The Lepidopterists' News

THE LEPIDOPTERISTS' SOCIETY

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THE FIELD SEASON SUMMARY OF NORTH AMERICAN LEPIDOPTERA FOR 1950

Two notable general characteristics of the 1950 season were: 1) impressive climatic events in all regions, with opposite conditions prevailing concurrently in different areas; 2) marked absence of large-scale migrations, sharply contrasting with the great year of migrations, 1949. The Season Summary itself shows two trends: 1) comparisons with other seasons were carefully developed by many field workers, but 2) the response fell below that for 1949, probably due in part to lack of dramatic migrations.

1. MIGRATIONS

The tremendous 1949 flights of Vanessa cardui, Danaus plexippus, and Celerio lineata were lacking in 1950. Apparently all the cardui perished during the winter in Canada and New England. Some were seen in early spring in Kansas, Michigan, and Georgia. In Alabama "an exceptionally good flight" was noted, but in adjacent Mississippi cardui was not found. In New Mexico a large number were seen in November. Danaus plexippus seemed generally scarcer than usual. Several "earliest" dates for 1950 were reported: Georgia, March 29; Maryland, April 26; Michigan, June 8, Wisconsin, June 8; New York, June 6; Connecticut, June 4; Maine, June 6. The fall southward flight was reported weaker than in 1949. Libytheana bachmanii appeared by the "thousands" in northern New Mexico June 29 - July 15; it was not reported elsewhere as a possible migrant this year. A conspicuous eastward migration of Ascia monuste phileta was seen in Alabama. Among the moths, swarms of Alabama argillacea appeared in Illinois, but it was notably reduced in New York, Massachusetts, and Maine (where a flight was observed Sept.7).

2. WEATHER AND POPULATIONS

This was a year of contrasts. The 1949-50 winter in the Northwest was the most severe on record; in the Southeast it was the mildest and was generally mild in the Rocky Mts., Mid-West, and East. Almost everywhere spring Lepidoptera appeared early briefly and then were delayed by the cold, wet later spring weather. The summer was very dry on the whole West Coast, the Rocky Mts., the extreme Southeast and the extreme Northeast; it was moist in southern Arizona and western Canada and average in the Mid-West and East. The population levels of most species were reported to be very low on the whole West Coast and in the Rocky Mts. and Mid-West. In the East and Southeast, flights were in general at least average.

Arizona, except for the northern section, had an excellent year; most notable was the tremendous population of Litocala sexignata, and Euparthenos nubilis also abounded; Hesperiidae were especially numerous. The dismally poor year in the Northwest had a few bright spots: Oeneis nevadensis, apparently in a precise alternate-year schedule, was common, as were Papilio oregonia and the Catocalas; noctuids were up a bit over the poor season of 1949, and Euxoa ochrogaster was an economic pest far south of its usual pest limits. In the Rocky Mts. there were a few exceptions to the poorness of the year: Erebia callias was in great numbers and again Malacosoma larvae were in serious abundance; an unequalled number of noteworthy strays arrived from far to the southward. In the Great Plains the populations were mostly high but Sphingidae and Catocalas were scarce. The Mid-West and the Central Seaboard had an almost uniformly low year, except for the Satyridae. The Southeast had a poor year. In the Northeast, much of the area had at least an average year. Hemileuca maia had a great flight on Long Island. Around Ottawa there was a serious outbreak of Malacosoma disstria. The Datanas were in outbreak numbers in New Jersey and Connecticut. Alypia octomaculata was also a severe pest in southwestern Connecticut.

PROCEDURES IN SUMMARIZING

Certain practices are followed in most parts of the following summaries, in the interests of clarity and uniformity. 1) Subspecific names are omitted except in rare cases where certain "subspecies" are very possibly full species and confusion could ensue if the full name were not given (e.g., Limenitis arthemis astyanax). Thus, Speyeria atlantis, mentioned in California, would refer presumably to subspecies irene, not to a tired individual from New England. 2) Authors' names are omitted after species names to save space. 3) Nomenclature largely follows the McDunnough Check-lists, but in order to promote uniform usage of corrected names, several names are substituted, such as Speyeria for North American "Argynnis", Boloria for "Brenthis", Limenitis for Basilarchia, Lethe for Enodia and Satyrodes.

In this year's summaries an unusual number of individual records are published without comparisons with other years. These will be wasted, in the sense of the Summary's purpose, if future comparisons based on them are not established, but we believe it is valuable to get in print a number of such records to give future field workers a basis of comparison.

C.L. Remington

by Lloyd M. Martin
Los Angeles, California

CALIFORNIA

The reports on Lepidoptera from California were not as favorable as in the past. In the northern part of the state, the season began normally at low elevations in the middle of February, then was delayed, due to storms, snow, and frosts. As the season progressed some species were out for only a short period, others were far below the normal abundance. In the mountain areas, a killing freeze the first part of June caused a two to three weeks setback. By June 20th, species were out in fair numbers, but for only a comparatively short period.

In the southern part of the state, the rains, which are the all-important factor, were normal until late January. Then when the storms were needed the most in February and March to produce moisture for the growth of plants, it turned cold, and very little rain appeared. This caused a short spring season. We received about one-half the normal rainfall for the year and only fair collecting was experienced by most collectors.

SANTA CLARA - SANTA CRUZ - SAN MATEO COUNTY AREA. J.W. Tilden's thorough report is given in full. "The season began normally in mid-February, was then delayed by storms. Snow, heavy frost and winds in late spring caused appearance of certain species to be late, and some failed to appear in numbers enough to be noticed. Summer and fall were exceptionally dry (total rainfall for the season was far below normal) and late insects mostly scarce. Specific data follow.

Philotes sonorensis appeared in Alum Rock Park Feb. 19-24, about ten days late (normal Feb. 10). Numbers were reduced, apparently because of a fire which swept the area in 1949. Another fire swept the area in 1950, and may further reduce numbers in 1951. This is, to my knowledge, the northern limit of the species. Plebeius acmon and Colias eurytheme flew at the same time in normal numbers but also a little late. Of the moths, Epirrhoe plebeculata appeared Feb. 24, possibly early (normal about Mar.1). Most early day-flying moths were scarce, where normally common. Pieris napi appeared at the normal time but in reduced numbers.

Soon thereafter inclement weather delayed collecting and apparently had a very adverse effect on some species. Callophrys dumetorum was seen first on March 31 (normal, first week in March), and the usual large numbers of this species, extending into April, did not appear. Incisalia iroides, usually common in March and into April, did not appear in numbers, but two were taken. Pieris sisymbrii, usually present in the Alum Rock area, though not in large numbers, was not found. Anthocharis sara reakirtii and Euchloe ausonides seemed to be about normal in numbers. Proserpinus clarki was not found although two trips were made to normally good territory. Only two Hesperia columbia (always scarce) were seen, at normal season early April), but neither was taken.

At San Francisco, Glaucopsyche xerxes was not taken although three trips were made. As has been suggested, it may have become nearly extinct of late. Plebeius pheres was not taken either, but Plebeius icarioides was present in good numbers at the normal time, early April. In the San Jose area, local populations of icarioides were on the wing by April 24, about three weeks late, but in fairly good numbers.

The common late spring butterflies were somewhat reduced in numbers, including Euphydryas chalcedona, Melitaea palla, and Anthocharis sara. These insects fly over such a long period that exact dates mean little. The common blue, Lycaenopsis pseudargiolus, that usually swarms from the first warm February day until early July, was seen only now and then. On the other hand, there was a larger-than-usual spring brood of Poanes melane, appearing as usual in April and May.

The bulk of the late spring species were reduced in numbers. In this area late spring merges into early summer almost without a break, the lack of summer rain causing a drying in late May and early June that is characterized by many flowers and the appearance of many species of butterflies. This year most of these were of common sorts. A number of the choice items were either absent or few. Strymon auretorum was not seen. Strymon dryope was greatly reduced in numbers and appeared in Mocho Creek (Alameda County) and in Arroyo Bayo (Santa Clara County) the second week in June, about five weeks late (normal, early May). Strymon californica was so scarce as not to be seen, very unusual for this normally abundant species. Strymon saepium on the other hand seemed present in about usual numbers. In 1949 Hesperia juba and lindseyi appeared in the same general areas in June. None was seen in 1950. The late emergence of Glaucopsyche lygdamus seemed a little better than last year, rather strangely, since the early flight was overlooked completely by me. Melitaea leanira seemed to have a good year and rather more than usual of this infrequent species were seen.

In the Santa Cruz Mts., Speyeria callippe was out in numbers at Alma (Santa Clara County) May 30 - June 11, normal time. Speyeria coronis was nearly absent, however, but two seen. Alma, incidentally, is the type locality. Thorybes pylades was present, time normal, numbers reduced. Erynnis tristis and E. propertius were present in usual numbers; E. afranius was nearly missing. Papilio rutulus and eurymedon straggled along through the year but not in the large numbers often noted.

In the Silver Creek area of the Mt. Hamilton foothills Tharsalea arota, Minois alope, Minois silvestris, Lycaena xanthoides, Lycaena gorgon and Pieris napi, normally out about June 1, were delayed until mid-June and all were scarce except the ever-abundant xanthoides, which very seldom fails to appear in numbers. Arota was especially scarce. This may have been due to the dry weather which caused Grossularia to drop its leaves early, part of them falling in late May.

Other trips at this time were too casual to yield dependable data. A trip to Big Sur, Monterey Co., in search of Incisalia doudoroffi failed because of fog.

In Santa Cruz Co., late June usually brings at least some Speyeria adiaste, though never many. This year only one was seen, near Boulder Creek. In this region all butterflies were scarce except Precis coenia, which seemed more than usually abundant, with

FIELD SEASON SUMMARY 1. SOUTHWEST - cont.

numerous larvae on plantain. Habrodais grunus was not found. This is not too surprising since this species is rare in some years and abundant in others. It appears to go in cycles but what the length of these cycles may be is not clear yet.

Midsummer conditions were exceedingly dry and hot. Apodemia mormo appeared in Alum Rock Park in late July and early August, normal time, but in small numbers. The usually abundant summer brood of Plebeius acmon was nearly absent. Summer collecting seldom yields much here.

Fall collecting was less productive than usual. Ochlodes sylvanoides flew in large numbers from mid-July to November, as usual. But Hesperia harpalus, Erynnis tristis, Poanes melane, and Polites sabuleti were scarcer and rather more irregular in appearance than usual, straggling along rather than appearing in well-marked broods.

On the other hand, late fall was marked by open moist weather due to early rains, without frost, and up to December 10, Atalopedes campestris, Hylephila phylaeus, Vanessa carye, Colias eurytheme, and Pyrgus communis were commonly seen in yards in town (San Jose). Lawn moths (Crambus spp.) are still active (Dec. 15) and coming to porch lights.

In the Santa Cruz area, midsummer was unproductive except that Hesperia dodgei was located in fair numbers about twenty miles north of the classic locality. Careful search of the entire area from Capitola to Halfmoon Bay failed to yield other records. Numbers were taken near Waddell Creek, Santa Cruz Co., in mid-August, fresh and mostly just coming out, about three weeks later than the norm of July 17 noted at Twin Lakes in the City of Santa Cruz, the former metropolis for the species. I believe the species to be extinct on the type locality, which was vacant lots near the home of the late E.A. Dodge in the King Street section of Santa Cruz. This place is now solidly built up. The Twin Lakes colony may also be extinct, as I have found none there since 1942. Building and regular burning of vacant lots seems to have nearly or quite exterminated them. Most of this burning is done under city orders to abate weeds.

Danaus plexippus was locally scarce, and was not seen migrating in large numbers, although some passed through yards in San Jose in September. A wintering aggregation at Sant Cruz seems to have fared badly because of a fire in a grove at Swanton Beach. This matter was of sufficient interest to be written up in the Santa Cruz papers and caused subscribers to write letters of protest about the fire."

MT. LASSEN, MT. SHASTA, CASTLE LAKE AREA. At Mt. Lassen, July 27, D.L. Bauer found Gnophela latipennis, Parnassius clodius, Speyeria egleis oweni, Plebeius icarioides abundant.

Ford reported cold weather and late snows on Shasta July 4th, with Lepidoptera much delayed; Parnassius clodius, Pieris sisymbrii, Oeneis nevadensis, the early Speyerias, Callophrys dumetorum, Plebeius icarioides, and so on were just emerging. 1931 records showed the same species in that stage by mid-June. Pseudohazis eglanterina was flying July 5th near Weed. Bauer found in abundance July 28 Pieris beckerii and occidentalis, Parnassius clodius, Speyeria egleis oweni, S. hydaspe, S. callippe rupestris, Nymphalis milberti, and the Aegeriidae: Synanthedon fragariae and S. mellinipennis.

Ford likewise found the Castle Lake vicinity behind normal years. On July 17-18 P. clodius was common, P. smintheus was just emerging. O. nevadensis, Coenonympha californica, and several Speyeria were numerous; also flying were Melitaea hoffmanni and whitneyi, Polygonia zephyrus, Lycaena nivalis and mariposa, and Plebeius anna, aquilo, acmon, and icarioides. Ten days later Bauer again found P. smintheus, O. nevadensis, S. callippe (females) and others; S. atlantis dodgei and Phyciodes campestris had become the most abundant butterflies.

CENTRAL - WESTERN AREA. In late June in Mariposa Co., Tilden found extreme dryness, with Parnassius clodius common, Speyeria hydaspe, Erynnis callidus, Plebeius saepiolus, Boloria epithore, Polites sabuleti, and Annaphila spp. all rather scarce; at light nothing but a few Stamnodes appeared.

At the same time in Madera Co., Speyeria callippe was common but worn, indicating about an average flight period. Minois silvestris was also badly worn and Plebeius acmon was common.

On June 27-28, in the Greenhorn Mts., S. callippe was very worn, normal for that date; the other low altitude species (Strymon california and saepium, Tharsalea arota, Melitaea palla, Euphydryas chalcedona)were similarly worn. Higher up, Mitoura nelsoni was common and fresh; Polites sabuleti and Plebeius saepiolus were fairly common, and Speyeria hydaspe was just beginning to emerge.

In Kern Co. at the same time conditions were very dry. Colias eurytheme was abundant, with a few Ochlodes. Lycaena xanthoides was very common at Monlith, with a few L. rubidus.

At Mono Lake at the end of June Tilden found Plebeius icarioides, P. saepiolus, Strymon californica, and Callipsyche behri rather common; Polites sabuleti, P. sonora, Speyeria nevadensis, Limenitis weidemeyerii, and Melitaea acastus were scarcer. Coenonympha ampelos seemed to have been eliminated by overgrazing by sheep. One month later Bauer found all species scarce; only 2 fresh ♀♀ of Speyeria nokomis were found, where both sexes often abound. When Tilden returned in mid-August, a few S. nokomis, P. saepiolus, and Ochlodes sylvanoides were found. Conditions were bone-dry and collecting very poor. At Leavitt Meadows, he found O. sylvanoides, P. sabuleti, and Hesperia harpalus common; L. rubidus was scarce, and nothing else was seen. At Bridgeport, C. ampelos was worn; P. saepiolus, P. sonora, and Phyciodes montana were present.

Near Mt. Whitney Bauer found Plebeius aquilo and Polites sabuleti common in late July, with a few L. rubidus and Parnassius smintheus.

At Tioga Pass Tilden found conditions too cold in late June, but in mid-August Speyeria mormonia, P. saepiolus, P. sabuleti were common; Lycaena editha and mariposa were scarce; Colias behrii, often very common, was very scarce; several normal species, like Lycaena nivalis, were not found.

At Soda Springs, Nevada Co., on July 25, Bauer found L. editha, L. mariposa, L. cupreus, L. nivalis,

Satyrium fuliginosa, Plebeius anna, P. saepiolus, P. icarioides, Boloria epithore, Phyciodes campestris and montana, Melitaea hoffmanii, and Speyeria spp. in fair numbers.

Weber found Plebeius emigdionis very common and earlier than in 1949 at Victorville April 22 and 29; Pieris protodice, Euchloe creusa, and Pseudocopaeodes eunus were also common then. At Frazier Mt. Park May 13, he found Plebeius icarioides and Phaedrotes piasus common; Plebeius melissa, Anthocharis sara, and Colias harfordii were scarce. In the Greenhorn Mts. June 12, Weber found Heliopetes ericetorum, Mitoura nelsoni, Strymon saepium, S. californica, Incisalia iroides, Lycaena xanthoides common; Strymon melinus, Incisalia eryphon, Tharsalea arota, Melitaea palla (worn), Nymphalis milbertii, Speyeria hydaspe (♂♂) were scarce.

At Bartel, north of Mt. Lassen, Weber found Speyeria zerene, S. hydaspe, Boloria epithore, Melitaea palla common July 2; Mitoura johnsoni, Nymphalis californica, Oeneis nevadensis (worn) were scarce.

SOUTHEASTERN AREA. On June 20, S.S. Nicolay and L.M. Martin found Pseudocopaeodes eunus in full flight (some worn) at Olancha a week or two later than in average years. At Darwin Falls, June 19, Ochlodes yuma was out in fair numbers. At Bishop Creek (el.8,110 ft.), June 20, Euphydryas olancha, Melitaea acastus, Phyciodes campestris, Plebeius icarioides, Hesperia idaho, H. juba, Thorybes nevada were found, but no moths came to light; a freeze in early June had killed many insects here; the season was perhaps two weeks late.

LOS ANGELES - RIVERSIDE AREA. Although this is the region most heavily populated by lepidopterists, the reporting was extremely disappointing. The lone summary came from Weber; fortunately it is extensive and detailed.

