp. Presents all available notes on biology. An exceptionally thorough work. (C.R.)
281. da Rocha, Newton, "Notas biológicas sobre o esfingeo *Erinnyis ello* L., 1758" (In Portuguese). Bol. Secr. Agr., Indust. Comercio, Est. Pernambuco, Brasil, vol.15: pp.398-399, 1 pl. July-Dec. 1948. Notes on parasitism by fly, *Belvosia bifasciata*. (P.B.)
282. Root, Oscar M., "Mimicry of the Monarch Butterfly by the Viceroy." Turtlex News, vol.27: pp.153-154. July 1949. Protests against continued spread of old view that Viceroy mimics Monarch butterfly to gain protection from birds, arguing that virtually all butterflies are safe from birds. (C.R.)
283. Rougeot, P.C., "Description de quelques Saturnides du Gabon" (In French). Bull. Mens. Soc. Linn. Lyon, vol.17: pp.7-10, 1 pl. Jan. 1948. Describes as new: *Nudaurelia dionysiae*, *Drepanoptera berlozi*, *D. torquata* form *testouti*, all from single specimens, all from Gabon. Figures these and the recently described ♀ of *D. rectificata*. (P.B.)
284. Rougeot, P.C., "Première capture de *Nudaurelia bouvieri* Le Moutt au Gabon" (In French). Bull. Mens. Soc. Linn. Lyon, vol.17: p.155. Oct. 1948.
285. Rupert, Laurence R., "Notes on the group of genera including *Lozogramma* Stephens and its allies (Lepidoptera, Geometridae, Ennominae)." Proc. Ent. Soc. Wash., vol.51: pp.137-151. 2 pls. Aug. 1949. Discusses the genera *Philedia*, *Thallopaga*, *Gueneria*, *Homochloides*, *Lozogramma*, *Tacparia*, and *Pachycnemis*, giving their genotypes. Mentions some of their included species and proposes new combinations for some of them. The figures are excellent. (C.d.P.)
286. Schwanwitsch, B.N., "Evolution of the wing-pattern in the Lycaenid Lepidoptera." Proc. Zool. Soc. London, vol.119: pp.189-263, 337 figs. May 1949. Continues the author's long series of studies of wing pattern evolution in Lepidoptera. (P.B.)

