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A NEW SPECIES AND SOME NEW SUBSPECIES OF *SPEYERIA* (LEPIDOPTERA, NYMPHALIDAE)

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The new names proposed in this paper will be included in our systematic catalogue of the Nearctic genus *Speyeria* Scudder (1872, p. 23) which is to be published later. That paper will list all of the species and subspecies in revisional sequence. We have also in preparation a series of monographic papers discussing the subspeciation of the various Nearctic entities. Therefore, remarks under the present descriptions are limited to brief notes establishing classificational positions.

Speyeria wenona, new species

Figures 1, 2

Above, the males are paler in ground color than *nokomis nokomis* (W. H. Edwards) (1862b, p. 221) with finer black pattern. All of the usual spots, lines, and dashes are similar to the pattern found in *nokomis* but are reduced in size and intensity. The outer marginal interspaces between the nervules are especially light in contrast with *nokomis*, and the white fringes show more distinctly. The females are very different from that sex of *nokomis*, lacking the solid brownish black basal suffusion and the contrast thereby gained with the straw-colored band of the outer third of the wings. In *wenona* the ground is nearly concolorous throughout in both sexes with only the limited basal suffusion common to the genus. In the apical area of the primaries of the female the underside silver areas appear above as whitish spots. In *nokomis* these spots are concolorous with the band.

Below, the males are similar to *nokomis* except that the discal area of the secondaries is overlaid basally with light olivaceous green. This greenish overcast is occasionally suggested in *nokomis* but sel-

dom emphasized, the males of the latter insect having but little contrast between the disk and the band except in the montanic subspecies *nokomis nitocris* (W. H. Edwards) (1874, p. 15) where the disk becomes brown. The females of *wenona* are also green in the discal area, rather like females of *nokomis*. The smaller size, reduced pattern, and paler ground in both sexes and the comparative lack of color contrast in the females give instant separation from all *nokomis* variations hitherto named.

EXPANSE: Holotype 59 mm., allotype 62 mm. (*nokomis* 65 to 78 mm.).

TYPE MATERIAL: The holotype male and allotype female were taken, *in copula*, in a subalpine meadow, 12,000 feet, Cerro Potosi, Municipio de Galeana, Nuevo Leon, Mexico, July 18, 1938, by R. A. Schneider. They are in the American Museum of Natural History.

REMARKS: This species belongs nearest to *nokomis nokomis* by male and female genitalia; by the simple female bursa it is apart from the *Semnopsyche* group (dos Passos and Grey, 1945, p. 13); and by the male armature, especially the ventrally excavate uncus outline and large digitus, it is distinct from the species group headed by *callippe* (Boisduval) (1852, p. 302). In a superficial aspect, *wenona* is suggestive of *nokomis* but in view of our present ignorance of Mexican distributions, it is described as a distinct species. It is quite unlike anything previously named.

Speyeria cybele letona, new subspecies

Figures 3, 4

Argynnis leto, COMSTOCK, 1927, p. 81, pl. 23, fig. 6, female.

Argynnis leto ab. *letis*, COMSTOCK, 1927, p. 82, pl. 23, fig. 8, male.

Above, both sexes are similar to the subspecies *cybele leto* (Behr) (1862, p. 173). The males average smaller, with lighter ground. They are well suffused and heavily marked in discal areas but very noticeably clearer and less spotted in the submarginal band. The in-pointing, black, submarginal lunules of the secondaries, which are conspicuous in *leto*, are much reduced and indicated by light dashes rather than by heavy crescentic markings, and there is likewise considerably less black scaling accenting the nervule endings. This subduing of pattern makes the outer third of the wings appear lighter than in *leto*. The females are not so boldly marked, the black is not quite so intense, the size averaging a trifle smaller and the submarginal markings reduced and less crescentic, giving emphasis to the wide light band. In these minor respects they are slightly different from *leto* yet closely similar. It is in the males that the variation from *leto* is greatest.