At Little Rock it was cold and wet for the first three weeks of Jan. On Jan.1st a few diurnal moths were flying; many Megathymus yuccae larvae were found in Joshua Trees. Again at Palmdale, Feb.22, the diurnal moths were found, as well as a few fresh Pieris beckerii (normal date). By Mar.19, in the Gavilan Hills (Perris), Plebeius acmon, Mitoura loki, Apodemia mormo, Euphydryas chalcedona, Melitaea gabbi, Pieris protodice, and Colias eurytheme were common. Callophrys dumetorum (worn) and Anthocharis cethura (♂♂) were scarce and Euphydryas editha was uncommon and local. Conditions were about average for this date.

In the Providence Mts. Dr. Hulbirt had found Callophrys comstocki and Incisalia fotis in good condition in early April. By the 14th both were very worn, as were Euphydryas hermosa and Mitoura siva. Chlosyne californica, Melitaea neumoegeni, M. alma were fairly common.

April 22 and 29, Plebeius emigdionis and Pseudocopaeodes eunus were found common along the Mojave River at Victorville, San Bernardino Co. Pieris protodice and Euchloe creusa were not as common as in the past years. This is about the normal time of year for these species to appear in this area.

In the Phelan area, April 22 and 29, Melitaea wrightii and leanira were found in numbers in good condition along the hillsides. Melitaea neumoegeni just coming out but in good condition. Philotes speciosa was rare with only one being taken; this species is found more commonly further out on the desert in the Kramer Hills. Plebeius icarioides was not as common as in past seasons but still in good numbers. Glaucopsyche lygdamus and Callophrys dumetorum were in poor condition. Mitoura siva were fairly abundant in the Juniper trees but in poor condition, probably normal for this date.

In Beverly Glenn Canyon, Los Angeles Co., on May 7 and 10, Vanessa atalanta, Melitaea gabbi, Anthocharis sara, and Coenonympha californica were out as normal. Calephelis nemesis is occasionally found here, one specimen being taken at this time.

In Sespe Canyon, Ventura Co., on May 13, A. sara and Colias eurytheme were out as usual with C. harfordii and Papilio rutulus. Season about normal for appearance but subnormal for numbers.

In the Bouquet Canyon area of Los Angeles Co. the season was about normal in spite of the lack of rain. Speyeria callippe, Plebeius acmon, P. monticola, P. rutulus, M. gabbi, Incisalia iroides, Hesperia lindseyi and Heliopetes ericetorum were found quite common on May 20.

On Sept.9, the second brood of Apodemia mormo was common on the Angeles Crest Highway in Los Angeles Co. Normally this second brood is not as heavy as the earlier emergence in April and May.

SAN DIEGO AREA (Thorne and Creelman). For the second winter in a row, January brought freezing temperatures to all but the most favored spots, but with little injury to Lepidoptera. The spring season actually was somewhat early with Incisalia iroides appearing on February 18 at El Cajon and Euphydryas editha starting to emerge February 21 at Otay. Spring flights of all butterflies were light and continued so throughout the year due to drought. The desert areas were particularly poor, although a few species such as the desert race of Euphydryas chalcedona appeared in good numbers for a short time (Mar. 31, Box Canyon). Curiously enough, larvae of this race starved to death on the preferred food plant of the parent species here, Scrophularia californica. Caterpillars generally were hard to find all year long.

On April 15 at Desert Springs, Los Angeles Co., Apodemia mormo was abundant and Melitaea neumoegeni and M. leanira in good numbers on the few flowers present. Here again it was a restricted nectar supply rather than abundance of butterflies.

A sharp late frost in the mountain areas around May 1 contributed to light flights there, although around what few moist spots there were in mid-June Speyeria coronis, Adelpha bredowii, and other species were fairly numerous due to restricted water sources. The Palomar Mountains were poor in July but a few Pyrgus xanthus were there. Speyeria callippe appeared normally about May 21; it seems to survive drought better due to the ability of the particular violet it favors to withstand dry years.

It was a disastrous year for forest fires; one fire in August burned over 100 square miles of brush and timber including some of the heaviest stands of trees in the Cuyamaca Mountains.

There was no fall flight of double brooded species noted in desert areas, and even the skippers which seem to do better in dry years were below nor-

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mal. Wittman found collecting poor in Borrego Valley and saw no Chlosyne lacinia. This species was plentiful at Bard and in the Imperial Valley on September 1, and when the temperature was 123° F. the larvae still persisted in a habit, which proved fatal, of dropping to the ground when the sunflower leaves were disturbed.

Calephelis wrightii was found near Lakeside where its food plant, Bebbea juncea, occurs. This is the first record of this desert species in coastal areas.

In early August the Santa Cruz mountains were practically devoid of butterflies. It was apparent that drought conditions prevailed there.

While no doubt there was some migratory movement in San Diego County, the low population levels made it difficult to observe. Vanessa cardui and Danaus plexippus were both below normal.

Currently, at year's end, the weather has been unusually warm and summer species continue in normal flight. All stages of Agraulis vanillae were still around in late December.

Weber found Speyeria callippe and Lycaena hermes abundant at Barber Mt., June 25. At Mason Valley, on Sept.24 ("normal" date), he found Megathymus stephensi common; at Vallecito the second brood of Melitaea chara, Apodemia marginalis, and Hemiargus gyas had appeared.

NEVADA

At Mt. Rose, July 1, Weber found Nymphalis antiopa, Plebeius saepiolus, P. aquilo, Strymon californica common. Pieris sisymbrii and Incisalia eryphon were scarce, and Speyeria callippe rare and very worn.

On July 26, on the Nevada side of Lake Tahoe, Bauer found Plebeius aquilo and Thorybes nevada very common. Other species collected were Speyeria mormonia and "montivaga", Euphydryas nubigena, Phyciodes montana, Nymphalis milberti, Incisalia eryphon, Satyrium fuliginosa, several spp. of Lycaena and Plebeius, Hesperia idaho, Polites sabuleti, and P. sonora.

At Mt. Charleston, near Las Vegas, Weber found Speyeria coronis common (♂♂ worn, ♀♀ fresh), Minois alope and Plebeius icarioides common but worn, and Neophasia menapia scarce, on July 28.

ARIZONA

Bauer's very detailed report for Arizona follows essentially in full.

Collecting began Feb.26th, at Yarnell Hill in the Weaver Mts., Yavapai Co. The day was cloudy and not many specimens were taken, aside from about 30 Hemileuca electra larvae, Anthocharis pima and Plebeius acmon. During the following few days a little collecting was done in the Yuma area. Around Yuma only Pieris protodice were seen and an hour spent collecting moths at light gave no results. On the return trip from Yuma collecting was again done in Congress Junction, Chlosyne californica and Plebeius acmon were taken, while Yarnell Hill yielded Anthocharis sara, Pieris sisymbrii and Lycaenopsis pseudargiolus.

March 13 a little collecting was done in the mountains around Prescott with about the same species flying, but in addition, Incisalia iroides and the moth Litocala sexignata were first encountered.

COTTONWOOD REGION. The weather for the Cottonwood area can be summed up as follows: Cold weather came early last fall with a heavy frost and snow on the mountains the first few days of October. The early cold weather brought with it considerable rainfall, so that from October through December it was definitely on the wet side. The rains slacked up the last of December and by the end of January nearly all of the winter rain had fallen. One storm did bring a little rain the last of February, but from the February storm to the middle of July there was practically no rainfall. The spring and early summer were cooler than normal with a frost as late as June 7. The summer was not hot — just about average, with heavy rains during the last of July and early August, which made the entire countryside, and even the desert, green. The thunderstorms continued through August and into September. In middle September the thunderstorms stopped and only a few light showers were received from mid-September until November 9, when a cold front from the north brought 50-miles-an-hour winds and dropped temperatures to as low as 15-20 degrees (Fahrenheit) in the valleys and as low as 5° above down to zero in the mountains, thus bringing the collecting season to an end. The cold wave of Nov.9 brought low temperatures but no rainfall or snow; not even San Francisco Peaks received snow.

The above summary of the weather also applies to nearly all of Arizona. The rainfall followed a peculiar pattern this last year, which could be summed up as follows: The southern part of the state received about average rainfall, the central part above average rainfall, and the northern part well below average. Most of the summer storms did not produce rain north of the Mogollon Rim.

Collecting began in the Verde Valley the first of March, with a number of species flying by the thousands. One species is deserving of particular mention, Litocala sexignata, which appeared during March by the millions. In fact, there were so many L. sexignata flying around damp ground along the streams and the flowering shrubs that it was rather difficult to collect other less common species. I have never encountered so many of any one species except possibly Vanessa cardui in the spring of 1949 on the desert of southwestern Arizona and southeastern California. L. sexignata did not seem to migrate but were just flying in every direction, and being a day flier it would have been easy to ascertain if they had been migrating in one particular direction. I encountered them first in numbers on what is called Yarnell Hill in the Weaver Mountains, Yavapai Co., on March 2, and by the middle of March they were flying at their peak in the Verde Valley and lower slopes of the mountains. At higher elevations they remained on the wing well into April. Then they disappeared and none were seen until about the end of September, when a few were observed at about 5,000 ft. elevation on Mt. Mingus.

This was my first full collecting season in the Verde Valley area so I cannot compare this past season with former years, but it seemed that there were a great many spring species that were very abundant. Among the butterflies the following species were found in great numbers: Anthocharis sara, a species of Melitaea, the exact species or race not yet determined but belonging to the gabbii-acastus-neumoegeni complex. Incisalia iroides was also very abundant, being second only to L. sexignata. It was particularly abundant along lower Oak Creek. Other species that were flying in considerable numbers were: Pieris sisymbrii, Celotes nessus, Lycaenopsis pseudargiolus, Zestusa dorus, Thorybes pylades, Pholisora mejicanus and P. ceos, Erynnis lacustra and E. horatius.

Other species that were present but not in the number of those mentioned above were as follows: Papilio ajax appeared in fair numbers in the spring and then a few were seen throughout the summer and as late as the end of September, but were not as numerous during the summer and fall as a year ago. Papilio daunus was also less common during the summer and fall than a year ago, and Papilio philenor followed the same pattern. Pieris protodice was one of the first to appear in the spring and continued in fair numbers until the cold wave in November, as did also Eurema nicippe, although E. nicippe was considerably more abundant than P. protodice. P. sisymbrii, as noted above, was abundant only in the spring while P. rapae, although more numerous in the spring and early summer, also flew late in the fall (November). Eurema mexicana flew in the early summer and a few in the fall. As stated above, Anthocharis sara was very common last spring over most of the central mountainous part of the state. And Euchloe creusa was found in fair numbers at between 4,000 and 5,000 ft. on Mingus Mountain.

The first Satyridae to appear in the Verde Valley area was Neonympha dorothea, which was first observed about the last of May at about 4,000 ft. elevation at the base of Mingus Mountain. No other Satyridae were observed until the 1st of September, when Neonympha dorothea became abundant at 5,000 ft. elevation, along with Minois meadii and Gyrocheilus patrobas. The September Satyridae flight continued throughout most of the month and N. dorothea was still on the wing in October, though in damaged condition.

Danaidae were not very plentiful, particularly D. plexippus. A few were seen throughout the entire collecting season. D. berenice was much more common, although the fall brood was considerably less than a year ago. Nearly all Danaidae had disappeared from the Verde Valley area by the 1st of November.

Nymphalidae were off to a good start in the spring, but most of the species showed a decrease in numbers during the summer and fall. Polygonia satyrus was fairly common in the spring as were other overwintering species such as Nymphalis antiopa, and Anaea andria. Vanessa cardui did not make a very good showing; during most of the year more specimens were seen after the first cold snap than during the rest of the season. The rest of the Vanessas were also not well represented. All three species of Limenitis were in about their usual numbers. Euphydryas were much below the numbers of a few years ago, as were also Melitaea fulvia, M. pola, but the Melitaea of the gabbii-acastus group were abundant during most of March. Late in September two specimens of M. theona were encountered at about 5,000 ft. on Mingus Mountain. The Phyciodes species were about the same as numbers went. Euptoieta claudia made a good showing in the spring and early summer but fizzled out in late summer and autumn. Asterocampa leilia made a very poor showing in spring and early summer, showed a definite increase in late summer and were out in good numbers by September. Adelpha bredowii was out in good numbers most of the year, although down a little from previous years. The Chlosyne got off to a good start and continued to increase until mid-October. No Junonia were seen this season. Libytheana bachmanii made a very poor showing this past season with only a few specimens being observed now and then throughout the year. Riodinidae were present in their favored months in good numbers. For the first time Apodemia mormo was found down in the floor of the valley. In October Calephelis nemesis was taken for the first time at the southern end of the valley near Camp Verde.

Lycaenidae did not in general make too good a showing this past year, the single exception being Incisalia iroides which appeared in untold thousands during March. Of the remaining 14 species the following are the only ones that appeared in fair numbers: Leptotes marina, Brephidium exilis, Plebeius acmon, and L. pseudargiolus.

Several species of Hesperiidae made a wonderful showing in the spring. Among them were Zestusa dorus (early summer), Heliopetes ericetorum, Celotes nessus (spring), Pholisora ceos and mejicanus (spring), Erynnis lacustra and horatius (spring), E. juvenalis (early summer), Hesperia woodgatei (Sept.). Most other Hesperiidae were out in good numbers, but all species were absent or much reduced in numbers in late summer and fall except for Pyrgus communis, Copaeodes aurantiaca, and the following species which were not seen in the spring and seem to be summer and fall species; H. ericetorum more abundant in Sept. than in spring, Erynnis pacuvius taken only in Aug., H. woodgatei taken only in Aug., Sept., and Oct. Other species that seem to be only summer and fall species are Hylephila phylaeus, Atalopedes campestris, and Lerodea eufala.

Megathymidae made very good to fair showings this past season. M. yuccae was out in fair numbers in March and April. M. polingi made a fair showing in September, although less than last year, and M. neumoegeni was out in usual abundance in early Oct.

Moths had a fairly good season with of course Litocala sexignata heading the list for abundance. About thirty Automeris pamina emerged from the cocoons of larvae collected last fall. The A. pamina larvae took a nose dive in numbers this year, only one larva being found where last fall forty or fifty were collected. During July and August moth collecting was good, with many species being taken, but most of them are still unidentified. Among those taken were Dictyosoma elsa, and of course Celerio lineata and Phlegethontius sexta and quinquemaculata. Adelocephala heiligbrodti was flying during most of the season but its peak was the first of August. One male was taken as late as November 5. Among the Arctiidae the only species taken in the Verde Valley were a species of Crambidia and one of Cisthene, both as yet undetermined, and Pygarctia murina. No

FIELD SEASON SUMMARY 1. SOUTHWEST - concl.

Hyphantria cunea this season, but their webs on the trees showed definite decrease in numbers over last year.

Many spp. of Phalaenidae were taken. Among those identified are: Feltia annexa, Peridroma margaritosa, Trichoclea antica, Rancora serraticornis, Cyathissa percara, Stiria rugifrons, Basilodes pepita, Copidryas gloveri, Annaphila astrologa, Heliothis phloxiphaga, Schinia ciliata, Schinia sexplagiata, Grotella binda, Tarachidia candefacta, Acontia expolita, A. areli, A. lanceolata, Antaplaga dimidiata, Autographa brassicae, Catocala arizonae, and Heteranassa minor and a few others.

Of the Geometroidea the Semiothisa were the only ones that made a good showing.

Rather heavy rains fell during the last of July and 1st of Aug. over the entire southern and central portion of the state, resulting in good collecting during late Aug. and Sept. However, the northern and particularly the northeastern part of the state had little or no summer rains. 1950 was one of the driest years ever experienced in the northern section. Consequently, collecting was very poor there.

In the Upper Oak Creek and Flagstaff area collecting began about April 1. Euphydryas hermosa was not as numerous as in former years but the Melitaea of the gabbii-acastus group was abundant in Upper Oak Creek. Other spp. taken were Anthocharis sara, Glaucopsyche lygdamus, Incisalia iroides, several spp. of Erynnis, and the moth Leptarctia californiae.

During June collecting in the Flagstaff area hit its peak. Typical June species of the upper Oak Creek-Flagstaff area were Papilio rutulus, Colias alexandra, Speyeria atlantis, Melitaea pola, Polygonia satyrus which seemed to be exceptionally numerous, Limenitis weidemeyerii and Plebeius icariodes. In the Fry Canyon area the moth Euparthenos nubilis was very abundant flying about in daylight and there were literally dozens of them in the water holes.

The higher elevations of San Francisco Peaks yielded the usual species, Pieris occidentalis, Oeneis daura, Plebeius aquilo, Glaucopsyche lygdamus, and others.

In mid-June in the Grand Canyon area conditions were rather dry but several exceptional spp. were taken, among them Papilio bairdii, Coenonympha furcae, and Megathymus streckeri. Other species taken were the same as for the Flagstaff area.

On April 1 the spp. taken in the canyons of the Hualapai Mountains, near Kingman, were about the same as for Mingus Mountain, but Megathymus yuccae was much commoner, as were G. lygdamus and Pieris sisymbrii. In the desert canyons right around Kingman Melitaea neumoegeni was about the only sp. seen. A very interesting situation, and a fruitful opportunity for breeding experiments, was found in the lower canyons of the Hualapai Mts., where Melitaea neumoegeni was flying in company with the Melitaea of gabbii-acastus group mentioned above, and where typical specimens of both spp. were taken, but the larger part of the specimens taken showed definite signs of intergradation, which would lead one to conclude that the 2 forms hybridize where their ranges overlap. Specimens taken in the Cottonwood area showed no tendencies toward M. neumoegeni, and specimens from lower elevations around Kingman showed little tendency toward the typical Cottonwood form.

