

Article X.—NOTES ON AMERICAN LEPIDOPTERA WITH DESCRIPTIONS OF NEW VARIETIES

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Variation is a subject fruitful of discussion and, as all the butterflies described in the following pages are variations of recognized species, it seems best to make our position clear and define our terms, so that readers, who have not seen the works quoted below,¹ may have a clear understanding of just what we mean and what we consider these butterflies to be biologically and how we place them taxonomically. We follow the principles and nomenclature used by Rothschild and Jordan in their comprehensive revisions of the Sphingidæ and American Papilios.

We consider a "species" to be a group of individuals of the same general kind which are fertile *inter se* but which are or tend to be infertile with individuals of any other group. Every individual of a species possesses certain characters common to every other individual of the same sex of that species, except where there is "alternation of generations" or something of the sort, and these characters or their combination is not possessed by any other species. There may be little or great variation of characters within a species and the geographic range of a species may be large or small; or, as Rothschild and Jordan put it (Nov. Zool., XIII, p. 430, footnote) "The principal criterion of the conception 'species' is that species can exist together without fusing, no other barrier keeping them apart than their own organization."

We sometimes find one or several individuals which differ in one or more characters from other individuals of the species. If such variant individuals are rare, we consider them to be "aberrations" and, if they are quite distinct, we think it is well to call attention to them and to give them a name which may enable workers to refer to them without repeating a description. It is presumed but, without breeding experiments, cannot be positively asserted that the variant characters of an aberration are transmitted to its descendants although, if recessive in a Mendelian sense, they may not become evident again for many genera-

¹Rothschild, Walter and Jordan, Karl. 1903. A Revision of the Lepidopterous Family Sphingidæ. Nov. Zool., IX, Suppl.

Rothschild, Walter and Jordan, Karl. 1906. A Revision of the American Papilios. Nov. Zool., XIII.

Turner, Hy. J. 1913. The Terminology of Variation. Ent. Rec., XXV, pp. 230-233, 303, 304.
McAttee, W. L. 1920. Specific, Subspecific and Varietal Categories of Insects and the Naming of them. Ent. News, XXXI, pp. 46-55, 61-65.

tions, if at all. On the other hand, there may be such an increase in the number of individuals showing the aberrational characters that they are common in one or more localities. We consider that the aberration has then developed into a color phase or "form."

According to this conception, there is no fundamental difference between a form and an aberration. It is merely a question of the number of individuals showing the characters in question. What is now an aberration may become a form in a few years and what is merely an aberration in one locality may be abundant enough in another locality to be considered a form. In the latter case we would call it a form wherever found. We use the two terms merely to express the state of affairs at the present time as far as we know them.

A "subspecies" is a taxonomic division intermediate in rank between form and species and, as we use the term, two subspecies never occur in the same locality. They are incipient species. A subspecies might be considered to be a variety which has become so thoroughly established as to have replaced its ancestral form. If a species has broken up into subspecies or forms, or into both subspecies and forms, the species is the aggregate of all its varieties.

We consider "race," "geographical race" or "geographical variety" as synonymous with subspecies. When the term "form" is used in a definite, technical sense, we apply it to color forms or phases as before mentioned. As we are not dealing, in this paper, with either dimorphs or seasonal forms, we refer the student to the 'Monograph of the Sphingidæ,' p. xlv, for the proper formulæ. We do not use the word "variety" in any strict or definite sense but only as a general term to cover any or all of the various components of a species. The reasons for not using "variety" for a definite form are amply discussed in both of the revisions referred to above.

The taxonomic arrangement employed is to use a binomial for the species, if no subspecies be known. If subspecies are known a trinomial is used. These may be followed by the names for the form or aberration preceded by the abbreviations f. or ab. The name of an insect thus becomes a formula which shows at a glance its phylogenetic relationship, as understood by the author. We have employed the above defined system in arranging the following species and where our information warrants it in connection with previously described insects, we have changed the author's original designation.

***Basilarchia floridensis* ab. *halli*, new aberration**

This aberration differs from the typical *floridensis* of Strecker in having the extradiscal band on the secondaries above obsolete. All other markings above and below are as in the typical form. It is the same type of aberration as *B. archippus* ab. *lanthanis* Cook and Watson and if there be anything in the mimicry theory, it is a better mimic of *Danaus berenice* Cramer than is typical *floridensis* (Strecker).