Below, in the males, the enclosed submarginal lunules are little silvered or not silvered at all, while in *leto* these spots are usually well silvered. The disk of the secondaries is duller brown, the usual spots are well silvered approximately as in *leto*, but the submarginal areas again differ because of reduction in pattern intensity. The females vary similarly; the lunular submarginal row of spots is silvered but reduced to mere dashes.

EXPANSE: 60 to 65 mm., holotype 63 mm.

TYPE MATERIAL: The holotype male and allotype female are from City Creek Canyon, Salt Lake City, Utah, 4500 feet, July 17, 1939 (W. L. Phillips, L. P. Grey collection). There are 41 paratypes as follows: 24 males and 12 females, same locality and collector, July 5–August 24, 1939–1943 (L. P. Grey collection); 4 males, Mill Creek, American Fork Canyon, Utah County, Utah, August 6, 1932 (*ex* J. D. Gunder collection); 1 male, Ogden, Utah, July 25, 1920 (*ex* J. D. Gunder collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: This is a Great Basin subspecies, relating to *leto*. The type locality of *leto* is near Carson City, Nevada. In a dispersal through the northwest to and down the Rocky Mountains there is relatively little variation. In northern Colorado, however, significant changes begin. The transition through the southern Rocky Mountain areas shows adequate linkage of *leto* to *cybele* (Fabricius) (1775, p. 516) in unnamed colonies from *charlottii* (Barnes) (1897, p. 39) to *carpenterii* (W. H. Edwards) (1876, p. 204), while in the mountainous portions of the Great Basin *letona* is prevalent westward, distinct from the darker, more heavily patterned specimens typical of the more northern distribution.

W. L. Phillips (*in litt.*) offers the following notes upon the type locality: "Males are common in most of the lower elevations of the canyons of the Wasatch Range on the east of Salt Lake Valley, from early June until September. Some fly until frost. The females are quite plentiful for about ten to fifteen days in late June or early July but only in sections of City Creek, Mill Creek, Lambs and some of the other canyons; after that time they seem to spread out over more territory, are harder to find and in poor condition."

J. A. Comstock's figure (1927, pl. 23, fig. 8) of *letis* (Wright) (1905, p. 130, pl. 12, fig. 111, male) is an excellent color photograph of *letona*. This Provo, Utah, specimen is not *letis*, a name which was originally applied to a light aberration of *leto* from the Coast Range of northern California.

Speyeria coronis simaetha,

new subspecies

Figures 5, 6

Above, both sexes are similar to *coronis snyderi* (Skinner) (1897, p. 154) but much smaller and with corresponding pattern reduction. The 65 to 75 mm. topotypical *snyderi* from Salt Lake City, Utah, is greatly varied in ground color from ruddy to quite pallid brown, while *simaetha* is more consistently intermediate.

Below, both sexes vary like *snyderi* but are probably less extreme in color changes.

In the latter subspecies the disk may be any shade from deep brown to olivaceous green. In *simaetha* the disk is sordid light olivaceous brown varying to a greener tint. Females of these subspecies tend to be greenish below, the males more brown, but in some individual specimens this does not hold true. The band in *simaetha* is narrowed and darker with less clarity both of definition and of color. The differences between the sexes are the usual argynnid characters of accented pattern and more rounded primaries in the females.

EXPANSE: 53 to 60 mm., holotype 54 mm.

TYPE MATERIAL: The holotype male is from Black Canyon, Cascade Mountains, near Brewster, Washington, June 25, 1939, and the allotype female is from the same locality, July 20, 1940 (J. C. Hopfinger, L. P. Grey collection). There are 7 paratypes as follows: 2 pairs, same locality and collector, June 10–July 20 (L. P. Grey collection); 3 males, same locality and collector (C. F. dos Passos collection). The holotype and allotype are in the American Museum of Natural History. The paratypes are in the collections of the authors.