Conditions were also dry at the Rainbow Bridge National Monument on the Utah-Ariz. border and Navajo Mountain, Sept.1, and very few butterflies were seen. Melitaea pola was on the higher mesas, and in Rainbow Canyon Apodemia mormo, Philotes glaucon, Hesperia woodgatei, and the rare Ochlodes yuma, were taken. A little collecting was done in the Wickenberg-Congress Junction area near Phoenix on Oct. 1. The desert was dry and the only spp. taken were Apodemia palmerii and Hemileuca electra.

Nicolay and Martin found the Baboquavari Mts. very dry the first week in May, but collecting was good. 26 spp. of skippers alone were taken in 3 days; a number of other butterflies were taken in fair numbers. The most interesting was a lone male Strymon jada; this I believe to be a good record for Arizona. It was too late in the season for Heliopetes laviana, 4 specimens being taken, all poor. Moth collecting was very poor, only a few coming to light. A specimen of Oospila lesteraria was the prize of the moths. That season is the poorest for most moths, whereas it is a very good time for skippers and some of the larger butterflies.

Weber found the season a little early on May 29 in the Kaibab National Forest. Plebeius melissa, P. aquilo, and Erynnis icelus were quite common. Phaedrotes piasus was not too common (a new locality for this group).

Thorne reports a tremendous flight of Lepidoptera the last week in Aug. in the Santa Rita Mts. Melitaea dymas and perse, Asterocampa leilia, Eurema mexicana, Libytheana bachmanii and Euptoieta claudia were some of the predominant spp. No real rarities were taken. Rainfall in July was far above normal in southwest Arizona, resulting in very fine collecting.

Freeman and Daly made an expedition to Arizona Sept.7-12, primarily for Megathymus larvae and adults. In Madera Canyon (Sept.8) the common spp.were Papilio philenor, Gyrocheilus patrobas, Neonympha henshawi, Melitaea ulrica, Apodemia palmerii, Strymon clytie and leda, Urbanus dorantes, Erynnis funeralis, Pholisora ceos; at the entrance to the canyon, larvae of Megathymus neumoegeni abounded in agave. In Sabino Canyon, the next day, they found P. philenor, A. palmerii, S. clytie, and Calephelis nemesis common. In the Baboquivari Mts. (Sept.9), the abundant spp. were Asterocampa celtis, Eurema mexicana and proterpia, A. palmerii (and 5 A. mormo), S. clytie and leda, Pyrgus communis (and 5 P. domicella), E. funeralis, Pholisora catullus and ceos; Pyrgus philetas and Antigonus evansi were rare. At Redington and the Santa Catalina Mts. (Sept.10) the common species were A. palmerii and mormo, S. clytie and leda; of M. neumoegeni one ♂ and several larvae were taken. At Nogales the next day M. ulrica, S. clytie and leda, U. dorantes, and E. funeralis were abundant; all these but ulrica were also common at Patagonia, where Amblyscirtes nysa and eos and P. domicella were rare. In Ramsey Canyon (Sept. 11-12) they found P. philenor, Adelpha bredowii, N. henshawi, G. patrobas, U. dorantes, and Megathymus evansi and neumoegeni common; a single male Neophasia terlooti was taken there.

Contributors: D.H. Bauer; J.L. Creelman; H. Daly; R.J. Ford; H.A. Freeman; S.S. Nicolay; F.T. Thorne; J.W. Tilden; B.H. Weber.

by John C. Hopfinger
Brewster, Washington

OREGON

Prof. Macy reported that the season in western Oregon was preceded by one of the coldest winters on record, with temperatures well below zero at Portland and lots of snow, which lasted about a month. There was heavy rainfall into June, but the summer was dry and there were almost no clouds in July - Sept. and no rain.

He found Papilio rutulus less abundant around Portland than during 1949. Parnassius clodius was also less abundant, and fewer Anthocharis sara were seen and it was more difficult to find the eggs on Arabis. He saw no Colias eurytheme in the Willamette Valley. Coenonympha ampelos was present in moderate numbers, little below 1949. Vanessa cardui, so common in 1949, was rare; V. atalanta, usually rare, was abundant and numerous larvae were found. He saw no Danaus plexippus and found no larvae on milkweed. No Nymphalis californica were seen. Papilio zelicaon was not seen, but 3 larvae were found on anise.

Weber, collecting at Mt. Hood July 3, found Speyeria coronis common and fresh (only 1 ♀), S. zerene scarce, Boloria epithore common and fresh, Papilio rutulus in fair numbers, Oeneis nevadensis common and worn, Strymon melinus and Incisalia eryphon rare, Plebeius anna common and fresh, and Glaucopsyche lygdamus ♂♂ fresh and not common.

Cook reported larvae of Euxoa ochrogaster unusually far south in pest numbers, in north-central Oregon.

IDAHO

As has been the case for several years, Mr. J.R. Douglass operated a light trap at the U.S. Entomological Laboratory at Twin Falls, Idaho, and sent Dr. Cook the Noctuid material. Collecting was very poor, only about half as many Noctuids having been captured as in 1949. Only one species, Euxoa ochrogaster, was more abundant in 1950 than in 1949, and this was correlated with its outbreak in that area. Of the more abundant species, eight were as abundant as in 1949, but were at low levels in both years, while 24 abundant species were recorded as not being as abundant in 1950 as in 1949. The decline was general and seemed to affect all groups of Noctuids, so no definite conclusions may be drawn as to the effects of conditions on particular groups.

At Geneva, July 24, Weber found Minois oetus, Lycaena rubidus and heteronea, Coenonympha ochracea, Euphydryas hutchinsi, Parnassius smintheus, and Speyeria atlantis and zerene common and rather fresh; a worn Callophrys dumetorum was taken.

WASHINGTON

EASTERN AREA. At Orcas Island (Puget Sound), Macy found Nymphalis milberti, Speyeria zerene, Oeneis nevadensis, Papilio rutulus and P. eurymedon fresh and in fair numbers in late June and early July. Not one Limenitis lorquini or Vanessa atalanta was seen; in August of 1928 he saw hundreds of both. No Nymphalis californica were seen.

On July 4 Weber found Parnassius clodius very common near Mt. Rainier Nat. Park.

WALLA WALLA AREA. Dr. Cook's report follows in full.

Following the coldest winter on record, the spring was slow and the summer cool. The first eight months of the year were all below normal in temperature. Rainfall was above normal except in May. Noctuid collecting was very poor. Only the light trap at the wireworm laboratory was operated, and no miscellaneous collecting was done.

Several common species, including Euxoa sponsa, E. messoria, E. septentrionalis, A. vetusta, Feltia ducens, G. c-nigrum, and Leucania farcta increased considerably over 1949, but in general were below normal in abundance. Scotogramma trifolii, Septis arctica, Crymodes devastator and Platyperigea extima were far below their usual abundance, as were all of the common Autographas. Heliothis obsoleta, which was so reduced by the winter of 1948-9 that no damage at all was seen until late in the fall of 1949, staged a partial comeback. Late corn was heavily attacked by the earworm unless dusted. Euxoa ochrogaster is a species of northern distribution, being of economic importance in the Prairie Provinces of Canada, and in Montana and North Dakota. It generally occurs in Washington, but is rarely abundant. During 1950, the writer saw larvae of this species which were found in economic numbers in the Yakima Valley, around Walla Walla, in north-central Oregon, and in the Twin Falls area of southern Idaho. This represents a large temporary extension of the economic range of this species. Ceramica picta, which always occurs here, was found attacking lettuce in the fall.

NORTH-CENTRAL AREA (Hopfinger). The winter '49-'50 will long be remembered as the coldest recorded in many years. The ground was bare for a week in the first part of January, with below zero temperature every day. The extreme cold lasted well into February, with about a foot of snow on the lower levels. Snow lasted well into March. Very few butterflies showed up in the spring, and few specimens were taken. Euchloe creusa, usually fairly common in April, was absent, as well as E. ausonides. Anthocharis sara was found sparingly, together with Pieris sisymbrii and beckeri. During May, some of the Lycaenidae began showing up, but nothing like the numbers taken in previous years. Most Papilio continued scarce as in previous years, and not over a dozen were seen. Speyeria also were very scarce. Oeneis nevadensis, true to its two-year cycle, showed up very well. Polygonia was nearly totally absent. In some 500 miles of collecting trips, not over a hundred specimens were taken. The one bright spot in this year was the best flight of Papilio oregonia we have had here in the last ten years. In the flower garden at my house, from one to a dozen could be seen at any suitable time. The heavy flight contin-

FIELD SEASON SUMMARY 2. NORTHWEST - concl.

ued from the first part of August well into September, and the specimens were in very good shape. Moths were scarce during the whole season. The one exception proved to be Catocalae, which were fairly plentiful and late in September could be seen flying in the daytime. All in all, I would call this the poorest season we have had here in some 40 years' collecting.

BRITISH COLUMBIA

VANCOUVER ISLAND. A model summary report was prepared by Mr. Guppy, presented in full as follows.

Weather.- The '49-'50 winter was the second in succession in which unusually severe weather was experienced. It was colder than '48-'49, in fact the coldest since local weather records were first kept, a matter of about 40 years. It should be noted though, that the snow was deep enough to prevent the ground from freezing. Insects wintering in, or on, the soil may not have been affected. The spring was late and cool, but by June things were normal. The three summer months were very favorable. Above-normal rainfall, recorded by weather stations, mostly came in heavy downpours over short periods. There were more fine sunny days than usual.

Population Changes.- Papilio rutulus and eurymedon were much reduced in numbers from the two previous years. Also their appearance was very late, early June instead of mid-May. P. zelicaon was not quite as scarce as usual. The long period over which this species was on the wing is very remarkable. First seen May 23, last September 15. Other individuals were seen all through this period. Parnassius clodius remained very abundant for the second successive year. Neophasia menapia, which in '48 and '49 had been coming back after complete disappearance, seems to have stopped at a level much below its one-time abundance. Minois alope appeared less common than usual. Oeneis nevadensis showed a very remarkable increase. Speyeria hydaspe, usually rather scarce at sea-level, became very common. Specimens were seen earlier than usual. S. zerene, usually the commoner of the two, had almost disappeared; only 3-4 specimens were seen. Boloria epithore appeared slightly more abundant than formerly. Polygonia faunus was seen more often than usual at sea-level, where I have the most opportunities for observation. This is a very good example of the way in which records of butterfly population might be misleading. I had found P. faunus very abundant on the lower slopes of Mt. Benson when I collected there in June 1949. Both then and during the spring of 1950 I visited the same area and found very few specimens present. P. oreas has definitely fallen in numbers. Nymphalis antiopa showed some increase; it has usually been very scarce here; specimens were seen in both spring and fall. Vanessa cardui disappeared entirely. Apparently none of the offspring from the large migration of 1949 survived the winter and there was no fresh influx. Strymon melinus was much more abundant than usual, both spring and summer broods. No Saturniidae were seen. Smerinthus cerisyi was less common than last year. Hemaris diffinis was fairly abundant again after several poor years. Both species of Celerio were again absent. Arctia caja failed to appear. Halisidota argentata seemed to have died out; it was very common up to 1948. Other common Arctiidae were less abundant than in previous years. Perhaps worth recording is the rearing of three specimens of Aemilia roseata. I have found one or two larvae each year, for some years, but always failed to secure adults. In Oct. 1950, while cycling between Wellington and Nanoose, a distance of about 7 miles, I picked up 9 larvae crossing the road, fairly evenly spaced along the distance. All my larvae cocooned, but some were parasitized; only 3 adults emerged. Several Orthosia sp. were taken. I had taken only one in several years. A marked decrease in Geometridae was noted.

Weber encountered rain all across B.C., but on July 10 at Princeton, he found: Speyeria zerene (1♀), Minois oetus, Pieris occidentalis common and fresh; Speyeria callippe and Coenonympha inornata common but worn. The next day, near Boat Encampment, Limenitis arthemis, and Papilio glaucus were common. At Yoho National Park July 13, Plebeius melissa was common in colonies, Erebia epipsodea common but ragged, and Speyeria atlantis present but scarce.

Contributors: W.C.Cook; R.Guppy; R.H.Macy; B.H.Weber.

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

by Donald Eff
Boulder, Colorado

As I begin the task of attempting to set down on paper the consensus of opinion of the various collectors in this area, it occurs to me that if the Lepidoptera of this area continue the trend of the past two or three years, it will greatly simplify this report. All I'd have to do is to send in a blank sheet of paper. However, coverage of conditions for the season just past was not equal to that of the previous year. By this I mean that the resident collectors, for one reason or another, were not as active afield as they have been in the past. There is only one report by a non-resident, but that an excellent one by B.H.Weber of Burbank, Calif., who made a trip up the western coast to B.C. and then inland to Banff, Alta., and home via Waterton Lake, Montana, Wyoming, Idaho, Utah, and Nevada.

In Colorado and New Mexico there was very, very little snow during the winter of '49-'50, and the weather was of a mild nature for a mountainous area. The first entry in my Colorado collecting diary shows the date of Feb.26, when the various hiberna-

tors were flying, including a couple of Anaea andria. The first collecting usually begins with the turning of the calendar to April, but opened about a week sooner than that here. Callophrys sheridani showed up in greater numbers in this early spell, but Incisalia schryveri faded completely; only a couple specimens were observed. Aside from this one brief early flurry, our spring seems to have coincided entirely with the balance of the area in that the appearance of the usual spring species was two to three weeks late. As pointed out by Brown, it was just too dry for things to get going. Up in Alberta they experienced a bitter cold spell during the entire months of January and February when the thermometer never got above zero (Fahrenheit) and often dropped to 40° below. This may have been the cause for the tardiness of the season there. Here a heavy, wet snow on May 25, followed by freezing temperatures, caused a considerable decline in species that had been flying before that date. June was reported as not very good, the scarcity of even the most common things being plainly noticeable. July weather in Colorado, and as a whole in most of the mountainous states, follows a fairly definite pattern. The mornings are usually clear, with the afternoons becoming cloudy, and with occasional scattered showers over the mountains, but such was not the case this year! There was a total of only 3 good collecting days during the entire month, and probably not more than a dozen days when even a couple hours of poor or fair collecting could be engaged in. This was not true of the whole state, but it certainly seemed to be true of the eastern slope, where the weather showed an ever-threatening mood, but failed completely to materialize into the sorely needed rainfall. Following the extremely mild winter with this lack of moisture, and the rapid disappearance of what little snow there was in the high country, there soon existed in the alpine country an arid condition unmatched in the memories of the old-timers. It is safe to say that at least three-fourths of the little mountain streams were bone-dry this year, with the consequent diminishing of the necessary foliage. Some rains in September and early snow, especially in the higher mountains, has brightened the prospects as far as moisture is concerned for next year, but the outlook with regard to the insect population, as the result of the past summer's dryness, isn't healthy.

Of first and most notable importance when comparing this season with previous ones, is the fact that the swarms of Vanessa cardui and Celerio lineata that appeared last year were lacking in the summer of 1950. Also there was a decided scarcity of a good number of the commoner species, for one reason or another. On the other hand, the various reports show an unusual number of captures of stragglers, and reappearance of species missing for as long as ten years.

In ALBERTA Bowman, the only resident collector, noting the aforementioned bitter cold spell, the scarcity of the common species, and the occurrence mostly in singles of the scarcer species, especially the Noctuids, could only class the year as very poor. However, Weber, rained on most of the time he was in the Canadian Rockies, finally got in some collecting at the Waterton Lake National Park and found some species quite plentiful. Of particular note as common were Speyeria atlantis, S. zerene, S. hydaspe, S. cybele, Parnassius smintheus and Coenonympha inornata. Boloria selene (= myrina) were common in one spot and Oeneis chryxus also was fairly plentiful. Most of the other species, such as Colias christina, Limenitis arthemis, and Everes comyntas, were few in number.

From MONTANA, Weber's is the only report. Here he collected just below Glacier National Park and again at Monarch and White Sulphur Springs. Collecting conditions at the first two spots did not permit much observation, but he did find Melitaea palla common. However, at White Sulphur Springs he found Plebeius icarioides and melissa, Parnassius smintheus, Lycaena helloides, Coenonympha haydeni, and Minois oetus all fairly common on an open hillside covered with sagebrush and the usual accompanying semi-desert vegetation; two fresh Satyrium fuliginosa were taken.

In WYOMING there are reports from Downey of Sheridan and Glasgow of Daniel, plus the report of Weber on Jackson Hole Nat. Monument and Afton. Glasgow, at Daniel in the western part of the state, is near Pinedale, the town that is properly known as the "icebox of the nation". He reported that collecting did not even start until mid-June. No species was abundant, although he took more specimens than last year. For the first time in 10 years he saw some Parnassius. He found an Apantesis larva crawling around at 18° (F.) below zero March 30; it later pupated and hatched. Downey's collecting was interrupted in late June by a broken wrist but he got in some moth collecting and notes that the Catocalae were in good numbers, at least for a western state. At Jackson Hole, July 22-23, Weber found the best collecting of his entire trip. On Signal Mt. Speyeria egleis was common, as was mormonia; several of the Blues were in good numbers, including melissa, icarioides, and heteronea; also Melitaea palla and Minois oetus, and Coenonympha haydeni; Satyrium fuliginosa was fresh and common in one spot. At Afton, in the sagebrush, near the river, he found Lycaena heteronea and helloides common, as well as Plebeius icarioides and Minois oetus. Near Moran, C. haydeni was extremely common and fresh (both sexes), Parnassius clodius and Boloria kriemhild common and worn.

