

REVIEWS

COLORADO BUTTERFLIES. PART III. LIBYTHEIDÆ, RIODINIDÆ AND LYCÆNIDÆ. By F. Martin Brown, assisted by Donald Eff and Bernard Rotger. *Proc. Denver Mus. Nat. Hist.*, No. 5: pp. 113-176, 148 figs. 29 Oct. 1955 [Price \$0.50; available from Curator of Publications, Denver Museum of Natural History, City Park, Denver, Colorado, U.S.A.]

The first part of the projected five that will make up this work was reviewed earlier by REMINGTON (*Lepid. News* 9: 21, 1955), and his general commentary need not be repeated here. The present part enumerates the species of the three families given in the title above, but since there are included only one libytheid and two known (plus two "possible") riodinids, this leaves the remaining 56 pages devoted to the lycænids. The treatment of these throughout is informative and authoritative. Descriptions are kept brief and usually comparative; habitat information is given — a rare luxury in North American butterfly literature apart from KLOTS' classic *Field Guide*; a brief description of the general species range is added; and finally the authors give a county by county list of all known localities (save for the most ubiquitous species, for which only counties are recorded). Locality records are remarkably and pleasingly numerous and betray the extensive activity of BROWN and the new small army of Colorado collectors.

Life history information is slender and, apart from some observations on possible or probable foodplants, most appears to have been garnered from the literature — and this has not been combed thoroughly. In fact the most serious criticism of the work can be directed at the apparent incompleteness of the authors' knowledge of pertinent literature. Even this, however, is not overly detrimental for the oversights are spotty rather than systemic and involve usually only minor points.

The taxonomic treatment is generally excellent and up to date. The discussion of higher groups — families and subfamilies — is poor and mostly borrowed from the literature. It reflects ill, not on the authors (for this is not the place to get involved in research on higher classification), but on the current status of our knowledge of the higher classification of butterflies. At lower levels, questions on which I take issue with the authors below are nearly all of a nature so complex and geographically so extensive in scope as to exceed by far the obligations of a regional list to unravel. Here again, they serve to emphasize the large amount of taxonomic work still needed on our North American butterflies, especially those of the West.

Below are a few comments on particular species, arranged in order of their appearance in the book.

Atides halesus (p. 124). Presumably Colorado specimens belong to the western subspecies *estesii* Clench, but this is not stated.

Strymon melinus (p. 126). The subspecies of *melinus* are very poorly understood. Plains material is probably *franki* as stated. It is however, doubtful that *atrofasciata* occurs anywhere near the state. It is a heavily marked race apparently confined to Vancouver and the adjacent humid areas of British Columbia and Washington. Whether or not mountain material from Colorado can be referred to *setonia* McD. (described from the interior of southern British Columbia) I do not know. It is conceivable but doubtful.

Strymon acadica (p. 129) — not "*acadia*".

Strymon californica (p. 130) and *sylvinus* (p. 131). These are far more similar than the authors indicate, in the Rockies at least, and are there far more readily separated by habits (oak association for *californica*; willow for *sylvinus*) than anything else. The male genitalia of the two are effectively identical. The subspecies of *sylvinus* is incorrectly spelled "*putmani*" (should be *putnami*). Regarding *dryope*, I suspect that the erroneous type locality given by EDWARDS, "Plain County, Colorado", was the result of misreading a hastily penned label intended to be "Placer Co., Cala." The "c" would

be taken for an undotted "i" and the "er" for an "n." Nor would it have been the only time that the once prevalent (written) abbreviation "Cala." had been mistaken for "Colo."

Strymon liparops (p. 132). The statement that eastern *liparops* feeds on oak is only partly true. KLORS (*Field Guide*) lists a number of other very different host species, and the Forest Insect Survey of Canada has reared *liparops* in Ontario on hickory, ash, and cherry. This does not materially reduce the significance of the suspicion that western *aliparops* feeds on hawthorne in contrast to eastern *liparops*, which apparently does not. The authors may well be right in suspecting that *aliparops* (to which should be added *fletcheri* Mich. & dos P.) may be a species distinct from eastern *liparops*. In facies at least, the western populations form a group very different from the eastern.

Strymon edwardsi (not listed). From remarks under *falacer* and elsewhere I wonder if this species has not been inadvertently omitted. The only record I know of for the state is the vague and possibly dubious "So. Colo." listed by MICHENER and DOS PASSOS in 1942. The species, however, could very well occur in Colorado, and definite records would be interesting.

Mitoura spinetorum (p. 137). So far as I know there is no evidence that this species occurs in more than one subspecies, despite its wide range, which extends from southern British Columbia south to Jalisco, Mexico.

Mitoura siva (p. 138). The Moffat Co. specimen cited without further data is one of a long series taken by MR. J. BAUER in June 1942 at the base of Douglas Mt., 6,500 ft. It is very doubtful that *M. xami* occurs in Colorado. It is essentially a Mexican species, rarely taken north of the border (southern Texas, southern Arizona).