REMARKS: A study of extensive material has convinced us that the fluctuations of *garretti* (Gunder) (1932, p. 282) relate to the species *zerene* (Boisduval) (1852, p. 303) rather than to the species *coronis* (W. H. Edwards) (1864b, p. 435). The latter view has long been held by many American students, including ourselves (1942, p. 4). On the basis of this revised estimate of fundamentally important relationships, *snyderi* is now considered to be the Great Basin subspecies of *coronis*, with *halcyone* (W. H. Edwards) (1869a, p. [81]) intergrading but becoming a distinct subspecies of *coronis* in the Rocky Mountains. A detailed account of the linkages from *coronis snyderi* to *coronis coronis* is postponed to a later paper. The newly described subspecies, *simaetha*, is endemic in the Cascade Ranges. In common with companion species of *Speyeria* and butterflies of other genera, a relative stability is achieved in those mountains. However, excessive variation occurs in the colonies that are

found from Oregon to the California mountains, also in the Great Basin mountains to the Rocky Mountains, the other major path of Canadian and Transition Zone dispersal and subspeciation.

Speyeria zerene myrtleae, new subspecies

Figures 7, 8

Above, both sexes resemble *zerene behrensi* (W. H. Edwards) (1869b, p. 370) both in size and in appearance except for a lighter ground color against which the markings show more conspicuously and the enclosed or partly enclosed mesial and submarginal areas are more contrastingly defined. The basal suffusion is more noticeable against the lighter ground.

Below, both sexes are paler than *behrensi*, and are light tan and light, delicate reddish brown rather than the bold, heavy ruddy brown of *behrensi*. The pattern is the same although less distinctive because of the lighter color. The usual spots are well silvered throughout but not so prominent due to the less contrasting background.

EXPANSE: 54 to 56 mm., holotype 56 mm.

TYPE MATERIAL: The holotype male is from San Mateo, California, July 27, 1919, and the allotype female is from the same locality, August 10, 1919. There are 5 paratypes as follows: 1 male and 4 females from the same locality, August 10–24. All were collected by W. F. Breeze and are in the American Museum of Natural History.

REMARKS: In the Shasta Gap region of northern California there is much variation pointing from the Sierran cline of *zerene* and culminating in isolated rare coastal colonies, of which we have records from most of the counties north of San Francisco Bay. It is expected that *myrtleae* from south of the bay will be a great rarity, very locally confined and sporadic in occurrence, as is usual with species representatives that are struggling on a marginal fringe of the distribution. Whenever a collector finds a colony of these coastal rarities he may count it a fortunate day, whether it be the classic *behrensi* in its Mendocino County strongholds or similar variants of even greater

interest from the other coastal counties. The stock seems to increase in rarity in proportion to the extent of its southerly penetration. San Mateo County may prove to be its utmost limit. Our records of this coastal cline are mostly from 20 to 30 miles inland.

***Speyeria zerene sinope*, new subspecies**

Figures 9, 10

Above, both sexes are similar to *zerene garretti* but are much smaller, with pattern correspondingly reduced, more intensely black, and with slightly less basal suffusion. The ground color of the males, in series, is noticeably a redder shade of brown than is usual in *garretti*.

Below, both sexes vary greatly, as is to be expected in this species. The submarginal band is usually wider, lighter, and clearer, and the silvered spots are more pronounced against a more solidly olivaceous brown disk than in *garretti*; also the half-inch difference in wing expanse is quite constant. From *zerene platina* (Skinner) (1897, p. 154) the males are readily separable by reason of darker color throughout and obviously are a montanic race. The females vary toward being lighter, some specimens approximating *platina*, but normally agreeing with the males in having the darker aspect and more sharply defined pattern brilliancy.

EXPANSE: 50 to 55 mm., holotype 53 mm.

TYPE MATERIAL: The holotype male and allotype female are from Rocky Mountain National Park, Colorado, 8000 feet, collected by Roy Weist (L. P. Grey collection) in the Estes Park area, July. There are 42 paratypes as follows: 12 males and 30 females with the same data. The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: The distinct populations occurring in the Colorado Rockies constitute one of the major trends observable in North American butterfly subspeciations. The variation in western and northern Colorado is great, but in a large area in and near the Front Range the material shows

relative stability. To the already large number of named Colorado butterfly subspecies we add *sinope*. It is typically so unlike named subspecies that a separate recognition seems desirable. The southern extent of this distribution remains to be explored. We have seen specimens from New Mexico which are like *platina*. Extensions of *sinope* to the Black Hills and to western Nebraska may be expected.