In UTAH, we are again indebted to Weber for the only report. While collecting in Zion and Bryce Parks and the north rim of the Grand Canyon, May 30, he found Plebeius saepiolus and Phyciodes mylitta abundant, Heliopetes ericetorum in fair numbers, and Colias alexandra just emerging. In Salt Lake City the end of July, the commonest species were Speyeria zerene, Lycaena heteronea, Pieris napi, and Poanes taxiles. Speyeria egleis, Hypaurotis chrysalus, Callipsyche behrii and Strymon saepium were scarce. At Cedar Breaks Nat. Monument he found P. napi, and Speyeria atlantis fairly common.

In COLORADO, we have reports from Minor on the western slope of the mountains, Renk, Schryver, Brown, and Eff on the eastern slope, and a note from Rotger, at present in Durango, but formerly in

FIELD SEASON SUMMARY 3. ROCKY MTS. - cont.

Capulin. Minor also notes the scarcity of V. cardui and C. lineata. Schryver states that Parnassius, Speyeria and Papilio seemed quite scarce. The only thing he found in good numbers was Erebia callias, of which he took over 80 above Berthoud Pass. Renk, the only one to do much collecting locally, reiterates the bad weather conditions and the poor collecting. Approximately one-half of his summer's captures consisted of Pieris and Colias. The collecting of Brown and myself was interrupted with trips East, his in April, May, and August, and mine in June. However, Brown notes the early appearance of the hibernators also, and the fact that the winter and spring were so dry that the regular season could not seem to get started. His first captures show the date of April 21 for Pieris rapae and Strymon melinus, both about 3 weeks late. Collecting was not good until the latter part of June, and from then on only fair. The results of his collecting also showed more than the ordinary amount of stragglers. These will be recounted in a subsequent paragrah. The only good collecting I found this summer was on a trip to Gore Pass, north and west of Kremmling, in Grand County. Weather on the eastern side of the mountains was typical of much of our local July weather, with the clouds almost hugging the ground and giving every appearance of an impending cloudburst, which never came. Once over Berthoud Pass and on the western slope we found the weather entirely different, it being clear with only a few scattered clouds. At Gore Pass, July 22, we found Boloria helena very abundant. Speyeria mormonia was common and Colias scudderii more common than usual in its haunts. Pieris alexandra and Lycaena helloides also were common and near Toponas in Routt County, L. heteronea was seen in more than usual numbers. The end of July Erebia callias were plentiful and rains in Sept. seemed to increase the number of Hesperia ottoe in the Rocky Flats near Eldorado Springs. August, a month when alpine collecting is usually excellent, was so dry that almost nothing flew in the high country. At the entrance to Rocky Mt. Nat. Park, Lauck reports Eumenis ridingsii common. I have some of the specimens and find them very fresh. This would indicate that they are a second brood, for the normal flight period of this species is the last week of June and the fore part of July in the higher parts of its range. Rotger reports Malacosoma in tremendous numbers at La Veta Pass and Conejos Cañon again this year. At Wolf Creek Pass he found Euphydryas eurytion and Parnassius smintheus common. However, Euphydryas carmentis seemed to be absent from the locality near Pagosa Springs, with a multitude of grasshoppers taking over.

In NEW MEXICO, the southern terminus of the Rocky Mt. Area, the only full report is by Standard, of Belen. His observations coincide in the main with those of the Colorado collectors, including the later appearance, the diminishing numbers, plus the fact that the winter of '49-'50 was the mildest and driest on record for 58 years. Spring was early (but not the appearance of the butterflies) and fall frosts were nearly a month late, with the resulting phenomena that the yucca, lilies and fruit trees bloomed for the second time. It is the first time that anyone can remember the appearance of a second set of blossoms on the yucca. In New Mexico C. lineata appeared in fair numbers, but nothing like those of last year. V. cardui was very scarce until Nov. and then appeared in good numbers. Libytheana bachmanii appeared by the thousands June 29 to July 15. Euptoieta claudia appeared to be making a comeback. This fact was also true in Colorado. Standard reports fair numbers of Ctenucha venosa after an absence of years. Last year in Colo. they were plentiful, but scarce this year. He also reports the appearance of Agraulis vanillae for the first time.

F.T. Thorne reported that extreme dryness prevailed in the Black Range (near Silver City) and around Deming in late August, with butterflies almost non-existent.

In general, a run-down of the various genera shows that the Papilio continued to decrease. Parnassius about normal with a slight increase in the high altitude forms after last year's almost total absence. Neophasia menapia continued scarce. Pieris about normal, with an increase in a couple of the napi forms, particularly in Utah. Euchloe ausonides and olympia down, but Anthocharis sara appearing to gain slightly. Colias about normal. Coenonympha and Minois down slightly. Oeneis uhleri was one that appeared in usual numbers and at the usual time, the middle of May. Oeneis chryxus came back after last year's decrease, but brucei disappeared and lucilla was almost missing. Erebias about balanced, with callias more plentiful and ethela down considerably. All Speyeria were down, as were the Boloria with the exception of helena. Apparently the flight of B. kreimhild was about normal. Melitaea continued poor, with arachne missing, palla good in the north but poor in Colo. Euphydryas and Limenitis poorer than usual. The Lycaena showed an increase in heteronea and helloides over much of their ranges. In the Theclini, the Mitouras had a bad season. Strymon saepium and Incisalia schryveri disappeared. I. eryphon continued in abundance. The scarcity of Plebeius icarioides was noticeable.

Some interesting records were noted this year. One was the aforementioned swarms of Libytheana bachmanii that occurred in New Mexico and the appearance of Agraulis vanillae there. Another was Downey's first record of a Catocala parta for his collecting in Wyoming. Brown reported the reappearance of Danaus berenice in limited numbers (June 17-20). He also captured 4 specimens of Kricogonia lyside, a new record, so far as we know, for the state of Colorado. He also took a Leptotes marina and a Mestra amymone (July 4, Bear Creek Canyon)! Eurema mexicana and nicippe were recorded from several spots, and Lester Smith, a Boulder collector, on June 14 in Gregory Canyon captured a specimen of Heliconius charitonius. My biggest satisfaction came from capturing two Melitaea damoetas after two previous unfruitful summers. They fly in the high rock slides with Erebia magdalena and Lycaena snowii and are harder than either to capture. Rotger, near Durango and Alamosa, and in Costilla County, took specimens of Apodemia mormo after an absence of years. Aside

from these interesting records, the most noteworthy was Brown's discovery of a very large colony of Boloria frigga on the western slope.

In conclusion, I can say that from all recent records, 1947 was the peak year. The following years showed decreases, and 1950 continued the trend. The entire area experienced a late beginning of the collecting season. The extremely dry winter, spring, and summer will in all likelihood cause collecting to continue poor next summer, at least in the southern part of the area where this condition exists. On the optimistic side is the fact that there is already more moisture by Jan.1, 1951, in the mountains here than at any time in the past four years. The snowfall on that date at the city watershed near the Continental Divide measured 119 inches compared with 48 inches at the same time last year and the water content is more than double that of any of the four previous years. Lack of snow and water has not bothered the northern part of the area and the outlook there, barring unusual circumstances this winter, seems to indicate the prospects of a normal season. Weather unfavorable to collecting has been one of the main villains this past summer, and it is doubtful if we will have two summers in succession as poor for collecting as this one was.

Contributors: K. Bowman; F.M. Brown; D. Downey; C. Glasgow; A.G. Lauck; W.C. Minor; J.J. Renk; B. Rotger; C.D. Schryver; O.D. Standard; F.T. Thorne; B.H. Weber.

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

by Don B. Stallings
Caldwell, Kansas

For the fourth successive year, at least in the northern half of the Great Plains, cold, wet weather delayed the flight of spring Lepidoptera. No reports were received from collectors south of Kansas.

NORTH

At Transcona, Manitoba, Quelch reported the fall of 1949 very wet and the ensuing winter "cold but not unusual. The spring of 1950 was cold and wet up to May 20th. From then on the weather was about average for Manitoba but collecting was extremely poor all year and strangely enough seemed to get steadily worse as the year progressed. ... Those species present were from two weeks to a month late." The period from May 24 to June 19 is usually one of the best of the year, but in 1950, one Lycaenopsis pseudargiolus was found May 27, nothing June 3, one Pieris rapae June 4. A few species were present in 1950 in usual numbers, namely: Incisalia polios, Lycaena thoe, Coenonympha inornata, Megisto eurytus, Boloria titania (= "chariclea"), Poanes hobomok. Some usually abundant were absent or very scarce: Strymon edwardsii, S. acadica, S. titus, Lycaena dione, L. helloides, Plebeius saepiolus, P. melissa, Glaucopsyche lygdamus, Everes amyntula, Phyciodes gorgone, P. tharos, P. nycteis, Boloria toddi, Colias eurytheme, C. philodice, Erynnis icelus, E. brizo, E. juvenalis, Pyrgus communis.

At Brandon, Manitoba, Bird also reported the spring season late, following an average winter. June 4 was the first fair collecting day and until July 10, the Lepidoptera were in good numbers. Oeneis daura alberta and Carisma garita were commoner than usual. C. inornata, P. saepiolus, G. lygdamus, Papilio glaucus, and E. icelus were in about average numbers. Less common than usual were Papilio ajax, C. philodice, C. eurytheme, P. melissa. The summer was unusually dry and hot and butterflies were scarce after July 10; especially notably reduced were Danaus plexippus, Vanessa cardui, C. eurytheme, C. philodice, Pieris protodice. During the late fall C. eurytheme and philodice were seen flying northward whenever there was a southerly wind. One C. philodice was taken later than ever before, on Nov. 10. New records for the Brandon area were Erebia epipsodea and Carterocephalus palaemon.

MIDDLE

The last part of March a cold front moved into Kansas with the front of the storm running from Fort Scott, Kansas, west and south through Dodge City, Kansas. This front became more or less stationary and held this position with not a great deal of change for nearly 3 weeks. As a result south of this line we had spring, while north of the line it was still winter. In the south part of the State the "spring" condition was static — that is, there was no particular advance of "spring". As a result of all of this the south part of Kansas produced one of the longest spring flights I ever saw. Usually Euchloe olympia flies in numbers only about 2 weeks. Last season we had them for nearly six weeks in good numbers; other spring species responded in the same manner.

However, at Ottawa, Kansas, Howe found the spring delayed, as in Manitoba. In general, he found the 1950 Lepidoptera flights in good numbers. Pieris protodice and rapae appeared March 24, Euchloe olympia Apr.10-May 7. E. olympia and Anthocharis midea were somewhat commoner than usual. Hibernated Anaea andria, Polygonia progne, P. comma, P. interrogationis were unusually numerous, appearing by Apr.2. Vanessa cardui and virginiensis were more numerous and both appeared by Apr.9. All six Papilio species were below average in spring, but P. cresphontes was common by Aug.22. Lycaenopsis pseudargiolus was common Apr.2 - May 6, Incisalia henrici Apr.10 - May 6. Hemiargus isola, far commoner than usual, flew from Apr.7 - late June. Limenitis astyanax and archippus were much below average numbers. Some ab-

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undant species were Junonia coenia, Asterocampa celtis and clyton, Eurema nicippe and lisa, Colias eurytheme, Lethe portlandia, Megisto eurytus, Minois alope (as late as Oct.5), Lycaena dione, Speveria cybele and S. idalia (as many as 3 on a small blossom), Phyciodes nycteis, P. tharos, P. gorgone.

The Sphingidae in the Ottawa area, already subnormal in 1949, were even fewer in 1950, especially Celerio lineata, Pholus achemon, Sphecodina abbotii, Amphion nessus, Herse cingulata (absent), Sphinx chersis, Ceratomia amyntor. Pachysphinx modesta and Cressonia juglandis were on the upswing. Isoparmia hageni, greatly reduced in 1949, increased in 1950 markedly. Pholus pandorus, Deidamia inscriptum, Smerinthus geminatus, Paonias myops, Sphinx vancouverensis were in normal numbers. Ceratomia kansensis was very common. Sphinx eremitoides was taken at Lawrence in August, the first in many years. For the second successive year Catocala species were at a low ebb; only C. illecta and C. innubens were common. Psychomorpha epimenis, usually very scarce, was in tremendous numbers Apr.2 - May 3.

Contributors: C. Bird; W.H. Howe; C.S. Quelch.

5. CENTRAL - MISSOURI TO WEST VIRGINIA, NORTH TO ONTARIO

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

Replies were received from 16 of the 33 collectors written to this year. There was general agreement throughout the area that this was the poorest collecting season in many years. As in 1949, we had a mild winter at first, followed by cold, wet weather which delayed the appearance of the usual spring butterflies as much as two weeks, or else they failed to appear at all. About the only family of Lepidoptera reported to be abundant were the Satyridae, which can perhaps be accounted for as due to their habitat in protected woodland areas.

In discussing this report of a "poor year" with several members of the Society at the recent annual meeting in New York City, the question was raised whether assiduous, persistent collecting throughout the season would not have revealed that the Lepidoptera were in truth as abundant as usual, but perhaps appeared later. In other words, did many of us try our usual spots at the usual time for early spring species, find the catch small and get discouraged about further collecting? The writer has determined to get out in the field more during the coming year and discover whether it is really the specimens that are rare or the collector.

MISSOURI. The spring collecting was fully two weeks late. Near St. Louis no Euchloe olympia were seen, for the second year. Its companion species, Anthocharis midea, was sparingly in evidence. The early species, such as Incisalia henrici and Erynnis brizo were not found. For several years visits to localities where the rare Strymon ontario used to be found have been fruitless and this year was no exception. It is feared that this species has almost disappeared from the St. Louis area and will have to be sought in the central Ozarks. During late summer and fall the usual procession of butterflies appeared, though never in great numbers. Phoebis sennae was seen flying high and fast in late fall and also scattered individuals of Danaus plexippus, both species flying in a southerly direction and probably starting a small migration. A field trip in the Indian Summer weather of late October in search of Lerodea l'herminier and the day-flying moth Hemileuca maia was in vain.

ILLINOIS. Lauck, our usually active collector in Alton, was limited in his collecting this year due to illness. He agrees with several other collectors in the zone that Polygonia were not seen at all this year and that all species were fewer in number. Leuschner collected almost every night at lights for moths near Urbana. In mid-April he found Leucania unipuncta, Peridroma saucia and Lycia ursaria. In mid-May Acronicta and related genera appeared in unusually large numbers, including A. interrupta, A. lepusculina, A. oblinata, A. morula, A. americana, and Simyra henrici. He also took Adelocephala bisecta and A. bicolor at this time. Sphingidae were well represented at lights but no species was common. Saturniidae were poorly represented. In late June Datana ministra was common, later replaced by D. integerrima. In October Alabama argillacea was exceedingly common. Leuschner also collected extensively in Chicago and reports the most noticeable trend was the large June flight of Sphingidae found at lights; this is in direct contrast to the report by Woodcock, also from Chicago, who saw no Sphingidae at all. Leuschner's best find was reported to be Sphinx vancouverensis. One surprise later was the almost complete absence of Catocala either at light or sugar.

Woodcock again pursued his project of observing at lights around his home throughout the season and reports that no species was found as plentiful as last year, with some absent, such as Macronoctua onusta. He intends to continue his study another year and then list his results.

INDIANA. Only Wren prepared a report from this State, and his observations were necessarily limited. He records "a remarkable assemblage of butterflies" at Brown County State Park "sitting on the mud and stones along a partially dried up creek. With the exception of some Eurema lisa, all of the butterflies were dark black, bluish, or greenish and of a similar size. This assemblage could be numbered in the hundreds of insects, including Limenitis astyanax, Papilio glaucus glaucus (no yellow turnus at all), P. ajax, P. troilus, P. philenor." Wren's observation is all the more remarkable in that he records "Papilio glaucus glaucus", presumably females. I

know of no other record of female butterflies found on moist spots like this, every other similar case being males. I once saw an "orange cloud" similar to this in Tennessee, consisting of hundreds of individuals of Eurema nicippe sipping the moisture about a mud puddle on the road. I actually caught over a hundred in one swing of the net, and they were all males. It would be interesting if other members of the Society would report on whether they have seen female butterflies at moist spots. Wren also saw Polygonia interrogationis and P. comma "swarming in an abandoned pear orchard" near Indianapolis.

KENTUCKY. There was a very mild winter here, followed by diminution in the number of butterflies, though the correlation is not clear. Merritt and Monroe teamed up on a trip to Okolona to the site of the only known locality of Calephelis borealis in this area. Four specimens were found, but the locality is being destroyed by construction, as so often happens. Other interesting finds were: Incisalia niphon and I. henrici (commoner than usual); Feniseca tarquinius, found for the first time since 1946; Hesperia metea, a new species for Jefferson County; and a series of Cecropterus cellus, the latter from Menifee County June 15. Butterflies were in general much scarcer than in 1946 and 1949.

OHIO. Romine did not find the season good until he sugared for Catocala in August and September, when he had good success. Mrs. Chase at Galion found that the warm winter with its sudden cold spells wiped out the hibernating species Nymphalis antiopa and Vanessa atalanta, as well as Pieris virginiensis. Other species were all scarce until Minois alope appeared and this was abundant and very variable in transitional forms, just as it is in Missouri. At a normally good spot for collecting under lights, there were almost no moths this year. Her reared female Saturniids did not attract a single feral male. From 56 collected cocoons of Hyalophora promethea, only two males emerged, the rest all parasitized by large ichneumon flies. Mrs. Chase also finds that Vanessa cardui, once abundant, is nearly extinct, "due to parasites", as is Nymphalis milberti. Colias philodice was very abundant in October and practically replaced the usually commoner C. eurytheme. It was still flying Nov.6.