Holotype male.—Florida; in The American Museum of Natural History. This specimen is in very fair condition except for a nick at the apex of the left secondary. Mr. G. C. Hall donated this specimen, which was purchased from a dealer, to the Museum and we take pleasure in dedicating it to him.

***Strymon acadica souhegan* (Whitney)**

W. H. Edwards described *acadica* in 1862 from a specimen taken by W. Saunders at London, Ontario. C. P. Whitney described *souhegan* in 1868 from specimens taken by him at Milford, New Hampshire, on the banks of the Souhegan River. W. H. Edwards lists *souhegan* as a variety of *acadica* (Synopsis of North American Butterflies, 1872, p. 29). Since that date *souhegan* has appeared in the synonymy in our various catalogues and there has been no recognition of its true significance.

A recent series of *acadica* received from Gravenhurst, Muskoka District, Ontario, collected by H. S. Parrish, were of such different appearance from the specimens of local capture in the hills of New Jersey that an investigation was prompted. These Muskoka specimens were captured July 19 to 27, 1918 and are in fresh and perfect condition. They agree very closely with W. H. Edward's original description of *acadica* and also with his figures (The Butterflies of North America, 1868, I, Pl. 1. *Thecla*). They were captured approximately 150 miles from London, Ontario. These specimens are characterized on the wings above by the dark ground-color, a slate-brown, the generally brownish fringes of the wings and the orange-red color of the spot between the tails. Beneath, the wings are a pearly brown with the maculation of usual form except that the orange-red markings are heavy and have a tendency to extend up on to the primaries more or less prominently.

A series of bred specimens from Hewitt, New Jersey, corresponds with the original description of *souhegan*. They are characterized above by the pale brown ground-color of the primaries, the generally whitish fringes of the wings and the orange color of the spot between the tails.

Beneath, the wings are a pearl gray color with the orange markings generally not so pronounced or of so reddish a color as true *acadica* and not so much extended on the primaries. The extradiscal rows of spots beneath are generally farther removed from the margin than in *acadica* and the row on the primary is generally bent in toward the base as it nears the costa to a greater extent than in *acadica*.

A comparison of the male genitalia of specimens from Gravenhurst, Hewitt, and Chilson Lake, Adirondack Mountains, Essex County, New York, shows minor differences. The Chilson Lake specimens are intermediate in wing appearance between typical *acadica* and *souhegan*. From the evidence presented it would seem that a resurrection of the name *souhegan* was warranted.

True *acadica* is represented only from the Muskoka locality in the collections before us.

The distribution of the *souhegan* race is shown by specimens from Hewitt, New Jersey; Ulster County and Van Cortlandt Park, New York.

Intergrades appear from Greene County and Chilson Lake, Adirondack Mountains, Essex County, New York.

***Strymon acadica acadica* ab. *muskoka*, new aberration**

This aberration differs from typical *acadica* on the upper side, in that the spot between the tails of the secondaries is pale orange instead of orange-red. Beneath, it varies from normal specimens in that the ordinarily orange-red markings are yellow. The character of separation is very distinct and is not due to fading, as the specimen is fresh and perfect and was received in a series of typical *acadica*. In the type specimen there is a general reduction in the size of all markings beneath but all are present; however, this may be considered as a note on the individual specimen only and not as a characterization of the aberration.

Holotype male.—Gravenhurst, Muskoka District, Ontario, Canada, July 27, 1918, (H. S. Parrish); in The American Museum of Natural History.

***Strymon acadica souhegan* ab. *swetti*, new aberration**

This aberration differs from typical *souhegan* (Whitney) on the under side only, the upper side being normal. The under side is similar to the typical form in the presence and location of all the usual markings. The difference lies in the ground-color, which is grayish white instead of the typical pearly gray. The black spots do not appear to be encircled with white as in normal specimens: This effect is produced by the lack

of contrast between the whitish ground-color and the white scaling around the spots. A slight trace of the normal ground-color is retained in the extreme outer margin of all wings between the submarginal lunules and the outer border; but this should be considered as an individual rather than a character difference.

Holotype male.—Stony Clove, Greene County, New York, altitude 1500 to 2000 feet, July 10, 1911, (F. E. Watson); in the collection of Wm. P. Comstock. We take pleasure in naming this aberration for Mr. L. W. Swett.