***Speyeria zerene cynna*, new subspecies**

Figures 11, 12

Above, both sexes are like *zerene platina* with somewhat lighter markings, more unicolorous ground, and more limited basal suffusion.

Below, both sexes are lighter than *platina*, many specimens having the disk of the secondaries almost concolorous with the pale straw band. There is no rosy suffusion at the base of the primaries, and in all respects this is a strikingly pallid *Speyeria*.

EXPANSE: 50 to 55 mm., holotype 52 mm.

TYPE MATERIAL: This insect is described from a type series of 25 males and 9 females, all from Ruby Valley, Elko County, Nevada, as follows: holotype male, Humboldt National Forest, 1931-1932 (E. Schiffel, ex J. D. Gunder collection), and allotype female, Wright's Ranch, July 12-24, 1931 (ex J. D. Gunder collection). There are 32 paratypes as follows: 10 males and 6 females, July 12-26 (ex J. D. Gunder collection); 3 males and 1 female, July 12-24 (C. F. dos Passos collection); 12 males, various collectors and dates, June 12-July 16 (L. P. Grey collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: This is the form that is widely distributed in collections under the name *gunderi* (Comstock) (1925, p. 67). As previously stated by us (1942, p. 4), we believe that true *gunderi* from Buck Creek, Modoc County, California, is a local population of extremely light *coronis snyderi* and thus belongs to a species complex distinct from the *zerene* subspeciations although amazingly like *cynna* in nearly all

of the superficialities. However, even in the Buck Creek locality, specimens do not average so light as Comstock's figures of the types (1927, pl. 27, figs. 4, 5, 6), and in nearby regions there is full transition to the darker Sierran *snyderi*, so called, of the east slopes. Comstock's figures are reduced, as the males before us from the type catch measure 65 mm., a half inch larger than *cynna*. The classification under *zerene* demands explanation at somewhat greater length than is convenient in this paper. Briefly, we trace through *platina* and *garretti* via *picta* (McDunnough) (1924, p. 43) to *bremnerii* (W. H. Edwards) (1872, p. 63) and thence across the Shasta Gap to the Sierran cline.

Speyeria callippe elaine, new subspecies

Figures 13, 14

Above, both sexes are similar to *callippe rupestris* (Behr) (1863, p. 84) but are larger. The dark ground, deep basal suffusion, heavy pattern, and heavily scaled veins are characteristic of these subspecies.

Below, both sexes are obscurely to brilliantly silvered. The usual range of *rupestris* is from a complete lack of silvering to a maximum of partial silvering of the submarginal lunules. The Oregon populations are usually silvered, although occasionally the wholly unsilvered or partially silvered forms may occur.

EXPANSE: 50 to 56 mm., holotype 53 mm. (*rupestris* averages 50 mm.).

TYPE MATERIAL: The holotype male and allotype female are from Butte Falls, Oregon, May 21, 1931 (*ex* J. D. Gunder collection). There are 70 paratypes from Jackson County, southern Oregon, as follows: 6 pairs, Ashland, June (T. B. Blevins, Jr., collection); 2 males, Hyatt Lake, June 29–30 (D. B. Stallings collection); 17 males and 4 females, Butte Falls, May 11–21 (L. P. Grey collection); 3 males and 6 females, Roxy Ann, near Medford, June 30–July 12 (L. P. Grey collection); 4 males, Butte Falls, May 19–23 (C. F. dos Passos collection); 2 pairs, Siskiyou Summit, June 28–29, 1939 (M. Doudoroff, C. F. dos Passos collection); 8 males and 4 females, Butte Falls, May 17–June 24 (*ex* J. D. Gunder collec-

tion); 2 females, Medford, May 30–June 6 (*ex* J. D. Gunder collection); 1 male and 1 female, Butte Mountains, July 12–13 (*ex* W. C. Wood collection); 1 female, Siskiyou Pass, June 22 (*ex* J. D. Gunder collection); 1 female, Keene Creek, June 24 (G. Malcolm, *ex* J. D. Gunder collection). All of the specimens were collected by W. F. Lawrence, unless otherwise credited. The holotype, allotype, and the 18 paratypes *ex* J. D. Gunder and *ex* W. C. Wood collections are in the American Museum of Natural History. The other paratypes are in the collections of T. B. Blevins, Jr., D. B. Stallings, as above noted, and the authors.