MICHIGAN. This state was well reported. The same pattern was observed, with early collecting very poor. V. cardui was seen by Beebe apparently migrating on May 3 and Danaus plexippus on June 8. I presume the above dates would be northward migration INTO the area. Migration southward was reported for D. plexippus July 28 (when Papilio philenor and P. troilus also seemed to be migrating along the course of the Detroit River) to Oct. 26. Lithocolletis crataegi was scarcer than usual.

The detailed observations at Ypsilanti, made by Clench expressly for the Summary, deserve extensive space here. The precipitation was approximately average. A 30-day running average of mean temperature was far above normal during Jan. and early Feb.,went below normal Feb.21-May 10, slightly above normal May 10-July 4, dropping a little below again until Aug.17. Therefore, a nearly normal temperature season, with about a 10-day retardation of spring, lasting nearly three months, and no extremes in winter or summer.

Species emerging at average time at Ypsilanti were Speyeria cybele, Strymon falacer (much commoner than usual), Thymelicus lineola (less than 1948, more than 1949), Poanes hobomok. Two weeks later that usual: Pieris rapae (scarcer), Minois alope (scarcer), Phyciodes tharos (scarcer), Lycaenopsis pseudargiolus 1st brood (scarcer), Everes comyntas 2nd brood (scarcer), Lycaena phleas (scarcer), L. helloides, Polites peckius, Pholisora catullus. Others scarcer than usual were: Papilio ajax, Pieris protodice, Limenitis archippus. Others commoner than usual were: Megisto eurytus, L. pseudargiolus 2nd brood. Others in "normal" numbers were: Strymon caryaevorus, Epargyreus clarus. Notably absent were: Lethe eurydice, L. portlandia, Polygonia spp., Limenitis astyanax, Lycaena thoe. Unusual records included Strymon liparops (July 8) and S. acadica (July 8). Clench noted that most of the delayed species overwinter in open fields, all but lineola of the normal period species overwinter in woods.

Voss, collecting in Cheboygan and Emmet Counties, also took Strymon liparops for the first time, as well as S. falacer (first time), S. titus, S. acadica. Other additions to the regional list include Lycaena dorcas, Atrytone bimacula, and an Erynnis (probably persius). Hesperia laurentina and H. leonardus were abundant after several years of great scarcity. Colias interior and Lycaena epixanthe were very abundant in July. "Pieris napi was common ... for the first time in my experience; and Danaus plexippus definitely continued its increase in numbers, although still less common than nine or ten years ago." All three species of Speyeria -- atlantis, aphrodite, and cybele -- and Boloria selene and toddi were extremely abundant all summer. Voss comments: "Perhaps some of the these apparent increases in numbers were due to the fact that a much greater amount of field work was possible this year", a sage observation for all of us. A full report on the butterflies of Emmet and Cheboygan Counties, Michigan, is in preparation, with special reference to the flower preferences observed for these insects during the past seven years.

Mrs. Hynes, collecting in an area between the last two, continued her rearing of Saturniids and other moths. Very successful in "calling" males to freshly emerged females, except with Automeris io, which seems not to be present in Battle Creek. In one case a male Hyalophora promethea came in the rain as late as Sept. 11.

A new reporter, Perkins, collecting in southern Michigan, found Vanessa atalanta and Pieris rapae flying as early as May 6, and Vanessa virginiensis on May 16, all new early records for Branch County. Also on May 16 he took Papilio marcellus, a notable catch in this area. On May 27 he took Boloria toddi, the first caught in Calhoun County. Shappirio, also in southern Michigan, reported a very cold spring, with the season delayed two to three weeks for virtually all species.

WISCONSIN. The three members reporting all live in the north-central part of the State. Again the report is that April and May were very cold and the butterflies appeared about fifteen days late. Grie-

FIELD SEASON SUMMARY 5. CENTRAL - concl.

wisch reported Lycaenopsis pseudargiolus and that three species of Incisalia were unusually abundant, all taken within a half mile radius in late May: I. niphon, I. irus, and I. augustus. Phyciodes nycteis, Melitaea harrisii, and Hesperia sassacus were not found at all. Colias interior in June was more abundant than usual. Nymphalis j-album, Pieris protodice, Minois alope, and Atrytone ruricola were also very abundant. The season lasted longer than usual, producing Limenitis arthemis even later than Hesperia leonardus in late September. At Chippewa Falls Arnhold reported a scarcity of Catocala, as noted by other collectors in the zone; he found only 2 C. amestris larvae where they were numerous in 1949. The first butterfly he saw was Pieris protodice, on May 14; two weeks later Euchloe olympia was not rare. The first Danaus plexippus, a worn ♀, was seen June 8 at noon, during a period of strong south winds. Sieker reports collecting was the worst in 20 years. Satyridae were fairly normal in abundance. Very few Colias and Pieris were found. The marsh skippers more common than usual. He had fair success with Sphingidae, taking Sphecodina abbotii , Deidamia inscriptum, Amphion nessus on flowers, and at lights in usual numbers he took Ceratomia undulosa, C. amyntor, Paonias excaecata, P. myops, Pachysphinx modesta, Cressonia juglandis, Smerinthus cerisyi. Noctuidae were very scarce at sugar and Geometridae at lights. Most of the Catocala were markedly reduced, but C. cerogama was unusually common; he took one C. judith, a great rarity there. All Wisconsin collectors noted that Megisto eurytus, Minois alope, and Lethe eurydice were in normal numbers in this general poor year.

ONTARIO. Bailey, the only reporter in this area, also records an "unusual" year - a very late spring, followed by a cool, short summer and a cool autumn; no really hot days. He took the spring form of Phyciodes tharos in July, when the summer form usually predominates. P. nycteis was 2 or 3 weeks later than in '48 and '49. Euphydryas phaeton was on schedule (July 25). By the end of July things seemed to be back on schedule. Unusual catches: Junonia coenia, one worn ♀, May 14, a rarity at any time in Ontario; Eurema lisa, a perfect specimen on July 15, his first; Atrytone "arogos" in quantity about June 30, usually rare. Bailey noted a brood of dwarf Pieris rapae in mid-June, immediately overlapped by a brood of normal measurements. It may have been a delayed part of the first brood which flies in early May. At any rate, it flew between two major flights of normal-sized P. rapae and often mingled with them.

Contributors: F.R. Arnhold; E.G. Bailey; R. Beebe; Mrs. Hazel Chase; H.K. Clench; L. Griewisch; Mrs. Vonta Hynes; A.G. Lauck; R. Leuschner; J.R. Merritt; B.L. Monroe, Jr.; O.A. Perkins; R. Romine; D.G. Shappirio; W.E. Sieker; E.G. Voss; H.E. Woodcock; G.R. Wren.

6. SOUTHEAST - FLORIDA TO LOUISIANA, NORTH TO ARKANSAS AND MARYLAND

by Ralph L. Chermock
University, Alabama

Contributions for this area were few. However, much of the material was carefully collected, and proved to be interesting and significant. Unfortunately, all of the information pertained to butterflies, with no observations being made on moths. In general, the season was poor in comparison to previous years.

Fales, collecting in MARYLAND, made a series of interesting observations on the butterflies of that region. His summary of the weather conditions was particularly noteworthy. January and early February were generally mild, with record high temperatures being recorded. During the latter part of February and most of March, the weather was cooler than usual. The Weather Bureau issued the following statement: "The average for November, December, January and February was 43 degrees. But for the first 20 days of March, when the mercury is usually rising, it dropped to an average of 38.2 degrees. Only in 1931-32, when the average was 44.6 degrees, and 1889-90, when it was 44.2, has the area experienced a warmer winter than that just ended. ... As for snow ... no record was found equal to it. .... only 2 inches fell, 1/2 less than the previous record in 1930-31." The mean temperatures for April were normal, although a cold wave came during the second week; precipitation was lower than normal. May, June, July, and August had normal temperatures, with greater precipitation except for June. September was also wetter than normal and generally cooler. October and November had higher temperatures and increased precipitation. In general, the year was characterized by milder temperatures and greater precipitation.

Fales made the following observations on butterflies. A number of species appeared later than usual, such as: Euptychia cymela; Minois alope; Speyeria cybele; Everes comyntas; Lycaenopsis pseudargiolus; Anthocharis midea; Papilio glaucus; P. troilus; Proteides clarus; Ancyloxypha numitor and Strymon melinus. Apparently, the cold spell in April was significantly responsible for many of these. The relative abundance of species in relation to that of previous years, seems significant. Those species which had normal flights were Phyciodes tharos, Lycaena phlaeas, Everes comyntas, Eurema lisa, and various species of Erynnis. Papilio marcellus and Pholisora catullus were somewhat more abundant than normal. The following species were relatively scarce: Limenitis arthemis astyanax; Vanessa atalanta; Polygonia interrogationis; Speyeria cybele; Euptoieta claudia;

Incisalia niphon; Colias philodice; Anthocharis midea; Papilio glaucus; P. ajax; and Atalopedes campestris. The following species had very poor flights: Lethe eurydice; Junonia coenia; Vanessa cardui; Speyeria idalia; Incisalia augustus; I. irus; Pyrgus communis; Hylephila phylaeus; and Poanes zabulon. Vanessa atalanta, Aglais antiopa, and Polygonia comma were scarce during the summer months. In summary Fales writes "My general opinion is that it was a poor butterfly season here. This was probably due to the late spring."

Spring collecting in Maryland was reported normal in quality and date by Blevins, despite cool weather. "Mowing of roadsides by County agencies interfered with normal collecting of butterflies at flowers; perhaps for this reason, Phyciodes and Speyeria seemed unusually scarce. In Prince George Co. in Aug. and Sept., skippers were below normal numbers, with the exception of Lerodea l'herminier, Atrytone bimacula, and Poanes zabulon, which were much above normal."

For the DISTRICT OF COLUMBIA area, Shappirio wrote: "The season was unusual, as evidenced in: 1) delayed emergence, by as much as a month, of many species (e.g., most Papilio; the spring form of P. glaucus, which is often seen the first week in April, was noted the last week in May); 2) in certain limited habitats, "sensitive" species, such as A. midea spring form and also spring form ♂♂ of Papilio glaucus, which ordinarily appear in April for a week or two, either did not appear at all or had markedly reduced flight period; 3) greatly reduced numbers of certain species normally common, such as J. coenia; 4) unusually large numbers of certain species, notably M. alope. How much of each of these effects may be due to atypical weather conditions during the winter, is, of course, difficult to determine. It seems certain, however, that a definite effect was exerted by abnormal conditions before the collecting season. In the D.C. and its vicinity, I observed unusually large numbers of M. alope throughout the summer, both by personal observation during June and in August and September, and by reports from persons collecting there then and in July. The species was particularly common in eastern and southern Maryland, Anne Arundel, Montgomery, Prince Georges, and Calvert Counties. Ordinarily, the species is seen in or near woods. During 1950, in addition to being there, individuals were seen frequently in open fields and along roads, areas where they normally do not fly. Perhaps the pressure of so many individuals forced them out of their usual habitats. In collecting trips near Washington between June 14 and June 20, I noticed no swallowtails at all. Later in the season, swallowtails of the species P. glaucus (both color forms), P. ajax, P. troilus, P. philenor, and P. marcellus were present in usual numbers, as observed at Rock Creek Park, Washington, D.C.; Loudoun Co., Va. (Goose Creek), C and O Canal, Montgomery Co., Md., and other localities."

Smith, collecting around Newman, GEORGIA, has submitted a list noting the succession of appearance of the various species found in the area, including the date when first noted in 1950: Colias eurytheme (Jan.26); Eurema nicippe (Jan.26); Erynnis terentius (Feb.27); Papilio ajax (= polyxenes)(Mar. 11); P. glaucus (Mar.15); Pieris rapae (Mar.15); Papilio marcellus (Mar.17); Vanessa cardui (Mar.17); Phoebis sennae (Mar.17); Polygonia interrogationis (Mar.18); Libytheana bachmanii (Mar.18); Everes comyntas (Mar.24); Erynnis horatius (Mar.24); Junonia coenia (Mar.24); Thorybes bathyllus (Mar.26); Proteides clarus (Mar.26); Papilio philenor (Mar.26); Euptychia gemma (Mar.26); Incisalia irus (Mar.26); Danaus plexippus (Mar.29); Phyciodes tharos (Apr.2); Vanessa atalanta (Apr.2); Catia otho (Apr.2); Papilio troilus (Apr.3); Erynnis martialis (Apr.3); Hesperia metea (Apr.3); Eurema jucunda (Apr.8); Euptychia sosybius (Apr.9); Erynnis juvenalis (Apr.9); Achalarus lycidas and Thorybes pylades (Apr.19); Amblyscirtes vialis (Apr.21); Zerene caesonia (Apr.22); Atrytonopsis hianna (Apr.23); Pholisora catullus (Apr.29); Poanes zabulon (Apr.30); Phyciodes ismeria (Apr.30); Limenitis arthemis astyanax (Apr.30); Copaeodes minima and Incisalia niphon (May 5); Pholisora hayhursti, Lycaenopsis pseudargiolus, and Polites brettus (May 11); Oligoria maculata, Strymon melinus, and Amblyscirtes hegon (May 28); Speyeria cybele (July 2); Eurema lisa (July 23); Minois alope (July 23); Hylephila phylaeus (Oct.20).

FLORIDA. Davidson made the following observations in the vicinity of Orlando. In general, the Hesperiids were less common than in 1949 with the exception of Proteides clarus and Ancyloxypha numitor. Strymon m-album, S. cecrops, and Leptotes theonus were also less common, while Atlides halesus, Hemiargus hanno, and Brephidium pseudofea were more abundant. He also noted that "Whereas D. plexippus was quite scarce and D. berenice common throughout 1949, the reverse condition obtained in 1950. A concentration of about 25 individuals of the former were noted at Titusville on the Indian River Nov.15, in a small area suggesting migration."

Gillham, also collecting in Florida, noted that the weather during the latter part of March was fair and hot. From his list, all of the species typical of the area were in flight, although many of the rarer species were not collected. Two specimens of Asbolis capucinus were collected at Delray Beach, with several more being seen.

Concerning Florida, Shappirio wrote: "According to entomologists in northern Florida, especially in Putnam and Marion Counties, the summer of 1950 was one of the driest in recent years. Despite this, during the few days I was there early in September, I could detect no noticeable reduction in numbers of individuals from what would assumedly be normal numbers."

In ALABAMA, the general climatic conditions were as follows. The winter of 1949-50 was exceptionally mild, with only one cold spell, of short duration, characterized by a light snow, but not by exceptionally low temperatures. The spring was normal, although about two weeks later than usual. The summer was normal, with a slight drought characterizing July and August. Autumn was normal, although the winter was earlier than usual, beginning with an exceptionally cold spell beginning on Nov.25, and persisting throughout December. As predicted on the basis of the mild winter, the boll weevils increased in number and seriously affected the cotton

FIELD SEASON SUMMARY 6. SOUTHEAST - cont.

crop. It was expected that we should also have a fine flight of butterflies. However, 1950 proved to be the poorest year for collecting that I have seen since coming south in 1947.

Of those butterflies which characterize the spring flight, Papilio marcellus, Erynnis juvenalis, and Erynnis brizo were exceptionally rare; Everes comyntas, Phyciodes tharos, Eurema lisa, and E. jucunda had normal flights; and Mitoura damon was more abundant than normal, along with Vanessa cardui, which had an exceptionally good flight. During the summer, all of the common butterflies were relatively scarce with the exception of Euptychia sosybia , E. gemma, Lethe portlandia, Eurema lisa and nicippe. Of particular note was the marked rarity of Euptoieta claudia, Agraulis vanillae, Phoebis eubule, Lethe eurydice, and to a lesser extent, Hylephila phylaeus and Atalopedes campestris, normally two of the commonest species found in the area. The fall flight again varied considerably. Lerema accius was somewhat more abundant than normal, while the Pierids and Satyrids were relatively abundant. Many of the Hesperiidae such as Amblyscirtes textor and Eudamus proteus were very rare. The really cold winter stopped the winter flight, and butterflies were almost completely absent during December.

A few observations on certain species are worth mentioning. Heliconius charithonius was collected for the first time in Alabama, near Fairhope, Baldwin Co., on Nov.22, where it apparently is native. The only previous record from any of the Gulf States, exclusive of Florida and southern Texas, was that of Reizenstein (1863) from New Orleans, which is still unverified. Perhaps this species may occur along the Gulf of Mexico as isolated colonies, and additional collecting may throw some light on the possible origin of the Floridian population.

Lethe portlandia, which occurs as a colony near Tuscaloosa, apparently is triple-brooded in this area,-a spring, summer, and fall brood, with only slight overlapping. Lethe creola, which flies in the same area, apparently is only double-brooded, these broods not coinciding directly with any of those of portlandia.

In a survey of the adults of the Screw Worm (Cochliomyia americana), traps baited with citrated whole blood were set out in Clarke County. A number of butterflies were caught representing the following species: Papilio philenor; P. troilus; Junonia coenia; Limenitis arthemis astyanax; Polygonia interrogationis; Asterocampa celtis; Libytheana bachmanii; and Polites brettus. Also collected in the traps were specimens of Amphion nessus and Hemaris diffinis.

Mather, collecting in MISSISSIPPI near Clinton, made a number of interesting observations. He has collected nine species which were not recorded by Hutchins (Can.Ent., 65: 210-213; 1933) who wrote the only available list of butterflies collected in Mississippi.

Hutchins had listed five species which Mather had not seen until this year: Atlides halesus; Danaus berenice; Ascia monuste; Nymphalis antiopa; and Catia otho. He also noted that the following species, which he had collected in previous years, were not observed during 1950: Papilio palamedes; Nathalis iole; Pieris protodice; Lethe portlandia; Vanessa cardui; Erynnis juvenalis; Polites themistocles; and P. brettus.