Incisalia augustinus (p. 139). The few specimens I have seen from Colorado (and Utah) suggest that what occurs in this region is best described as a hybrid population, a mixture of western *iroides* stock and eastern *augustinus* stock. Specimens can be found that agree with either of these and others are clearly intermediate. The same is true, apparently, over much of central Canada. Possibly along the eastern part of the Front Range true *augustinus* occurs, though I have seen no material.

Incisalia schryverii (p. 141). Colorado specimens are usually a little smaller and darker than *mossii* from Vancouver but do not seem to differ much otherwise. They certainly do not warrant being placed as a separate species. As a matter of fact it appears that both *mossii* Hy. Edw. and *schryverii* Cross are nothing but subspecies of *fotis* Stkr. along with *doudoroffi* dos P. and *windi* Clench. The ranges of none of these forms overlap, and putative transition areas (e.g., southwestern Colorado) have either not been collected in or the material from there has not been critically studied. *Incisalia fotis schryverii* has nothing whatever to do with the eastern *henrici*: the latter has the strongly recurved costa, elongated scent pad locus (despite absence of the pad itself) and produced tails of the *irus-henrici* group which stands well apart from the *augustinus* group, to which *schryverii* belongs. The nearest thing to an intermediate between these groups is *polios*.

Incisalia eryphon (p. 142). The authors' report of eggs of this species being laid on *Pinus ponderosa* is the first definite published host plant of that species, though pines have long been suspected. The Canadian National Collection, it may be added, has specimens from Alberta and British Columbia bred to maturity on the Lodgepole Pine (*P. contorta latifolia*).

Genus *Callophrys* (p. 144). Some years ago I revised the North American species of this genus (*Bull. Mus. Comp. Zool.* 94: 217-229, 1944) in a paper which seems to have become very little known to students. A few statements made therein deserve repetition here, to which a few other notes are added. *Callophrys sheridanii* (p. 145) is known from as far west as Brewster, Washington (and possibly extends south to California in the Coast Range or the Sierras) and as far north (Can. Nat. Coll.) as Alberta and British Columbia. The nominate race *Callophrys apama* (p. 146) appears to be confined to Arizona. Eastward, in New Mexico and southern Colorado, specimens

occur with the "apama line" only partly developed, clearly intermediate to the almost immaculate *homoperplexa* B. & B. which reaches its most typical area through Colorado. Farther to the north, in the northwestern part of the state and southwestern Wyoming, it is possible that intermediates to *affinis* will be found, though this has so far been considered a distinct species.

Lycæna dorcas (p. 156). The authors consider *dorcas* and *helooides* to belong to a single species and refer Colorado material to "*dorcas florus*." The correctness of this view is a large and complex question which would consume far too much space to enter upon in detail here. My own opinion is that the two are good species and the following can be cited in support of it: first, *dorcas* is a *Potentilla* feeder, single brooded, and usually a bog species (but see below), while *helooides* feeds on *Polygonum* (and possibly others — but not *Potentilla*), is multiple brooded, and prefers open fields. Secondly, the two are sympatric and readily distinguishable on facies over a broad area from roughly southern Michigan to southern Manitoba. Third, there is no "perfect intergradation" across the continent as the authors state, though if large series are not seen it might appear so. The really difficult matter concerns the populations that are found in the Rockies from Colorado northward to Alberta and British Columbia. These lie in the area that should be inhabited by *helooides* and, at lower altitudes, actually is; but specimens from higher elevations, apparently the true *florus* of EDWARDS, seem to be little more than large *dorcas*. It would be most valuable in any future unravelling of this difficult problem if collectors, especially in the Rockies, would attempt to do the following things: (1) keep captures of different colonies — no matter how small — separate and indicated as such; (2) make a careful description of the habitat of the colony — grassy, wooded, wet, dry, boggy, or whatever, and in some detail; (3) ascertain the foodplant being used, which is not particularly difficult if females are watched carefully (also, the leaves of *Potentilla* and *Polygonum* plants can be checked for eggs or larvæ); (4) learn by revisiting if there is more than one brood; (5) collect good series — ten or twenty of each sex. Incidentally, a fair amount is known about the life history of *dorcas*, contrary to the authors' statement: NEWCOMB (*Can. Ent.* 43: 160-168, 1911) described its life history from Michigan material; it is also published that *dorcas dospassosi* McD. is a *Potentilla* feeder near a costal salt marsh; and that *dorcas claytoni* Brower feeds on a large bushy *Potentilla* growing on dry upland fields.

Lycæna mariposa (p. 158). There is a specimen in the Carnegie Museum collection from White River Nat. Forest, 8970 ft., 28 vi (Mrs. P. WIBLE) apparently the first authentic record for the state.