REMARKS: In series, *elaine* is very distinct although the change from *rupestris* is merely to a larger size, deeper color, and greater increase of silvering. Being well distributed in collections, it has given rise to much confusion because of attempts to place it under the older names. This is the insect which Gunder distributed, erroneously, as *hippolyta* (W. H. Edwards) (1879b, p. 81). The northern Coast Range subspecies of *callippe* have been well linked by captures made in recent years. In Mendocino County there is a full transition from *liliana* (Henry Edwards) (1876, p. 170) to *rupestris* in Trinity County. In northern Siskiyou County the species has become like *elaine*, and the aberrant characters of some of the southern Oregon specimens point clearly to the next stage, a transition toward a green phase near *semi-virida* (McDunnough) (1924, p. 42), which becomes complete on the dry side of the ranges.

Speyeria callippe sierra, new subspecies

Figures 15, 16

Above, both sexes are dark like *callippe inornata* (W. H. Edwards) (1872, p. 64) but are smaller. The males have the heavy veining, and both sexes have the bold, dark pattern markings characteristic of the California subspecies of *callippe*.

Below, both sexes are well silvered, variable from buff to light brown in the disk, sometimes with a definite overcast of greenish. The band is clear straw varying to light buff.

EXPANSE: 44 to 53 mm., holotype 45 mm.

TYPE MATERIAL: The holotype male is from Gold Lake, Sierra County, California, July 6, 1928 (C. Hill, *ex* J. D. Gunder collection), and the allotype female is from the same locality, June 27, 1931 (F. W. Friday, *ex* J. D. Gunder collection). There are 28 paratypes as follows: 15 males and 7 females (*ex* J. D. Gunder collection); 5 males and 1 female (L. P. Grey collection), all from Gold Lake, June 23–July 20, and all collected by F. W. Friday. The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: The correct application of the names *callippe juba* (Boisduval) (1869, p. 60) and *callippe laura* (W. H. Edwards) (1879a, p. 49) is obscure. Lectotype designations, to be given in a subsequent paper, are necessary since both of these insects apparently were described from mixed series, with no indicated holotypes. Unfortunately, no exact type localities can be determined, a matter of utmost importance, because upon both sides of the range Sierran *callippe* is exceedingly plastic, the colonies changing abruptly from valley to valley, with much individual variation and with a long gamut of change to distinct regional types within which the genetic trends of other subspecies appear in aberrant specimens. An arbitrary limitation of *juba* and *laura* would be preferable to the uncertainties with which the names are now applied. The dwarf subspecies *sierra* from the high Sierra, described above, appears to be distinct from the older names.

Collectors who wish to reach the type locality may be interested in the note attached to the Gunder plaque of specimens: "Definite directions. From Gold Lake Camp on road to left around Gold Lake itself, taking road to left at end of lake, which is three miles thus far. Thence, continue five miles up over mountain and down in valley to old Willoughby Mine. Specimens taken on hillside almost above

Mine. Road is an old one, not passable with auto. F. W. Friday, 1931."

***Speyeria callippe harmonia*,**
new subspecies

Figures 17, 18

Above, both sexes are similar to *callippe meadii* (W. H. Edwards) (1872, p. 67) with heavy black pattern. The borders are not solidly black as they tend to be in the latter subspecies, the marginal lines being fine and clear with brown ground color in the enclosed interspaces between the nervules. There is less basal suffusion than in the average *meadii*, and the ground color is of a lighter shade.

Below, both sexes also are similar to *meadii*. The band of the secondaries is narrowed and sometimes obscured by the olivaceous green ground which is lighter than in *meadii*. The spots are well silvered and often partially edged with black.