A few of his observations of certain species deserve quoting. "Colias philodice: out of a large number of specimens of Colias taken at Clinton since 1946 only one specimen assignable to philodice has been taken. It was a small pale male that was taken with a large number of small pale male eurythemes on 23 January, 1949. The second and last specimen of philodice that I have so far taken in Mississippi was a larger darker male taken at Plymouth Bluff in northeast Mississippi on 13 Oct. 1950, flying with a considerable number of larger darker eurytheme.

"Euptoieta claudia: specimens have been taken at Clinton in every year since 1946 and in every month except January, April, and December. In 1950 it was apparently absent until July.

"Goniurus proteus: seen in 1948 in July and October, taken on 14 July; seen in Sept. 1949, but not taken in that year; seen in Oct. and Nov. 1950, and taken on 1, 3, and 22 Oct., more abundant in 1950 than in any previous year.

"The following species have been observed or taken in all 12 months of the year in Clinton: Colias eurytheme; Phoebis sennae; Pieris rapae; and Junonia coenia."

A number of observations have been made on butterfly migrations in southeastern United States. Fales, in Maryland, made the following notes on Danaus plexippus. "April 26, Collected a female Monarch in orchard at Beltsville, Md. This specimen was surely from last fall and probably migrated from away south." "May 6, O.F. Bodenstein reports one Monarch in flight to north over water at Galesville, Md." "July 25, Few Monarchs seen every day now." "Sept.5, In Northern Maryland saw only about 8 Monarchs which were probably migrating south." "Sept.17, Above Cambridge on Route 50 near Easton, Md., in Talbot County, Monarchs were seen several at a time crossing the highways in S.S.E. direction. This was evidence that a weak migration was probably taking place." " Sept.18, Many Monarchs seen in flight in general southward direction in area between Beltsville and Silver Spring, Md." From Sept. 26 to Nov.8, he saw only occasional specimens of this species.

Smith, at Madras, Georgia, lists the number of specimens of Monarchs that he collected as follows: July 26, 12 specimens; Oct. 14, 19 specimens; Oct. 15, 42 specimens; Oct. 27, 267 specimens.

In Tuscaloosa, Alabama, a fairly normal northward migration in the spring was noted throughout April and early May. A ratio of approximately 60% females and 40% males characterized this flight, indicating that both sexes participate in this northward migration. In the fall, the southern migration was noteworthy because of its absence. Only very few individuals were noted during the period when this flight is expected.

A large migration of Ascia monuste was observed on Dauphin Island and the Fort Morgan Peninsula in Mobile Bay, Alabama, flying eastward. These were

all referable to the Floridian subspecies phileta.

Fales made the following observations on the migration of Phoebis sennae eubule in Maryland: "Sept. 10, At Ocean City, P. eubule was abundant." "Sept. 15, Today I watched a northward migration along the beach at edge of ocean at Ocean City of P. eubule at rate of a minimum of 5 per minute (sometimes 10). The altitude varied from 3'-4' to 20'-25'. There was no ground air movement. Some clouds though were going to the northeast. Temperature was 80° F." Similar observations were made on Sept. 16. However, on Sept. 17, he saw only a few specimens of this species. In Tuscaloosa, the spring flight of P. sennae was normal. The fall migration was not as strong as in previous years.

Although the data were sparse for the area, some of the observations seem to be significant. In general, there was a relatively mild winter, with warm temperatures. However, a slight cool spell did tend to retard the arrival of spring, and the emergence of spring butterflies. In Maryland, all of the species which had normal flights are those which are widespread in distribution, and successful in a number of Life Zones. Papilio marcellus, which is essentially more southern in distribution, had a good flight in the spring which may be logically attributed to the mild winter. Among those species which were rarer than normal, many have very wide ranges of distribution, many tend to be more limited to the temperate areas, while a few such as E. claudia and J. coenia are essentially more southern butterflies which are approaching their northernmost limits in Maryland. One would expect those species with more restricted distributions, such as S. idalia, to be more directly affected by temperature changes than those with wide ranges such as P. tharos; but one would also expect those butterflies more characteristic of the warmer regions to be more successful in a mild winter.

In Alabama, the spring flight was also interesting. Papilio marcellus, endemic to eastern United States, was rare in contrast to the flight in Maryland; Erynnis juvenalis and E. brizo, essentially temperature forms, were also rare. The winter might have been too warm for their survival. Eurema lisa and E. jucunda, essentially more southern species, and E. comyntas and P. tharos, which had wide distributions, were able to survive the winter strongly. The summer flight was particularly significant, because many of the common species characteristic of the South, were marked by their rarity, such as A. vanillae, E. claudia, and H. phylaeus. With a mild winter, and an average summer, one would expect a normal or good flight. These data suggest that the relative abundance of these butterflies is not directly correlated with winter temperatures. The ability of many of the species to survive must be related to other environmental factors, or combinations of factors, necessitating more extensive observations on the environment.

Contributors: T.B. Blevins; W.M. Davidson; J.H.Fales; N.W. Gillham; B. Mather; D.G. Shappirio; M.E. Smith.

7. NORTHEAST - DELAWARE AND PENNSYLVANIA NORTH TO SOUTHERN QUEBEC

by Eugene G. Munroe
Ottawa, Ontario

Conditions were somewhat varied in the Northeastern Area in 1950. In southern Quebec and Ontario the early part of the winter was exceptionally mild; this was followed by bitter cold and heavy snowfall in February and March. The spring was only a little delayed and was normally warm. On most of the Atlantic Seaboard, on the other hand, the winter was mild, the snowfall light, and the first warm weather early. The early warm period was, however, soon succeeded by a cool, wet interval, which had the effect of delaying the emergence of many spring species.

In general, the abundance of Lepidoptera seems to have been at a normal or higher than normal level in most regions. Low numbers were reported chiefly from those areas in which large-scale DDT spraying was also reported. Migrants appear to have been scarce. Danaus plexippus appeared in much smaller numbers than in 1949, although the date of arrival in the Montreal region was again early. Vanessa cardui was scarce or absent everywhere. Several species did appear in abnormal abundance, the most conspicuous being Malacosoma disstria, which occurred in very large numbers over a considerable area in southern Canada. On the Atlantic coast, Datana spp. seem to have been unusually abundant: in Connecticut, defoliation was caused by D. drexelii on Vaccinium and Hamamelis and by D. integerrima on Juglans nigra; in New Jersey, Datana sp. defoliated several square miles of scrub oak in the Pine Plains. An outbreak of Alypia octomaculata on the Yale University campus caused defoliation of thousands of square feet of ornamental vines. The detailed summary by regions follows.

PENNSYLVANIA: northeastern Lancaster Co. (Ehle). Butterflies were about normally abundant, their numbers showing some decrease from 1949. Junonia coenia and the three species of Vanessa were very markedly reduced. Euphydryas phaeton and Boloria toddi were unusually common, Euptoieta claudia unusually scarce. Strymon melinus was scarce, S. falacer scarcer than in the past few years, and many individuals dwarfed; S. edwardsii was abundant in clearings in oak scrub; 180 specimens were taken in 2 days; many were unusually fearless or lethargic, and could be picked up with forceps, and even induced to remain on the shoulder or hand of a moving person. One female of S. liparops was taken among the ed-

FIELD SEASON SUMMARY 7. NORTHEAST - cont.

wardsii. Danaus plexippus was present in normal numbers, but no migratory activity was observed. Dates of emergence were normal or a little late. Polygonia comma appeared in numbers on Apr.3, Incisalia augustus on May 7, Mitoura damon on May 27, Papilio glaucus, 1st gen. May 6, 2nd gen. June 18, 3rd gen. Aug.14, Megisto eurytus June 8, Speyeria cybele July 8, Polites cernes Aug.19, Lerodea l'herminier Sept.3.

NEW JERSEY: Pine barrens near Pemberton (Cadbury). Early spring species appeared in normal numbers, but moths later seemed below normal, at least as represented at light. Paonias astylus was scarce, 2 specimens being taken as against 20 in 1948. Heavy DDT dusting from aircraft has been carried on in blueberry fields in 1949 and 1950.

Lakehurst (Ehrlich and Hessel). Mitoura hesseli attracted as many as nine collectors to this locality in a single day, on which between 70 and 100 specimens were taken [one hopes that restraint will be exercised, at least until the range and distribution of the species are better known]. On May 6 Incisalia polios and augustus were in fresh condition, also Erynnis brizo and juvenalis; this is considered to be about 3 weeks late for the locality. On May 13 M. hesseli was at its maximum, nearly 2 weeks later than in 1949. On July 29, 1 Atrytone bimacula was taken in poor weather; on Aug.9 Atrytone dion was common, also Minois alope, Everes comyntas, Atrytone ruricola, and other species. Despite search by a small army of collectors from July 20 to Aug.11 no second flight of M. hesseli was detected, although a full-grown larva was taken on Aug.9.

Other localities (Ehrlich). At Lebanon State Forest, Lycaena epixanthe was enormously abundant on July 1; two collectors took over 500 specimens in an hour; fresh Atrytone bimacula were also frequent; other species were Euptychia areolatus and Strymon falacer. At Springdale on July 7 Calephelis borealis was beginning to appear, Megisto eurytus, and Proteides clarus were common, Strymon falacer was taken; on July 19 C. borealis was frequent and in fresh condition. At Newfoundland, Melitaea harrisii was in good condition on June 22 (unusually late); Euphydryas phaeton was common on that date and persisted until July 19, a very late date. Also at Newfoundland on June 22 were Hesperia sassacus in large, and Poanes hobomok in very large, numbers. On July 19 Strymon titus was emerging, Speyeria cybele, Lycaena phlaeas and Minois alope were common.

Shappirio wrote: "On June 13, 1950, I drove from Akron, Ohio, to Washington, D.C., through East Liverpool, Ohio, Pittsburgh, the Pa. turnpike to Breezewood, Pa., Hancock, Md., and then to Washington. All the way from Akron, Ohio, to the eastern slope of the Appalachian mountains, when it became too late in the day, I saw many dwarf male P. glaucus. The specimens were all fresh, and appeared to be recently emerged. (In Washington, specimens were taken in late May; see other notes.) In general, P. glaucus was more noticeable than usual; between Akron and a point on the Turnpike I counted 35. In a trip to Adams Co., Pa., on June 18, I saw none. It is difficult to explain why none were seen, since Adams Co. is on the eastern slope of the mountains, in an area not far distant from where many were seen only five days before."

NEW YORK: Long Island (Hessel). Most Lepidoptera were below normal numbers, possibly as a result of building projects and of spraying with DDT. Incisalia were more common than usual, especially I. niphon; the first appearance of this species was on May 17, as compared with April 11 in 1949. Vanessa cardui and Phoebis sennae were not seen; Danaus plexippus was perhaps not up to normal numbers; Alabama argillacea was scarce. Saturniids and Catocala were much below normal numbers. Unusual captures were 4 Atreides plebeja, 1 Herse cingulata, 2 Psectraglaea carneosa, 1 Xylotype capax. A good flight of Hemileuca maia occurred on eastern Long Island, where the species had not been seen for several years.

Ithaca (Keji). Dates should be compared with those given in the 1949 summary. The number of different days on which each species was seen is indicated, as well as the range of dates. Papilio aiax, May 24 to Oct.2, 62 days; P. glaucus, June 9 to Aug. 5, 20 days; P. troilus, July 31 to Aug.11, 4 days; Pieris rapae, May 2 to Nov.1, 152 days; Colias eurytheme, June 24 to Nov.7, 73 days; C. philodice, May 24 to Nov.1, 58 days (both Colias were less common than in 1949); Danaus plexippus, June 6 to Oct.30, 68 days (definite indications of southward migration in September and October, with a peak of abundance in the latter part of each of those months); Lethe portlandia not seen; Minois alope, July 9 to Aug.26; Megisto eurytus, June 8 to 26; Speyeria cybele, June 30 to Sept.9, 30 days; Boloria toddi, May 27 to Sept. 14, 10 days; Euphydryas phaeton, June 23; Phyciodes tharos, May 25 to Oct.21, 68 days; Polygonia interrogationis, June 26 to Sept.2, 5 days; Nymphalis antiopa, April 26 to Oct.21, 5 days; Vanessa atalanta, May 5 to Sept.7, 10 days; V. cardui, not seen; Limenitis arthemis, June 13 to Aug.22, 4 days; L. archippus, Aug.7 to Sept.18, 6 days; Lycaena thoe, June 6 to Sept.30, 9 days (scarcer than in 1949); L. hypophlaeas, July 12 to Oct.7, 32 days; Everes comyntas, June 10 to Oct.19, 40 days; Lycaenopsis pseudargiolus, May 22 to Aug.27, 5 days; Proteides clarus, July 26 to Oct.3, 4 days; Pyrgus communis, June 5 to Sept.7, 17 days; Pholisora catullus, May 27 to Aug. 28, 30 days; Thorybes pylades, June 12 to Aug.13, 9 days; Ancyloxypha numitor, June 13 to Sept.7. In general, emergences were considerably later than in 1949.

Sardinia (Rupert). Late summer and all autumn collecting was disappointing; many normally common species of Heterocera were scarce. The autumn migrants, such as Alabama argillacea and Anticarsia gemmatilis, were not seen. Kimball records for the first time from the State: Lycaena dorcas michiganensis, from Fishers, Ontario Co.; and Xylormisa louisiana, from Penfield, Monroe Co.

CONNECTICUT: New Haven region (Remington, Remington, Pease, Bellinger). After a mild winter, the spring was late, cold, and wet. In June the weather improved and the remainder of the season was normal. The early Geometridae appeared by Apr.4; spring but-

terfly dates follow: Lycaenopsis pseudargiolus Apr. 19 to May 4; Erynnis brizo, May 6 to 13; E. juvenalis, May 13 to June 4; Anthocharis midea, May 3 to 13; Strymon melinus, May 6; Lycaena phlaeas, May 27 to June 23; Boloria toddi, May 27 to June 22. These are all 1 to 4 weeks later than corresponding dates for 1949. Mitoura damon and Anthocharis midea were much less common than in 1949. Summer butterflies were for the most part at least as common as in 1949; exceptions were: Melitaea harrisii, Asterocampa celtis, Limenitis astyanax, which were much scarcer; and Euphydryas phaeton, Phyciodes nycteis, Achalarus lycidas, which were somewhat scarcer, than in 1949. Summer dates follow: Papilio glaucus, June 2 to Sept.17; P. troilus, June 2 to Sept.8; Eurema lisa, July 13 to Aug.11, Aug.27 to Sept.6; Euphydryas phaeton, June 22 to July 8; Melitaea harrisii, June 22 to July 13; Speyeria idalia, July 5 to Sept.8; S. cybele, July 5 to Sept.8; Phyciodes tharos, June 2 to July 5, July 19 to Sept.23, Oct.14 (f. marcia); Lethe eurydice, July 5 to Aug.9; Megisto eurytus, June 11 to 28, July 13 to Aug.5; Strymon falacer, June 28 to July 9; Lycaena thoe, June 11 to 22; Atrytone conspicua, July 12 to Aug.5; Poanes hobomok, June 16 to July 8; Pholisora catullus, June 4 to July 5, July 29 to Aug.23; Ancyloxypha numitor, June 18 to July 23, July 31 to Sept.8. Danaus plexippus was first seen on June 4; there was no conspicuous migration. Vanessa cardui was not seen. More numerous than usual were: Poanes zabulon, June 20-22 and Aug.25-28; P. massasoit, July 19 to Aug.5; Atrytone logan, July 14 to Aug.10; Strymon liparops, July 12 to Aug.8; S. acadica, July 19 to 25; Lerodea l'herminier, June 28, Aug.28 to Sept.2. Unusual records were: Hesperia metea, June 2; Junonia coenia, Aug.2 to 8; Papilio cresphontes, Sept.2, also many larvae (date not specified); Pyrgus communis, Oct.8. Utetheisa bella larvae were common on Crotalaria, but adults were rather scarce; Thyridopteryx ephemeraeformis was common for the first time in history. Lycomorpha pholus was numerous in late June; Cisseps fulvicollis and Ctenucha virginica were very abundant, Catocala badia and epione were common; larvae of Lagoa crispata and Sibine stimulea were numerous; Antheraea polyphemus larvae and Samia walkeri cocoons were numerous; Oreta rosea larvae were much scarcer than in 1949.

MASSACHUSETTS: Barnstable (Kimball). In April there was a heavy flight of Agrotis ypsilon, otherwise little activity; later in the season this species was scarce. In July, collecting at light was excellent; in September and October it was unproductive. Response to bait was poor throughout the season. Species less common in 1950 than in 1949 were: Crambidia pallida; Anomogyna elimata (although A. dilucida was common); Schinia arcigera; S. brevis; Doryodes spadaria (2 specimens, as against many in 1949); Gabara bipuncta; Metasiopsis ossularia; and most Crambinae and Phycitinae; Crambus decorellus and Argyria argentana were, however, more common than in 1949. Other species more common than in 1949 were: Lycaena phlaeas; Acronicta spp.; Graphiphora badinodis; Leucania insueta; Oncocnemis riparia; Chamyris cerintha; many Notodontidae; Habrosyne scripta; Paraphia esther; Syssaura puber. The following were not common, but appeared in moderate numbers: Pholus achemon; Ecpantheria deflorata; Paectes pygmaea; Itame latiferrugata. Euclea delphinii was less common than in 1949, and its range of variation was restricted, all specimens belonging to f. viridiclava. Migrants were scarce; only one each of Celerio lineata and Alabama argillacea were taken, and Anticarsia gemmatilis was not seen. Interesting captures were: Ampeloeca versicolor; Citheronia sepulchralis; Papaipema stenoscelis; Atethmia rectifascia; Rhodoecia aurantiago; Eublemma minima; Oruza albocostaliata; Eutelia pulcherrima; Acentropus niveus. New records for the region are: Hydroecia micacea; Cataclysta slossonalis.