287. Sevastopulo, D.G., "A Supplementary List of the Food-Plants of the Indian Bombycidae, Agaristidae and Noctuidae." Journ. Bombay Nat. Hist. Soc., vol. 48: pp.265-276. Apr. 1949. Collects food-plant records from literature and adds a few new ones, for families Zygaenidae, Syntomidae, Arctidae, Lymantriidae, Thaumatopeoidea, Lasiocampidae, Eupterotidae, Bombycidae, Drepanidae, Saturniidae, Notodontidae, Limacodidae, Psychidae, Thyrididae, Indarbelidae, Cossidae, Agaristidae, Noctuidae. Some error in titling this paper must have been made. (C.R.)
288. Sevastopulo, D.G., "The Butterfly Genus Delias." Journ. Bombay Nat. Hist. Soc., vol.48: pp.378-379. Apr. 1949. Notes on distastefulness of butterflies in all stages. (C.R.)
289. Smith, Ray F., D.E. Bryan, & W.W. Allen, "The relation of flights of Colias to larval population density." Ecology, vol.30: pp.288-297, 7 figs. July 1949. Study of C. eurytheme made in alfalfa fields near Westley, Calif. Found large flights made into fields with alfalfa less than 8" tall. Larval samples taken by sweeping. (C.R.)
290. Steinhaus, Edward A., "A new disease of The Variegated Cutworm, Peridroma margaritosa (Haw.)." Science, vol.106: p.323. 3 Oct. 1947.
291. Steinhaus, Edward A. & Clarence G. Thompson, "Granulosis Disease in the Buckeye Caterpillar, Junonia coenia Hübner." Science, vol.110: pp.276-278, 1 fig. 16 Sept. 1949.
292. Steyskal, George C., "An Indexing System for Taxonomists." Coleop. Bull., vol.3: pp.65-71. 8 Nov. 1949. Sets forth technique for keeping species and bibliographic files. (C.R.)
293. Temple, Vere, "The Courtship Flight of Butterflies as the Means of Extending the Range of Certain Species." Entomologist, vol.82: pp.145-147. July 1949.
294. Testout, H., "Révision du Catalogue des espèces françaises du genre Erebia (Lepid. Satyridae), 6^{me} parties" (In French). Bull. Mens. Soc. Linn. Lyon, vol.17: pp.90-98, 116-122, 147-154. June, Sept., Oct. 1948. Conclusion of the series. Completes the descriptions of individual forms, gives an addendum of new locality records and a summary catalogue of all forms. Describes as new: E. meclans stygne form rielli (S.E. France). (P.B.)
295. Testout, H., "Description de nouveaux Drepanoptera africains et révision du groupe d'antinorii Obth." (In French). Bull. Mens. Soc. Linn. Lyon, vol.17: pp.189-191. Dec. 1948. Describes as new: D. racunoides (Gold Coast); D. ugandensis (British E. Africa). Groups latter with antinorii and marginimacula. Describes pattern and ♂ genitalia of all 4 spp. (P.B.)
296. Townes, Henry, "The effectiveness of DDT against dermestids in insect boxes." Proc. Ent. Soc. Wash., vol.51: pp.165-168, 1 table. Aug. 1949. The results indicate that DDT has some value against dermestids, but is no sure preventative. (C.dP.)
297. Viette, P., "Contribution à l'étude des Hepialidae (7^e Note). Le genre Trichophassus Le Cerf." Bull. Soc. Ent. France, vol.54: pp.72-73, 3 figs. May 1949. Shows validity of genus, describing external characters and ♀ and ♂ genitalia, figuring latter and antennae. (C.R.)
298. Viette, Pierre E.L., "Catalogue of Heterocerous Lepidoptera from French Oceania." Pacific Science, vol.3: pp.315-337. Oct. 1949. Lists 402 species distributed as follows: 6 Tineidae; 17 Lyonetiidae; 2 Plutellidae; 6 Gracilariidae; 2 Coleophoridae; 3 Hyponomeutidae; 1 Elachistidae, 10 Glyphipterygidae; 5 Schreckensteiniidae; 1 Copromorphidae; 1 Orneodiidae; 3 Carposinidae; 1 Oecophoridae; 46 Cosmopterygidae; 6 Gelechiidae; 16 Eucosmidae; 24 Tortricidae; 2 Limacodidae; 94 Pyralidae; 3 Pterophoridae; 1 Thyrididae; 17 Sphingidae; 39 Geometridae; 1 Uranidae; 1 Epiplemidae; 2 Amatidae; 15 Lithosiidae (incl. Arctiidae); 75 Noctuidae; 1 Lymantriidae. Distributions included. Extensive list of references given. All such catalogues are valuable, but soundness of such artificial geographic limitation seems doubtful. (C.R.)
299. Viette, P., "Contribution à l'étude des Micropterygidae (5^e Note). Position systématique de la famille (Lepidoptera)" (In French). Rev. Franç. Ent., vol.16: pp.69-73. 1949. Historical review and discussion of the position of this family. Prefers to retain them in the Lepidoptera. (P.B.)
300. Wagner, Warren H., Jr., & David F. Grether, "The Butterflies of the Admiralty Islands." Proc. U.S. Nat. Museum, vol.98: pp.163-186, pls. 11-13. 1948. Notes on 69 spp. - 16 new records for Admiralties, 33 recorded before, 20 not found by present authors. Photos of 13 spp. from Admiralties, Yoma algina from Solomons. No notes on early stages. (C.R.)
301. Wakely, S., "Occurrence of a Species of Elastobasis resembling decolorella Wollaston in South London." Proc. & Trans. So. London Ent. & Nat. Hist. Soc., 1947-48: pp.205-209, 2 figs. March 1949. New species for England, perhaps introduced. Habits discussed; ♂ and ♀ genitalia figured. (P.B.)
302. Warren, B.C.S., "A Note on the Central European Races of Papilio machaon and Their Nomenclature." Entomologist, vol.82: pp.150-153. July 1949. (P.B.)
303. Wellington, Eunice F., "Artificial Media for Rearing some Phytophagous Lepidoptera." Nature, vol. 163: pp.574-575. 9 Apr. 1949. Summarizes studies on developing artificial rearing media for Choristoneura fumiferana, Archips rosaceana, A. fervida, and Diorcystria reniculella in Canada. A most remarkable advance. (C.R.)
304. Westerneng, R., "Pontia daplidice L." (In Dutch). Entomol. Berichten, vol.12: p.381. 21 May 1949. Gives collecting notes on daplidice in Holland. (A.D.)
305. Wichra, Jaroslav, "Hojný výskyt vakonose Sterrhopteryx standfussi H.Schäff. v Krkonosích. (Lep.)" (In Czech). Acta Soc. Ent. Cechosloveniae, vol.46: pp.73-74. 1 Feb. 1949.
306. Wightman, A.J., "Noctuae of Pulborough, Sussex, in 1948." Ent. Rec. & Journ. Var., vol.61: pp.76-78. July-Aug. 1949.
307. Wild, E.H., "Saturnia pavonia ab. (Lep. Saturniidae) flariocellatus nov." (sic!) Entomologist, vol.80: p.147, 2 figs. June 1947.
308. Williams, C.M., "Extrinsic Control of Morphogenesis as Illustrated in the Metamorphosis of Insects." Growth, vol.12, suppl.: pp.61-74, 2 figs. 1948. Summarizes his work on control of diapause of the Cecropia silkworm. (P.B.)
309. Wiltshire, E.P., "Some More New Records of Lepidoptera from Cyprus, Iraq and Iran." Ent. Rec. & Journ. Var., vol.61: pp.73-76. July-Aug. 1949.
310. Wisselingh, T.H. van, "Lepidoptera in 1947" (In Dutch). Tijdschr. voor Entomol., vol.91, Verslag: pp. XXI-XXII. 1 May 1949. Collecting notes on Macrolepidoptera in Holland in 1947. (A.D.)
311. Worm-Hansen, J.G., "A Gynandromorphic Moth." Ent. Meddelelser, vol.25: p.221. 15 June 1948. Figures bilateral gynandromorph of Stygioscola umbratica. (P.B.)
312. Wright, Albert E., "Note on the Foodplant of Phaenicia luridana, Gregson." Ent. Rec. & Journ. Var., vol.59: pp.69-70. June 1947. Bred from burdock, Arctium lappa. (P.B.)
313. Zamecnik, Paul G., Robert B. Loftfield, Mary L. Stephenson, & Carroll M. Williams, "Biological Synthesis of Radioactive Silk." Science, vol.109: pp. 624-626, 2 figs. 24 June 1949. Produced by injecting C¹⁴-labelled glycine and alanine into Platysamia cecropia larvae. (P.B.)