Echinargus isola (p. 160). The range as given is much too conservative. *E. isola* occurs southward at least as far as Costa Rica and ranges northward to Minnesota (cf. Macy & Sheppard, 1941, *Butterflies*: 170) and eastward well across the Mississippi to Ohio and Michigan (cf. Remington, 1942, *Bull. Brooklyn Ent. Soc.* 37: 6-8, for its eastern distribution). The bulk of the northern range of the species may be made up of migrants from the south or their immediate offspring, it being unlikely that the species can overwinter in the north (cf. Nabokov, 1952, *Lepid. News* 7: 52).

Icaricia icarioides (p. 164). NEWCOMER (1911, *Can. Ent.* 43: 85-88) has rather carefully described the life history of this species, probably the typical (Sierra Nevada) subspecies, under the name of *Lycæna fulla* Edw.

Icaricia shasta (p. 166). The species ranges farther north than the authors give, since BOWMAN (1917, *Check List Macrolep. Alberta*: 6) records it from Calgary and Dorothy in that province.

Brephidium exilis (p. 169). This is apparently another species which cannot overwinter in the north. Captures have been made at least as far north as Durkee, Oregon.

Everes amyntula (p. 175). The authors follow tradition in maintaining the specific distinctness of *amyntula* and *comyntas*. I suspect, however, that future studies will considerably alter the picture. For one thing, I know of no overlap in the ranges of the two supposed species and at least one area over which intermediates (apparently secondary intergradation) occur. For another, the boreal "white" form which passes for

amyntula bears little resemblance to the figure of BOISDUVAL's type given years ago by OBERTHÜR, which apparently represents the large, dark, lowland California population.

The range of the boreal "*amyntula*" is much more extensive than given, reaching northward to Alaska and the Mackenzie Delta region and eastward to the Gaspé Peninsula.

Celastrina argiolus (p. 176). Several recent authors, whom BROWN and his co-authors have apparently followed, have referred North American *pseudargiolus* to the Palearctic *argiolus* as a subspecies. In the absence of careful and extensive genitalic studies (which have not, to my knowledge, been published or even made), this seems unwarranted. North American representatives of the genus were undoubtedly derived from Asia via Alaska and the Bering Straits route, in the more or less remote past (possibly as late as mid-Pleistocene but not later). In Asia there are several very closely allied species among which *argiolus* is no more likely a candidate for "nearest relative" than others. These were reviewed by FORSTER (*Mitt. Münch. Ent. Ges.* 31: 593-627, 9 text figs., pls. 19-22, 1941), whose paper I have drawn on for much of the information given here. Further, the easternmost Palearctic representatives of *argiolus* form a group of subspecies (the *ladonides* group, in Japan, China, and the Himalaya) almost specifically distinct from the European and other western *argiolus* races (*argiolus* group), though annectant subspecies are known. In view of the uncertainty that exists regarding which of the Asiatic species of *Celastrina* is nearest to *pseudargiolus*, as well as the confused and poorly understood taxonomy of *pseudargiolus* itself (e.g., the distinct possibility, still uninvestigated, that more than one species occurs in North America), it is much wiser to keep the North American forms as a species distinct from *argiolus*. Some years ago (*Journ. N. Y. Ent. Soc.* 52: 273, 1944) I described the Colorado subspecies of *pseudargiolus* as new (ssp. *sidara*), so there is an available name for them, of which the authors seem unaware. This step of mine was premature and ill-advised, in view of both the very insufficient material at my disposal then and a failure to consider the whole *pseudargiolus* complex together. Though I believe the name to be valid, "if I had it to do over again" I should have left it for a more thorough survey of the species as a whole.

This review cannot better be concluded than by stating that the purposes of its authors are more than fulfilled. The work will have a wide appeal — to amateur and professional, tyro and seasoned collector, dilettante and enthusiast; there is something of value for each. The impression is strong that one could visit Colorado for the first time and, accompanied by the *Colorado Butterflies*, efficiently look for and (barring the whims of Nature) find almost any species mentioned, able as well to give it its correct name.

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THE BUTTERFLIES OF THE MALAY PENINSULA. By A. Steven Corbet and H. M. Pendlebury (2nd Edition, revised by A. Steven Corbet, edited by N. D. Riley). 568 pp., 55 plates (8 color, 26 half-tone, 21 line), 159 text figures. Publisher: Oliver & Boyd, 39a Welbeck St., London, W. 1, England [Price, bound, £5. 5. 0 net (\$14.70)].

It seems hardly fair, either to the late authors or to the book itself, to label this as merely a revised edition of the first *Butterflies of the Malay Peninsula*. In every respect it is a new book, so different and so much improved that, useful though the earlier effort was, the present one far outstrips it and has every right to stand on its own. It is a final, fitting monument to its two capable and energetic authors, neither of whom survived to see it published.

The book is divided into three parts: part I of about 86 pages in ten chapters discusses generalities; part II is the dominant portion of the work, the discussion of