NEW HAMPSHIRE (Remington, Remington, Pease, Lennox). Oeneis semidea, Limenitis arthemis, Speyeria atlantis, were all common in the White Mts. in July, and some Byrdia rossi were found. The flight of Boloria montina in August was heavy.

MAINE (Brower, Grey, Blevins). After a mild winter with light snow, warm weather began in April, but was followed by an extended period of cool, cloudy weather. In southern Maine the second half of the season was very dry. Butterflies were scarce except for northern and bog-inhabiting forms, which seemed to prosper; Lycaenidae were perhaps more abundant than usual. Some notes on species follow. Papilio ajax, Augusta, May 21 into June; P. glaucus, Oakland, May 22 into June; Colias eurytheme was almost lacking, but one specimen was identified at Augusta, Oct.20; C. philodice appeared at Eastbrook, May 22, and small numbers followed; C. interior, Mt. Katahdin, July 9; Pieris napi in northwestern Maine, June 9; fresh-looking Danaus plexippus appeared June 6 at Belgrade, was later more numerous than usual in the Augusta region; Megisto eurytus, Belgrade, June 19-20; Oeneis jutta, Passadumkeag, May 30; O. katahdin in average numbers, July 9-10; Speyeria cybele appeared at Augusta, July 3; S. atlantis and aphrodite were scarce; Boloria selene was scarce, appeared at Lincoln, May 29; B. toddi appeared at Oakland, May 22; Phyciodes tharos was scarce, appeared at Eustis, June 9; Polygonia faunus and progne were very numerous near the Quebec border, June 9; Vanessa atalanta was not seen; V. cardui was scarce; Limenitis archippus, Norridgewock, June 10, later scarce; Strymon melinus, Lincoln, May 29, more common than usual at Augusta; Incisalia augustinus, Franklin, May 23, Lincoln, May 27-30, Bar Harbor, June 2; I. polios, Franklin, May 23, Lincoln, May 27; I. niphon, Lincoln, May 27, Belgrade, June 5; I. henrici, Lincoln, May 29; I. lanoraieensis, Lincoln, May 28-30, numerous; Lycaena phlaeas, Bar Harbor, June 2, in reduced numbers throughout the season; Thorybes pylades, Augusta, June 16-17; Erynnis icelus, Franklin, May 23, Eustis, June 9; Ancyloxypha numitor, crest of Mt. Katahdin (!), July 9, Augusta, Aug.15; Hesperia sassacus, Belgrade, June 20; Poanes hobomok, Ellsworth, June 3; Amblyscirtes vialis, Bar Harbor, June 2. Dr. Brower submitted numerous moth records, of which a few are given. Lapara bombycoides, Princeton, July 1-21; Actias luna, more common than usual; Halisidota maculata, Princeton, June 16-July 7; Spaelotis clandestina, Augusta, June 21; Orthosia revicta, Blue Hill, May 22; Hydroecia micacea, Augusta, bred from rhubarb, Aug.8; Liparis dispar, first at

FIELD SEASON SUMMARY 7. NORTHEAST - cont.

Augusta July 29; Malacosoma americana, first at Augusta, July 1; Mesothea incertata, East Orland, May 22, Franklin, May 23; Heliomata cycladata, Smithfield, June 25; Dysmigia loricaria, Kingfield, June 10; Cingilia catenaria, Charlotte, Sept.22, Augusta Oct.3; Metrea ostreonalis, Millinocket, June 29; Sthenopis argentecomaculatus, Brownfield Junction, July 8, Fort Kent, July 16; Hepialus gracilis, Millinocket, Aug.2. Mr. Grey notes that Notodontids were unusually abundant, and that two Sphinx canadensis were taken at Lincoln, the first in several years. A flight of Alabama argillacea was observed at Augusta, Sept.7.

NOVA SCOTIA (McDunnough and Ferguson). The season was an average one for Lepidoptera; butterflies were common in the intervals of damp weather. The first butterflies appeared, as usual, about May 5, and some butterflies persisted until Nov.1. Vanessa cardui, V. virginiensis, and Colias eurytheme were not observed; Danaus plexippus was scarce. Polygonia and Nymphalis remained scarce. The three spp. of Speyeria were numerous from Baddeck southward; Glaucopsyche lygdamus was taken, for the first time on the N.S. mainland, at Halifax. Erynnis juvenalis occurred in numbers at L. Kejimukujik, Queens Co., in late May. Many interesting moths were taken. The following are new records for N.S.: Anomogyna imperita, Mt. Uniacke, Aug.11-18; Epiglaea epiata, various bogs, Sept., Oct.; Phuphena u-album, L. Kejimukujik, May 29; Anacamptodes humaria, Mt. Uniacke, June 7-15. The following species were taken in numbers for the first time: Anomogyna perquiritata, Graphiphora opacifrons, Apharetra dentata, Hillia iris, Harpaglaea sericea, Xanthia lutea, Anathix puta, Oligia minuscula, Eremobina claudens, Nycteola frigidana, Epizeuxis laurenti, Plemyria georgii, Thera juniperata, Eupithecia nimbicolor, E. interruptofasciata. Interesting Microlepidoptera were Olethreutes fulvifrontana and Tortrix alberta.

NEW BRUNSWICK (Rupert and Ferguson). Collecting in northern and eastern N.B. in the period July 8-17 was extremely productive. Butterflies were moderately, moths very plentiful; 211 species were taken. The colony of Papilio brevicauda near Tabusintac was still flourishing. Colias interior was common on heaths and bogs everywhere; several Phyciodes nycteis were taken near Allardville; Plebeius aster was numerous at Grande Anse; P. saepiolus was common on the Tantramar Marshes and near Bathurst. The following are interesting moth records: Apantesis williamsii, Caraquet; Parasemia parthenos, general; Harrisimemna trisignata, Caraquet, Dorchester; Anaplectoides pressus, general; Enargia mephisto, Bathurst; Mycterophora inexplicata, Jacquet River; Scopula frigidaria, Allardville and Jacquet River; Semiothisa perplexa, Dorchester, Caraquet, progeny reared on larch; S. orillata; Dysmigia loricaria, very abundant. Notodontidae were very numerous at a locality near Bathurst; 16 spp. were taken.

QUEBEC: Gaspe Peninsula (Rupert and Ferguson). The account of this expedition is being written up up separately and will appear at a later date.

Forestville, Saguenay Co. (de Ruette and McGillis). Two periods of collecting, in the second week of July and the first week of August, were both very productive of moths, although the second was somewhat marred by cold weather. Among the many spp. taken were: Hemaris diffinis, July 8; Euxoa ochrogaster, numerous, Aug.12-13; Crymodes devastator, Aug.12; Anomogyna dilucida, common; Catocala sordida, ultronia, and blandula, all in small numbers in August (Catocala spp. were much less numerous than in 1948); Malacosoma disstria, July 12; Habrosyne scripta, July 7-12; Oreta rosea f. irrorata, July 13; Calocalpe undulata, July 10-11; Hesperumia sulphuraria; Semiothisa granitata, very numerous, July 8-30. Among unusual records were: Diarsia pseudorosaria freemani, July 12, 1 specimen, the first record from south of Hopedale; Euxoa quebecensis, July 12; Anomogyna imperita, Aug.13; Malacosoma pluviale, Aug.8.

Ste. Anne de Bellevue and vicinity (Gray, Freeman, Hardwick, Munroe, McGillis). Butterflies were in general scarcer than usual. Some records of Lepidoptera follow. Nymphalis j-album, May 5; Caenurgina spp., May 13; Pieris rapae, May 14; Phigalia titea, May 15; Pieris rapae, numerous May 22; Lycaenopsis pseudargiolus and Apaecasia defluata, May 22; Papilio ajax, May 24; Papilio glaucus, May 27; Colias philodice, white female May 29, males May 31; Alypia octomaculata, June 4; Boloria selene, June 4; Phyciodes tharos, June 10; Limenitis archippus, June 18; Poanes hobomok, June 18; Limenitis arthemis, Isia isabella, Ctenucha virginica, all June 22; Spaelotis clandestina, June 23; Ancyloxypha numitor, July 2 (a month earlier than in 1949); Scoliopteryx libatrix, in house July 8; Eulype shastata, Proteides clarus, July 8; Nymphalis antiopa, July 9; Strymon titus, July 10, 19, 20; S. acadica and falacer, July 20; Atrytone ruricola, Speyeria cybele, July 20; Phragmatobia fuliginosa, July 23; Catocala ultronia, July 28; Horisme intestinata, Aug.4; Ancyloxypha numitor, Aug.15; Pyrausta inaequalis, Aug.27; Stamnodes gibbocostata, Aug.30; Lithophane bethunei and Nephelodes emmedonia, Sept.1; Catocala concumbens, Sept.2; Phyciodes tharos, Oct.7; Danaus plexippus, Oct.8; Erannis tiliaria, Oct.18; Colias philodice, Oct.29; Pieris rapae, Nov.3. D. plexippus was scarce; V. cardui and virginiensis were not seen; Polygonia was scarce; Strymon spp. unusually common; an unusual record was Strymon melinus. Pieris virginiensis was taken in small numbers on Ile Perrot in May.

Kirks Ferry, Gatineau District (Beirne). A light trap was operated on a wooded hillside at this locality in May, early June, August, and September. Results were in general good. Some specific records follow: Lycia ursaria, Phigalia titea, Bapta glomeraria, Nyctobia limitaria, all common, May 15-20; Cladara atroliturata, Abbotana clemataria, Aethalura anticaria, May 22; Metarranthis duaria, Anisota rubicunda, May 24; Feralia comstocki in moderate nos. and Xylomiges dolosa very common in May; Habrosyne scripta, Aug.7-10; Calocalpe undulata, Aug.8-9; Carpeta angustiorata, Aug.9; Tolype laricis, Aug.6 to Sept.7; T. velleda, Sept.3; Campaea perlata, Aug.21;

Itame ribearia, Aug.28; Amphidasis cognataria, Aug. 15-26; Crambus latiradiellus, Aug.21-26; Thaumatopsis gibsonellus, abundant in early September.

Special records: An enormous outbreak of Malacosoma disstria larvae occurred in the region of Meach Lake, near Ottawa, in June; Oeneis chryxus strigulosa was taken in numbers near Beechgrove, northwest of Ottawa, constituting a new record for the Province.

Contributors (only those who reported are listed; those whose collecting was reported by others will be found listed under the appropriate regions,above): P.F. Bellinger; A.E. Brower; J.W. Cadbury, 3rd; G. Ehle; P.R. Ehrlich; D.C. Ferguson; N.W. Gillham; P.H.H. Gray; L.P. Grey; D.F. Hardwick; S.A. Hessel; J.A. Keji; C.P. Kimball; D.J. Lennox; R.W. Pease, Jr.; C.L. Remington; J.E. Remington; L.R. Rupert; D.G. Shappirio.

8. FAR NORTH - ALASKA TO LABRADOR

by T.N. Freeman
Ottawa, Ontario

The only source of information this year was the collections of the Northern Insect Survey expeditions. The localities are situated within the coniferous forest and on the barrens of the area between the Mackenzie River and Hudson Bay. Lepidoptera were more numerous at Ft.Smith and Ft.Simpson, N.W.T., than at any other locality that was investigated. This abundance is understandable because those localities are situated well within the rich fauna of the northern boreal forest. Lepidoptera were least abundant at Cambridge Bay, Victoria Island, N.W.T. The scarcity at this latter locality is probably perennial because it is situated in the coldest isothermic band. It is significant that Vanessa cardui, which was very abundant in the north last year, was not seen this year. Following are some notes of the dominant species at each of the places that were investigated.

FORT SIMPSON, N.W.T. This locality is situated near latitude 60° at the junction of the Liard and Mackenzie Rivers. The lepidopterous fauna is southern and no arctic intrusions were collected. Collecting started in early June and most of the species had emerged by early July. Nymphalids were the dominant butterflies and Nymphalis antiopa was extremely abundant. N. j-album and N. milberti were also dominant species. Limenitis arthemis, L. archippus, Papilio glaucus canadensis, Speyeria atlantis, Coenonympha ochracea mackenziei, Lycaena thoe, Everes amyntula, and Boloria selene are a few of the many species which occur at Ft.Simpson and are typical of more southern latitudes. The geometrid Campaea perlata predominated among the larger moths although Crymodes devastator, Catocala briseis, and C. unijuga were very abundant.

FORT SMITH, N.W.T. Situated on the Slave River at the boundary between Alta. and the N.W.T. Collecting started about June 1st and by early July most of the spp. had emerged. The fauna is similar to that of Ft. Simpson. Speyeria atlantis predominated in the collections. Colias christina and C. gigantea were abundant. Most of the species taken at Ft. Simpson were also captured at Ft. Smith with the following significant additions: Anthocharis ausonides, Erebia discoidalis, Boloria freija, Phyciodes tharos, Pieris napi, Plebeius scudderi, P. saepiolus, and Papilio machaon ssp.

GILLAM, MANITOBA. Situated about 180 miles south of Churchill, in northern Manitoba. The area lies in the Northern Transition zone and contains, mainly, those species indigenous to the boreal forest with very few transition zone representatives. The Lepidoptera were not well represented this year either in number of species or number of individuals. Temperatures of 80° F. as well as snow storms occurred in late May and as a result, butterflies did not emerge to any extent before June 1st and emergence continued into July. A few specimens of each of the following were taken but the numbers were not significant to establish dominant forms: Colias pelidne, Speyeria atlantis, Phyciodes tharos, Plebeius scudderi, Boloria frigga, B. freija, B. selene, Anthocharis ausonides (a significant record), Lycaenopsis pseudargiolus, and Incisalia augustus.

ESKIMO POINT, N.W.T. Situated about 175 miles north of Churchill on the west coast of Hudson Bay. The fauna of this tundra locality is essentially arctic with very few accidental intrusions from the boreal forest. Lepidoptera began to emerge in early July and continued to emerge into August. Colias predominated among the genera with nastes, hecla and pelidne the abundant species. Nymphalis antiopa and Archips conflictana represent significant intrusions from the south. Oeneis were rare as was Boloria freija. Erebia rossi ssp., Boloria improba, B. aphirape triclaris, B. polaris and B. chariclea were numerous, triclaris predominate in the genus.

PADLEI, N.W.T. Situated about 150 miles inland from Eskimo Point and containing, for the most part, the same species as those at Eskimo Point. Lepidoptera began emerging in early July. Our little friend Archips conflictana represented an intrusion as at Eskimo Point and apparently is inclined to enjoy cold feet. Erebia rossii and E. fasciata predominated in the collections. Oeneis taygete hanburyi, Colias pelidne, nastes and hecla were abundant. Boloria aphirape triclaris again predominated in this genus; improba, chariclea, polaris and freija were rare.

CHESTERFIELD INLET, N.W.T. Located on the northwest coast of Hudson Bay. The fauna is entirely arctic and the first Lepidoptera emerged in mid-July. Colias was the predominant genus and nastes and hecla

FIELD SEASON SUMMARY 8. FAR NORTH - concl.

were abundant. Boloria, Erebia, and Oeneis were well represented by the usual eastern arctic species. B. aphirape triclaris was not taken. Erebia fasciata was not as abundant as at Padlei.

REPULSE BAY, N.W.T. At the base of the Melville Peninsula and east of the Fox Basin. The ice left the bay on August 4 - the latest in 17 years, according to P.F. Bruggemann, who investigated the area. The fauna is all arctic and collecting starts in early July. Colias hecla and nastes predominated. Boloria improba and polaris were abundant. Erebia rossii was found, but not fasciata. Lycaena phlaeas and Plebeius aquilo were taken. Anarta richardsoni and two pterophorids were prevalent moths.

CAMBRIDGE BAY, N.W.T. On the southern coast of Victoria Island near longitude 105°, just north of the continental land mass. Ice was present in the bay throughout the summer months. The fauna is entirely arctic. Lepidoptera first appeared on July 11. C. nastes and hecla predominated. Boloria was represented by a few specimens of titania ssp. and polaris. A few specimens of P. aquilo, Oeneis melissa assimilis and Erebia rossii were obtained. Lepidoptera were scarce at Cambridge in 1950.

BOOK REVIEWS 18. A Field Guide to the Butterflies of North America, East of the Great Plains, by Alexander B. Klots*

Here is the most important publication on North American butterflies to appear since at least 1931. Most readers of this review will own the volume soon and quickly become familiar with its manner of treatment. Nevertheless, there are so many remarkably good features of the book that it is a pleasure and a duty to point them out in some detail. There are also matters which are either errors or omissions. Then, too, there are points of interpretation to be considered, an aspect which, like most reviewers, I cannot resist developing.

This ideal little book is the newest (and biologically finest) member of the highly successful Field Guide Series, edited by the pioneer in the series, Roger Tory Peterson. The present volume has an amount of valuable detail which seems quite impossible for a book this size. In fact, not since the superb volumes by Scudder has one work presented so much information on the butterflies.

Nearly one-third of the Field Guide is devoted to general instructions and discussions. The first chapter, "How to Use This Book", appears to be directed primarily toward "Teachers and Nature Leaders". It is of questionable value in this book, and the precious space might have been devoted to a few subjects unaccountably missing. However, having thus done his "duty", the author immediately turns to a series of lucid, instructive chapters worth reading for any collector. Their subjects are:

The Butterfly and Its Environment
Life Histories and Growth
The Adult Butterfly
Butterfly Classification.