NOTICES BY MEMBERS

All members may use this column to advertise their offerings and needs in Lepidoptera. There is no cost for this service. Unless withdrawn sooner by the member, each notice will appear in THREE issues.

Wanted: Papered specimens of Pieris napi, Pieris bryoniae, and Papilio machaon from all parts of the world, particularly from American & Asiatic localities, with full data and in perfect condition. Offered in exchange: Papered Macro-lepidoptera from Germany, and, if possible, breeding material. Gerhard Hesselbarth, Hindenburgstr. 13, (23) Diepholz/Hann., GERMANY.

Lepidoptera from FLORIDA and WISCONSIN, a lot of over 2000 specimens, about 300 species, pinned and in papers. Want to sell the lot at bargain price. Send for list. Alex K. Wyatt, 5842 N. Kirby Ave., Chicago 30, Illinois.

Wanted: To exchange good used copy of Holland's MOTH BOOK for copy of revised edition of the BUTTERFLY BOOK in good used condition. L.H. Bridwell, Forestburg, Texas.

Wish to exchange about 200 MANITOBA MOTHS, about 50 species, half named, full data. Desire exotic Rhopalocera, particularly Morpho. What offers for the lot? C.S. Quelch, Transcona, Manitoba, Canada.

For sale: JAPANESE Papilionidae, Pieridae, Nymphalidae, and Sphingidae with all correct data supplied. Listings sent on request. M.W. Osborne, 2100 Price St., Rahway, New Jersey.