***Strymon acadica coolinensis*, new subspecies**

This differs from true *acadica* in its larger size and paler coloration. Above, the wings both in the male and female are of the same color as *souhegan*; beneath, the ground-color is slightly darker than *souhegan* but lighter than typical *acadica*. The orange markings are a dull orange and not orange-red as in *acadica*. They come closer in color to *souhegan* but are not so bright. Compared to *souhegan*, which superficially it resembles more closely than *acadica*, it will be noted that the extradiscal rows of spots beneath are slightly closer to the margin of the wings as is the case in true *acadica*. The wing expanse is from 36 to 40 mm.,¹ averaging larger than any other race of *acadica* with which we are familiar. An examination of the male genitalia showed slight differences.

Holotype male and allotype.—Coolin, Idaho; in the collection of Wm. P. Comstock.

Paratype male,—Idaho; from the collection of Wm. P. Comstock and deposited in The American Museum of Natural History.

***Strymon acadica montanensis*, new subspecies**

This is indistinguishable from *souhegan* on the upper surface but averages slightly larger, being from 36 to 38 mm. in expanse. Beneath, the ground-color is a pale but warm brown, several shades lighter than *acadica* and darker and different from the pearly gray color of *souhegan*. Moreover the extra discal row of spots on the primaries is arranged in a straighter line than in any of the other forms and does not curve in as much toward the base below the costal margin as in any of the other races. The male genitalia also shows differences.

Holotype male, allotype, and paratype male No. 3.—Montana; in The American Museum of Natural History.

Paratype males Nos. 1 and 2.—Montana; in the collection of Wm. P. Comstock.

¹All measurements are taken from center of thorax to apices.

***Strymon sœpium chlorophora*, new subspecies**

The male is dark red-brown with purplish reflections upon the upper side, *sœpium* (Boisduval) being of a slightly paler shade and not showing the purplish tinge. The purplish appearance is not dissimilar to that of the males of *Tharsalea virginiensis* (Edwards). Otherwise the upper side is as in *sœpium*. Beneath, the wings are of a dark purplish brown much darker than *sœpium* and presenting a strikingly different appearance. The extra discal line of both wings is present but all white markings, so noticeable a character in *sœpium*, are obsolete in some to absent in many individuals. The submarginal markings are not much fainter than in *sœpium* except at anal angle of secondaries, where they are much more reduced in prominence and only traces of white scales in and about the fringes remain. The blue anal patch is also reduced. There is a tendency more or less developed in individuals to a darker ground shading of brown within the extra discal lines. This is not at all characteristic of *sœpium*. The female is similar to the male except in that it is less distinguishable from *sœpium* female above.

Holotype male and allotype.—San Diego, California, June 14, 1913, (W. S. Wright); in the collection of Wm. P. Comstock.

Paratypes.—Sixteen males and seven females from the collections of Wm. P. Comstock and The American Museum of Natural History, where paratypes Nos. 1 and 2 are deposited.

***Strymon sœpium provo*, new subspecies**

The male is of a little paler brown above than *sœpium* but otherwise similar. Beneath, it is paler, being gray-brown varying in shade in different individuals. The underside markings are all present but reduced and in most specimens there is a slight development of the white scales which border the extradiscal spots in *sœpium* so prominently. There is no difference in the ground-color within and without the extradiscal rows of spots except to a slight extent in occasional individuals. The female is similar to the male.

Holotype male and allotype.—Provo, Utah, July 9, 1909, (T. Spalding); in the collection of Wm. P. Comstock.

Paratypes.—Eleven males and eleven females. Nos. 1, 2, 5, 6, 7, 8, 9, 10, from the collection of Wm. P. Comstock, are deposited in The American Museum of Natural History.

In comment on *Strymon sœpium*, the typical insect seems to be rare in collections. Boisduval very correctly characterized it ("Dessous brun,—traversé un peu au-delà du milieu par une petite ligne blanche")

and Oberthur has splendidly figured it (*Études de Lépidoptérologie Comparée*, 1913, IX, part 1, p. 40, Pl. ccxxxv, fig. 1922).