There are three general Appendices at the end of the volume which will also be useful reference sources:

Some Principles of Classification
Butterfly Literature and Collections
Checklist of Butterflies and Skippers.

The body of the Guide contains the account of all the species of butterflies known to live east of the Great Plains. The many spill-overs from the tropics, found in Florida and Texas, are dealt with very fully. There is a key to the eleven families of butterflies in the East, and each family and subfamily is clearly and tersely characterized in its appropriate place in the text. For nearly every species Dr. Klots has given the preferred habitat, a brief description stressing the identification points, a scanty larval characterization, known foodplants, the number of broods and "spring" flight period, hibernation stage, and distribution. The (geographic) subspecies of the East are listed, with their type localities, ranges, and recognition points. A list of "Casual and Stray Species and False or Dubious Records" is appended with comments.

For some of the most confusing groups there are keys to the species (Riodinidae, Theclinae, Incisalia, Plebeiinae, Erynnis, and other Hesperiidae).

The indices make it easy to turn quickly to the page one is seeking. There is an Index to Technical Terms and General Subjects, an Index to Larval Food Plants (including common names), and an Index to Butterflies (also including common names).

"Every species of importance has been illustrated. Color has been used where it is most important for identification. Usually only the upper- or underside has been shown, whichever shows the better identification characters. In general, species which merely stray into our area have not been illustrated, unless they occur widely enough to cause confusion in identifying native forms." (p.xvi)

Some of the colored plates are exceptionally fine (e.g., pl.8). Dr. Klots struggled a long time steadily improving the quality of printing, but some of the colored plates are poor (e.g., pl.16, fig.14 - Erora laeta; pl.21, fig.15 - Eurema daira iucunda; pl.22, figs.7-10 - Colias spp.; and many Hesperiidae). The plate of larvae is even clearer than Scudder's originals from which it was copied. Some of the black-and-white half-tones are not good (e.g., pl.10, fig.7; pl.18, fig.11), but many are excellent.

*349 pp., 40 pls. Houghton Mifflin Co. Boston. 1951. $3.75.

The most obvious criticisms concern names and in some cases are, of course, matters of opinion. The latin names are unhappily subservient to a curious assemblage of "common" names. It is unfortunate that a book which will have such a profound influence on popular lepidopterology does not step out boldly in guiding amateurs to use latin names rather than follow the trail of ornithologists and British lepidopterists. The reader is encouraged to eschew the neat name Boloria improba and embrace "Dingy Arctic Fritillary" (it is improba ble that any common name user will ever see this species alive). There are scores of scarce species with such "common" names. W.J. Holland, in his books, at least placed the common names parenthetically and inconspicuously. Dr. Klots has coined many "common" names, some in place of well-known and characteristic ones, and many previously used but unrepresentative names are perpetuated. We find Agraulis vanillae still the "Gulf Fritillary" (although it abounds in Missouri, California, etc.), Strymon o. ontario now the "Northern Hairstreak" (its headquarters seem to be the Missouri Ozarks), Erora laeta the "Early Hairstreak" (several fly earlier; this fabulous species deserves a better name), Incisalia augustinus the "Brown Elfin" (this is THE reddish Incisalia; all the others are browner), Lycaeides melissa samuelis the "Karner Blue" (Karner is not even the name of the type locality any longer).

Among the latin names it is a pleasure to have this up-to-date treatment. And yet such a "popular" book, which should perhaps be conservative in names, will mislead inexperienced readers by giving so many untested names. There must be serious doubt that pseudargiolus is a subspecies of the European argiolus, that Tritanassa texana should be regarded as a member of Phyciodes, that Atrytonopsis turneri is a good species. The basis for accepting recent name-changes is not consistent. On one hand extreme "splitting" appears in recognizing Libytheana and Speyeria as full genera (and Semnopsyche as anything at all). In contrast, a "lumper" tendency prevails (in much of which I concur), with Basilarchia a synonym of Limenitis, Battus and Graphium as subgenera of Papilio, Eresia and Tritanassa as subgenera of Phyciodes, Satyrodes and Enodia under Lethe. Consistency appears to require that Speyeria and Enodia get the same treatment; either both are genera or both are subgenera. It is regretted that so many worthless subspecific names have been dignified by recognition. Dr. Klots wrote (p.63): "Considerable liberality has been shown in recognizing the worth of many named subspecies, even though some are no more than distinct 'local forms'." Actually, many are not even DISTINCT local forms and should not be passed in review before the neophyte until systematic revisions have shown them worth retention.

One completely mystifying point is the manner of singling out occasional genera in huge type, with no indication of the reason and no separation of species in genera which immediately follow the heralded genera. For example, from type-size one might think that Nathalis, Appias, Pieris, and Ascia somehow fall under EUREMA and that Euphydryas falls with BOLORIA but not with MELITAEA.

There are doubtless many small errors which will be culled out during the revisions of the book. Dr. Klots, expecting this, wrote (p.63): "I hope that omissions will be called to my attention." A few occurred to me in hastily thumbing through the pages. Euphydryas phaeton is represented (pp.34, 93) with only Chelone glabra as its normal foodplant; in Missouri and southern Connecticut I have found it almost restricted to Aureolaria, even in the presence of C. glabra (Conn.), and O'Byrne has published at some length on Aureolaria as a foodplant. Boloria toddi is said to have "two broods" (p.93), although in Connecticut there are surely three and in the South perhaps more. Cornus florida is listed first among foodplants of Lycaenopsis pseudargiolus, and yet I have on numerous occasions tried to get New Haven females to lay on C. florida buds with almost no success and the few larvae quickly died, although the same females readily laid many eggs on buds of the main spring food, Viburnum acerifolium. The realization to which one is forced in perusing Dr. Klots' thorough compilation of life-histories and foodplants is that we know remarkably little about the eastern North American butterflies. Most published larval descriptions have contained so few comparisons that it would be impossible to gather them together as keys or in any other form assuring correct identification of unknown larvae. Pupae and eggs are even less well known! The foodplant lists doubtless contain many impossible foods.

The most surprising major omission is the failure even to mention the developing field of butterfly genetics. Work in genetics of substantial scientific value is within the scope of most amateur lepidopterists with a flair for successful mass-rearing. Such potential workers deserve a simple explanation of at least simple recessives and dominants and sex-limited genes. E.B. Ford's masterful treatment of butterfly genetics in his Butterflies (see Lep. News, vol.1: p.3) is an example of a simple exposition of genetics. Even many years ago W.T.M. Forbes discussed briefly some possibly genetic forms among American Lepidoptera in his Lepidoptera of New York and Neighboring States, Part I (see Lep. News, vol.1: p.63).

Several features in this book are especially valuable. Guide marks are on the plates, pointing out critical characters, and localities are given for the specimens figured, along with the best recognition points, and the range. The keys to the most difficult species and genera will provide identification for many puzzling specimens. Also helpful are the brief notes on "Similar Species", with means of separating them from the species under discussion.

It is a delight to encounter digressions at many points in the compact prose: the tale of Zizula gaika and its introduction (p.163); Lycaenopsis pseudargiolus as a symbol of spring (p.169); the nomenclature of Danaus plexippus (p.78); the range of Erebia disa mancina (p.77).

This is a rarely fine first edition of a work which is certain to become a standard manual.

C.L. Remington

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.

Speyeria diana, S. cybele leto and letona, and S. nokomis nitocris, ♂♂ and ♀♀ with full data, offered in exchange for needed species of Erebia and Oeneis, esp. the following numbers from McDunnough 1938 list: 127b-e; 130a-c; 135a; 136a; 138b,c; 140; 143a; 144b-c; 147; 147a; 149b-d; 151; 152. Also need any of forms recently described by dos Passos except taygete fordi and rossii gabrieli. If you have some of these species but are not interested in the Speyeria, send list of desiderata. Paul R. Ehrlich, 538 Academy St., Maplewood, N.J.

Lepidoptera of the arid Southwest. Will be collecting in southern New Mexico and southwestern Texas during June, July, and August. Careful attention to lists of desiderata.
L.H. Bridwell, Box 44, Forestburg, Texas.

AMAZON. Collector in northern Brazil accepts orders for prepared Amazonic Lepidoptera and other insects. Walter A. Riffler, Postbox 500, Belém, Estado do Parà, BRASIL.

Butterflies from Arctic and Far North especially Oeneis, Erebia, Boloria, at reasonable prices. R.J. Fitch, 2235 Pandora St., Vancouver, B.C., CANADA.

Lepidoptera of the Southwest for sale, papered or pinned. Inquiry invited. Lots of 100, either Rhop., Macros, or Micros, priced very low, all with full data. Guaranteed first class material. Frank P. Sala, 1764 Colorado Blvd., Los Angeles 41, Calif.

Wanted to buy: Seitz' "Macrolepidoptera of the World" esp. Vols.1,2,6,9,13, English Translation. G.F. Schirmer, 2912 N. 45th St., Milwaukee 10, Wis.

Bio Metal standard redwood insect box, new style, 9 x 13 x 2 ½ inches. Screw on hinge. Satisfaction guaranteed. $2.25 each, $25.00 per dozen. Also Cornell Drawers and unit pinning trays. Equipment constructed to order in our shop. Bio Metal Associates, Box 346, Beverly Hills, Calif.

Butterflies from Ecuador and Argentina. If you are interested as an amateur or a specialist in material collected by William Clark-Macintyre in Ecuador or Juan Foerster in Argentina and Paraguay, write for information and price-lists from F.M. Brown, Fountain Valley School, Colorado Springs, Colorado.

Complete set of Bull. Lep. Soc. Japan, vol.1, nos.1, 2,3, and 4 (108 pp.) (1946) - for sale, 70 cents. including postage. Hiroshi Inoue, 290 Miyamae, Okamachi, Minami-ku, Yokohoma, JAPAN.

For exchange or sale: the very rare Strymon "auretorum" (Bdv.). Also Speyeria. William T. Meyer, 4450 Kingswell Ave., Los Angeles 27, Calif.

Western U.S.A. Lepidoptera offered in exchange for tropical spp., esp. from India, and for Speyeria diana and Anaea spp. Mrs. Emily Henriksen, Route #1, Sunnyside, Washington.

I am considering a collecting trip to the Hudson Bay region of Canada next summer but it will be necessary to sell part of my catch to defray expenses. Write me if you would be interested in purchasing Lepidoptera, Odonata, or Coleoptera from this area. C.S. Quelch, Transcona, Manitoba, CANADA.

For sale or exchange: approximately 300 Manitoba moths especially Arctiidae and Noctuidae. All are pinned. What offers? Charles D. Bird, 1930 Rosser Ave., Brandon, Manitoba, CANADA.

Wanted: Rhopalocera from Africa, Asia, and Oceania in exchange for Rhop. and larger moths from Spanish and European faunas. Very particularly desire all Papilionidae, Delias, Euploea, Cethosia, Charaxes, Kallima, Euphaedra, Euxanthe, and Appias. All correspondence welcomed and answered.
A. Varea de Luque, 13 Ibiza, Madrid, SPAIN.

Speyeria diana ♂♂ caught this season for sale or exchange for tropical Lepidoptera or Coleoptera. Also have a limited number of Mitoura damon. Theodore Bock, 70 Ehrman Ave., Cincinnati 20, Ohio.

Far Eastern Rhopalocera (Japan, Formosa, Korea,etc.) Wish to exchange with all parts of the world. Have interest in Papilionidae (esp. Parnassius, Archon, Hypermnestra, Zerynthia, etc.), Pieridae, Nymphalidae, and Lycaenidae, etc. Inquiry invited. Yoshihiko Hata, No.594, Aburanocouji Buccouji,Kyoto,JAPAN.

LIVING MATERIAL

Cocoons of Graellsia isabelae ("Spanish luna") and Actias selene (Indian Moon moth), for sale.
O.H. Schroeter, P.O. Box 291, Quaker Hill, Conn.

Join the "Pupa of the Month Club": a pair of living pupae, either Rhop. or Macros each month. Also a list of other available species of the time. Two pair a month for $7.50 per year, postpaid. Four pair a month for $10.00 per year. F.P. Sala, 1764 Colorado Blvd., Los Angeles 41, Calif.

Hyalophora cecropia, H. promethea and Antheraea polyphemus cocoons for exchange for living, mounted, or papered Lepidoptera, esp. Papilionidae and Sphingidae. Will sell H. cecropia only. J.W. Morris, 2704 W. Genesee St., Syracuse 9, N.Y.

For sale or exchange: Eupackardia (Callosamia) calleta cocoons. Robert J. Ford, 3266 Ardmore Ave., South Gate, Calif.

Desire to correspond about rearing with view to exchange of ova next season, esp. Sphingidae and Saturniidae. Mrs. Hazel Chase, 272 N. Union St., Galion, Ohio.

NOMENCLATURE

A. Francis Hemming, Secretary of the International Commission for Zoological Nomenclature, has asked that we bring before the members of the Lepidopterists' Society the question of suppressing the trivial name ajax Linnaeus, 1758 (as published in the binominal combination Papilio ajax). The Commission has been requested by the late A. Steven Corbet to use its plenary powers to suppress the name ajax on the grounds that strict application of the name would cause serious confusion. Corbet found that the name was actually applied by Linnaeus to the common and wide-spread Palearctic and Oriental swallowtail now known as Papilio xuthus Linnaeus. North American lepidopterists will recall that ajax was long used for the Zebra Swallowtail (P. marcellus Cram.) and relatively recently became regarded as the correct name for the common eastern carrot-parsley swallowtail, P. polyxenes asterius (see e.g. McDunnough's 1938 Check List). Lepidopterists interested in nomenclature in all parts of the world are urged to study the relevant literature (see esp. Bull. Zool. Nomen., vol.2: pp.26-30; 1951) and submit their views as soon as possible to Secretary Hemming at the following address:

28 Park Village East
Regent's Park
London, N.W. 1, England

THE O'BYRNE COLLECTION

The life-long collection of butterflies and moths assembled by the late behaviorist Harold I. O'Byrne is being offered for sale by Mrs. O'Byrne. It includes over 4,000 mounted specimens with complete data. Nearly all families are represented, with emphasis primarily on Missouri Rhopalocera, Catocala, and Sphingidae. Some noteworthy aberrations and rarities are included. There are 45 glass-topped cases ranging in size from 12" x 16" to 14" x 22", 16 wooden boxes 9" x 13", and 64 cardboard boxes 9" x 12". The entire collection, including cases, must be sold as a unit. Potential purchasers should write: Mrs. H.I. O'Byrne, Iberia, Missouri.

RESEARCH REQUESTS

Dr. J.W. Tilden, 125 Cedar Lane, San Jose 27, Calif., is engaged in systematic studies of the hesperiid genus Ochlodes and of Strymon californica and S. adenostomatis and is seeking specimens on loan or exchange from all parts of the range of these species, for studies in geographic variation.

Anyone having specimens, records, or published references of butterflies collected in the State of Mississippi is requested to communicate with: Mr. Bryant Mather, P.O. Drawer 2131, Jackson, Miss.

Distribution records for the butterflies of Oklahoma are being assembled by: Dr. W.J. Reinthal, Central State Hospital, Norman, Okla. He requests that all lepidopterists who have specimens from Oklahoma send him information, especially as follows, for each species: number of each sex seen or taken, date, locality and county, collector, biological notes (life history, foodplants, etc.).

TABLE OF CONTENTS

ADDITIONS TO THE LIST OF MEMBERS

Ghika, George, 3900 Hamilton St., F 101, Hyattsville, Maryland. Industrial Melanism.
Harris, Edward, c/o Fitzpatrick's Hotel, Kuranda, North Queensland, AUSTRALIA. LEPID: esp. Hepialidae biology.
Langston, Robert L., 4622 3rd St., La Mesa, Calif. LEPID. Parasites of Zygaenidae. Coll. Ex.
Monteiro, Teodoro (Rev. Pe.), Mosteiro de Singeverga, Negrolos (Minho), PORTUGAL.
Šmelhaus, Jiří, Bělského 4, Praha 7, CZECHOSLOVAKIA.
Speyer, W. (Direktor Dr.), Heikendorf über Kiel 24B, Teichtor 22, GERMANY.
Upton, Murray, North Tamborine, S. Queensland, AUSTRALIA. LEPID: esp. migration.

CHANGES OF ADDRESS

Araujo, R.L. (Dr.), Instituto Biológico, Caixa Postal 7.119, São Paulo Sp., BRASIL.
Kolyer, J.M., 38 Hill Lane, Roslyn Heights, N.Y.
Orfila, R.N.(Dr.), Casilla Correo 2.-Suc.28, Buenos Aires, ARGENTINA.
Rupert, L.R., Sardinia, N.Y.
Schroeter, O.H., P.O. Box 391, Quaker Hill, Conn.

DECEASED

Glasgow, Clyde (Wyoming).
O'Byrne, Harold I. (Missouri).
Sweadner, Walter (Dr.) (Pennsylvania).

THE LEPIDOPTERISTS' NEWS
Official Periodical of The Lepidopterists' Society
One volume of nine numbers published per year

Membership is open to all persons interested in any aspect of the study of butterflies and moths. The 1951 dues, including subscription to the News, are $2.00 for Regular Membership and $5.00 for Sustaining Membership. All remittances should be sent to the Treasurer: Dr. J.B. Ziegler, 18 Baltusrol Place, Summit, N.J., U.S.A. All non-editorial correspondence should be addressed to the Society Secretary: Dr. F.H. Rindge, American Museum of Natural History, New York 24, N.Y., U.S.A.