For exchange: The Spider Book, revised ed. Comstock; Hand Book of Frogs and Toads, Wright and Wright; The Grasshopper Book, Bronson; also Pennsylvania fossils. Desire ♀ specimens of Speyeria diana or Papilio ponceana ♀ or ♂ with data. J.A. Evey, Benson, Illinois.

EUROPEAN PARNASSIIDAE in papers (full data, exact names, perfect condition) for sale or in exchange for North American Papilionidae and Parnassiidae in papers. Dr. W.J. Reinthal, University of Oklahoma, Norman, Oklahoma.

For exchange: NORTHWESTERN WASHINGTON moths and butterflies collected last season. Desire Australian or any tropical Lepidoptera. Mrs. Emily Henriksen, Orcas Island, East Sound, Washington.

A complete line of entomological equipment and specimens is now available: insect boxes, mounting boards, nets, pins, Rikers, etc., as well as hundreds of species of tropical and N.Am. Lepidoptera. Price lists sent free upon request. Robert G. Wind, Rt. 145, Buena Vista, Livermore, California.

California Academy of Sciences drawers for sale. 17 x 19 x 2 1/2 inches, white lined composition bottom, double strength glass top, hand-rubbed clear lacquer finish, complete with hardware. \$6.00 each, \$65.00 doz. Cabinets available. Bio Metal Associates, P.O. Box 346, Beverly Hills, California.

Wanted: Papilionidae of world, especially Archon, Hypermnestra, Zerynthia, Baronia and Eurycus. Have for exchange many species of Japanese Rhopalocera. Yoshio Okada, Yanagida-Cho, Saga, Kyoto, JAPAN.

Wanted: Basswood mounting strips in all sizes. M.E. Cady, 21 Border St., Dedham, Massachusetts.

Spanish Lepidoptera for sale or exchange. Want American, Indo-Australian, etc. Rhopalocera and Macroheterocera. H. Flores & J. Vives, 17 Plaza Lesseps, Barcelona, SPAIN.

For sale: Ecuadorian butterflies from both slopes of Andes, collected by William Clark-Macintyre. Prices PER 100 for average material as follows:

Papilio - \$15.00; Pieridae - \$6.00; Ithomidae - \$6.00; Heliconiidae - \$8.00; Satyridae - \$7.00; Nymphalidae, common - \$6.00; Nymphalidae, uncommon - \$12.00; Lycaenidae & Erycinidae, common - \$7.00; Hesperidae - \$5.00.

Rarer material such as Morpho, Caligo, Brassolis, and material selected by genus or species - prices on application. Send for recent price lists. Advise me of your wants. F. Martin Brown, Fountain Valley School, Colorado Springs, Colorado.

For sale or exchange - Kansas butterflies and moths, esp. Papilionidae, Pieridae, Nymphalidae, Hesperidae; Heterocera: Sphingidae, Saturniidae, Arctiidae, Noctuidae, Catocalinae and Geometridae. Mounted or papered. William Howe, 822 E. 11th St., Ottawa, Kans.

Butterflies of Florida, Georgia, and the Carolinas for exchange or sale. H.L. King, 419 Highland Ave. S.W., Roanoke, Virginia.

Duplicates for exchange - butterflies from European Alps, Pyrenees, Lapland, Mediterranean, Atlas Mts., N. Africa, Alberta. British moths, also local races British butterflies. Desiderata: many N. American spp., chiefly alpine, arctic, desert & Gulf States. Correspondence welcomed. Colin W. Wyatt, Cobbetts, Farnham, Surrey, ENGLAND.

Have few pairs of Argema mitrei from Madagascar for exchange for Papilio specimens, preferably of Africa or Australia. Have also beetles (Buprestidae and Cetoniidae from Madagascar) in exchange for tropical butterflies. A. Glanz, 289 E. 98th St., Brooklyn 12, New York.

Wanted: thirty thousand butterflies and moths from all over the world. Small or large lots. Ben Karp, 3148 Foothill Blvd., La Crescenta, Calif.