The form *fulvescens* (Henry Edwards) is also uncommon in collections. The types in the American Museum collection show it to be pale with the under side markings obsolete. The distribution of these two forms is not known beyond the type localities, but typical *chlorophora* is found also in Truckee, California and Medford, Oregon, and *provo* comes from Verdi, Nevada as well as the type locality. *Strymon chalcis* (Behr) seems to be well worthy of its name as it is distinct and, for the present at least, it does not seem advisable to drop it from specific rank. Dr. Behr's description is not enlightening but the specimens from the Henry Edwards material before us probably correctly represent the species. It has the contrasting shades of ground-color, dark within and light without the extradiscal rows of spots beneath, a character noted in *chlorophora*, but is otherwise quite different. The color beneath is warm brown, a different shade entirely from the *sæpium* races, and the markings are differently and more regularly placed. An examination of the male genital armatures of the various forms showed slight differences.

***Incisalia polios* ab. *davisi*, new aberration**

This aberration differs from normal *polios* Cook and Watson in having the hoary gray shading which covers the outer half of the under side of the secondaries confined to the area between the veins in the form of elongate elliptical radiations. The series of chestnut-brown dots occurring in the usual form are here produced as a series of larger lunate spots one occurring in each radiation. The margins of the wings have a series of triangular spots of the dark brown ground-color, which color extends up the veins separating the gray radiations.

Holotype male.—Manchester (now called Lakehurst), New Jersey, April 29, (W. T. Davis); in The American Museum of Natural History from the collection of F. E. Watson and named for our good friend, Mr. William T. Davis.

***Heodes xanthoides luctuosa*, new subspecies**

This differs from the typical form of *xanthoides* (Boisduval) in being generally paler in ground-color on both wing surfaces, the males and females being equally characteristic in this particular. The orange marginal markings of *xanthoides* are replaced in the new form above and below by pale lemon markings and their areas are not so extensive and beneath in the anal area of the secondaries obsolete. Beneath, the ground-

color is strikingly different from the warm buff appearance of *xanthoides*, in the new form being a light whitish gray. Expanse about the normal of *xanthoides*.

Holotype male, allotype and paratype male.—Tehachapi, California, July 2, 1918 (John Comstock); in the collection of Wm. P. Comstock. The paratype is deposited in The American Museum of Natural History.

***Heodes hypophlæas hypophlæas* ab. *fulliolus* (Hulst)**

A single male in fresh condition now in the collection of G. C. Hall was captured on Staten Island, N. Y., May 20, 1919, by O. Fulda. This aberration has not previously appeared in any of our local lists.

The form *fasciata* (Strecker) and aberration *obliterata* Scudder also do not appear in any of our local lists but we have specimens in our collections which were captured within the limits of New York City as well as in its vicinity.

Our reason for changing the status of *fasciata*, from aberration to form, is its frequency of occurrence in certain localities. It was described by Strecker, as an aberration, from a single female taken in Florida but in light of the present known distribution we feel that it should be elevated in rank. This form is of frequent occurrence at Sharon and Woods Hole, Massachusetts, Fox Hills, Staten Island, New York, and in certain localities on Long Island, New York. In a considerable series from these localities many specimens show the tendency to prolongation and irregularity of the spots.

***Heodes hypophlæas hypophlæas* ab. *banksi*, new aberration**

This aberration differs from typical *hypophlæas* (Boisduval) in the markings of the primaries on the upper side. The extradiscal row of six black spots merges with the border of the wings. This is apparently produced by the widening of the wing border but comparative measurement made with typical specimens of *hypophlæas* shows that this is not the case. The merging is caused by an actual shifting of the extradiscal row of black spots, except the subapical ones, toward the slightly broader outer border and by the prolongation of the spots on their outer sides into the border where their bright black is contrasted with the rusty black color of the border. The paratype male is slightly different in appearance from the holotype male in that the extradiscal black spots are smaller and depend almost entirely upon the shifting of their position to cause them to merge with the border. Also, in the paratype the copper color is of a paler tint. The two spots in the discal cell in both specimens are normal in size and position.

On the under side of the primaries, the shifting of the spots toward the border holds equally, but because of the pale gray color of the border, the shifting is not so apparent but is definitely revealed by comparative measurement with normal specimens. Taking the third spot from the hind margin as an instance for comparison, it was found that this spot in both specimens of the aberration now described is nearer the outer margin by a space equal to the width of the spot itself.

The secondaries are normal above and below and the size of the specimens is normal, the expanse is 29 mm. in the type and 28 mm. in the paratype.