Wanted to buy: Dyar's "Classification of Lepidopterous Larvae"; Rothschild & Jordan's "A Revision of the Lepidopterous Family Sphingidae" (Nov. Zool., 1903); Scudder's "The Butterflies of New England". Peter Boone, R.F.D. 3, Box #172, Princeton, N.J.

In this issue, Living Material notices will be found on page 114.





Limited number scarce Eupackardia (Callosamia) calleta cocoons for exchange. Desire pupae Callosamia angulifera and Asiatic, African and South American Saturniidae.

R.L. Halbert, 2446 Cudahy St., Huntington Park, Calif.

Wanted for cash or exchange: living ova or pupae of Papilio machaon (Palearctic), Platysamia columbia nokomis, Papilio glaucus. Urgently needed for hybridization and sterility experimentation. Also need egg masses of Catocala relictata. Also desire 200 living cocoons of Platysamia cecropia.
D.P. Frechin, 1504 N. Lafayette, Bremerton, Wash.

Cocoons or eggs of all species of AMERICAN SATURNIIDAE required. Will exchange living or preserved material of British Lepidoptera and/or Indian Saturniidae. Also willing to obtain books or other requirements of American supplier. Currency restrictions prevent cash transactions! Please help if you can. C.F. Rivers, 250 Shepherds Lane, Dartford, Kent, ENGLAND.

Wanted: chrysalids of any North American PAPILIO in exchange for good European butterflies of Par-nassiidae in papers (full data, exact names).
Dr. W.J. Reinthal, Univ. of Oklahoma, Norman, Okla.

Available now: GRAELLSIA ISABELLAE (Spanish luna) & other Palearctic fauna pupae. Otto H. Schroeter, 613 Williams St., New London, Conn.

Have cocoons of WILD CONNECTICUT SAMIA WALKERI ("Cynthia") to exchange for those of other Saturniidae.
R.W. Pease, 57 Yale Station, New Haven 11, Conn.

Wanted to buy: rearing material in season - cocoons, pupae or eggs of Rhopalocera, Saturnioidea, Sphingidae, Arctiidae and Catocala. Write first quoting prices and naming food plants. Have Austrian pins for sale, best make (Trade Mark "Elephant"), rust-proof, \$4.00 per thousand. Eugene Dluhy, 3912 N. Hamilton Ave., Chicago 18, Ill.



RESEARCH REQUESTS

Wanted: Records and field notes for all subspecies of Speyeria nokomis EXCEPT apacheana from Round Valley (for this locality, records and notes are plentiful and no more are needed). It will only take a moment to send me a card with the data from any nitocris, nigrocaerulea, caerulescens, etc. which may be available, and these records will be immensely helpful to me. Personal recollections of places like Sapello Canyon, N.M., or any other localities where nokomis subspecies have been observed will be especially welcome. A monograph of this species is in preparation.
L.P. Grey, R.F.D., Lincoln, Maine.

Urgently wanted for revisional study: Pyrausta of the illibalis-arsaltealis-gracilalis complex. Single specimens or series, from any locality, on loan, exchange, or purchase basis. Write Dr. E.G. Munroe, Systematic Unit, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Ontario, Canada.

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ADDITIONS TO THE LIST OF MEMBERS

- Agenjo, Ramon, Instituto Español de Entomología, Palacio del Hipódromo, Madrid, SPAIN. LEPID: of Spain. Coll.
- Bancroft, Larry, 1023 S. Main, Ottawa, Kansas. Coll. Ex. Buy.
- Dennis, Arthur E., 758 N. 4 E., Provo, Utah. RHOP. Life History. Coll. Ex.
- Herrera, José (Prof.), Lo Ovalle 0195, Santiago, CHILE. LEPID: genitalia.
- Krogerus, Harry W. (Dr.), Mannerheimvägen 25A, Helsingfors, FINLAND. LEPID: esp. of Canada, and Tortricidae. Coll. Ex.
- Monroe, Burt L., Jr., Ridge Road, Anchorage, Kentucky. RHOP. MACRO. Coll. Ex.
- Rivers, C.F., "Heatherbank", 250 Shepherds Lane, Dartford, Kent, ENGLAND.
- Werner, F.G., Biological Labs., Harvard University, Cambridge 38, Mass.

DECEASED

- Avinoff, Andrey (Dr.). (New York.)
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