A most interesting point in connection with this aberration is the relation to the form *fasciata* (Strecker) in which the extradiscal row of spots is prolonged toward the base of the wing. In *ab. banksi* the spots are prolonged and moved in the opposite direction or toward the margin. Thus this aberration is produced by an action directly opposite to that which takes place in *fasciata*.

Holotype male.—Lexington, Massachusetts, July 17, 1897, (C. Bullard); in the Museum of Comparative Zoology, Cambridge, Massachusetts.

Paratype male.—Lexington, Massachusetts, July 18, 1897, (C. Bullard); from the collection of the Museum of Comparative Zoology, deposited in The American Museum of Natural History.

We take pleasure in naming this interesting aberration for Mr. Nathan Banks.

***Philotes enoptes mojave*, new subspecies**

The male of this race is paler in appearance than *enoptes* (Boisduval); while *enoptes* is of a blue comparable to *comyntas* (Godart), this new form is of the same blue as *pseudargiolus* (Boisduval and LeConte). Its smaller size (expanse 21 mm.) is also noticeable at once, as it is only about three-fourths the expanse of *enoptes*. On the upper side, the dark markings are a dark gray rather than blackish and consist of an edging on the outer margin, barely a millimeter in width, which is continuous on the primaries and interrupted by the veins to form a series of border spots on the secondaries. Fringes are blackish at base and white at extremity and alternately black and white on primary, as in *enoptes*. Beneath, the males are similar in every respect to *enoptes* except in size, the markings being reduced in proportion. The male genitalia have been carefully studied and compared with other species and subspecies of the genus *Philotes* and show that this race is most closely

allied to *enoptes*. The valves are of the same outline as *enoptes* but differ in that the characteristic saw-tooth outer edge is reduced to a single terminal spike followed by two small prongs. This would indicate a relationship to *rita* Barnes and McDunnough, which is, however, offset by the shape of the penis, which has the narrow-lobed base of *enoptes* and not the broad-lobed base of *rita*.

The female is similar in appearance to *enoptes* female on the upper side and beneath it is similar in aspect to its own male, though more heavily marked. The allotype is a poor specimen but the presence of blue scales at the base of the wings above is noticeable to a greater degree than in the females of any of the other species of *Philotes* before us. Expanse 22 mm.

Holotype male and allotype.—Mojave Desert, California, April 18, 1913; both in the collection of Wm. P. Comstock.

Paratype male.—Mojave Desert, California, April 18, 1914; from the collection of Wm. P. Comstock and deposited in The American Museum of Natural History.

These three specimens were obtained through a dealer and no further information than that given above was available.

For working out the identity of the species in the genus *Philotes*, reference should be made to the valuable papers by Barnes and McDunnough in the various numbers of their 'Contributions to the Natural History of the Lepidoptera of North America' and to the paper by R. C. Williams, Jr., in the Entomological News, 1918, XXIX, p. 99.

***Philotes sonorensis* ab. *sonoralba*, new aberration**

The male of this form varies from typical *sonorensis* (Felder) in having the two red spots on the primaries above replaced by two cream-white spots which are larger and more prominent than is usual for the normal red spots to be. Beneath, there is no trace of red whatsoever, the area where it normally occurs being cream-white a shade deeper than that of the spots upon the upper surface. In normal specimens it will be noted that the red spots beneath are surrounded by a cream-white area. In other respects the aberration does not vary from typical specimens.

Holotype male.—San Diego, California, February 26, 1909, (L. E. Ricksecker); in the collection of Wm. P. Comstock.

Plebeius acmon ab. **labecula**, new aberration

The male and female of this aberration differ from typical *acmon* (Doubleday and Hewitson) in that the extradiscal rows of spots on the under side of the wings are obsolete to absent.

Individual characters of the male specimen not cited as diagnostic are its small expanse (18 mm.), the reduced area of the pinkish orange markings of the secondaries above, and the pronounced development of the cell-spot on the secondaries beneath. The female expands 30 mm. and is normally colored and marked in every respect except for the absence of the extradiscal rows of spots beneath.

It is of interest to know that Henry Edwards, in whose collection these specimens were, recognized their peculiarities and labeled them as varieties of *acmon* not, however, giving them a name.

Holotype male.—San Francisco district, California, (Henry Edwards). Allotype.—Nevada, (W. T. Eaves). Both in the collection of The American Museum of Natural History.