EXPANSE: 55 to 65 mm., holotype 57 mm.

TYPE MATERIAL: The holotype male is from Mount Wheeler (Snake Range near Utah border), Nevada, June 24, 1929 (*ex* J. D. Gunder collection), and the allotype female is from Mount Wheeler, White Pine County, Nevada, June 30, 1929 (F. W. Morand, *ex* J. D. Gunder collection). There are 36 paratypes as follows: 30 males and 6 females, same locality as allotype, June 8–July 5, 1929 (F. W. Morand, *ex* J. D. Gunder collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: Only after some hesitation have we added another name to those available for the Rocky Mountain–Great Basin green phases of *callippe*. Considered purely upon a population basis the large series of *harmonia* before us (55 males and one female, topotypes, in addition to the type series) displays the least variation we have observed from a given locality. In a color form sense *harmonia* is applicable to the majority of the western Great Basin specimens which we have seen from southeastern Oregon, southern Idaho, northern Nevada, and northern Utah. Topotypical *callippe*

nevadensis (W. H. Edwards) (1870, p. 14) is from a colony in which the individuals are extreme, being small in size, very pale and in no wise agreeing with the many variations which for years have been lumped under the name. The mountain distribution in Canada, Idaho, Wyoming, and Montana is so variable within single localities that further nomenclature seems unwise at the moment. In Colorado the variation also is great, but *meadii* is in many places a recognizable, if somewhat aberrant, subspecies. The prairie race *callippe calgariana* (McDunnough) (1924, p. 42) is likewise distinctive in the majority of specimens. We believe that *harmonia* has sufficient genetic stability to make the designation useful in describing Nevada and Utah material that is not well placed under the older names.

***Speyeria montivaga secreta*,**

new subspecies

Figures 19, 20

Above, both sexes agree in size and in general appearance with some variations of *atlantis hesperis* (W. H. Edwards) (1864a, p. 502) in northern Colorado, and are separable by attention to details which are significant only if adequate familiarity with the variation is presumed. The lower side silver spots are outlined on the upper surfaces in light tan, contrasting with the reddish tan ground. The feature of spots in lighter relief above is common to many species but is rarely emphasized in Colorado subspecies of *atlantis* (W. H. Edwards) (1862a, p. 54). Since the greatest possibility of confusion here is to *hesperis*, the difference will be found useful. The general color impression in comparison to *hesperis* is of less intensity. The ground color is a lighter shade and not so flushed with red orange.

Below, in both sexes, the primaries differ in that the inner two-thirds are light tan, only slightly touched by the orange red flush seen in *hesperis*. In the secondaries the disk is not the deep (sometimes almost brick-like) red usual in *hesperis*. It is closer to the reddish brown of *montivaga macdunnoughi* (Gunder) (1932, p. 280) although an intensification over the latter

subspecies. The band is narrow, often partly obscured, and the spots are well silvered in our series.

EXPANSE: 50 to 55 mm., holotype 51 mm.

TYPE MATERIAL: The holotype male and the allotype female are from Rocky Mountain National Park, Colorado, 8000 feet, July, 1942, collected by Roy Weist (L. P. Grey collection) in the Estes Park area. There are 4 paratypes as follows: 3 males and 1 female with the same data. The holotype and allotype are in the American Museum of Natural History. The paratypes are in the collections of the authors.

REMARKS: The subspeciation of *montivaga* (Behr) (1863, p. 84) has been universally misunderstood. The regional equivalents of *montivaga* are widely distributed, appallingly variable, and they go unrecognized or confounded. Our description of an Idaho subspecies (*linda*, 1942, p. 1) contains a brief note in which this species is first recognized and partly delimited. Since that date we have been accumulating further material and are now satisfied that the variation does go to *montivaga*, which, as the oldest name, will head the species. The insect described here is an important link extending the known range, confirming our postulation that the variants of *montivaga* are generally distributed throughout the western *Speyeria* territories, although we doubt an extension to New Mexico (since elsewhere but little tendency to southern adaptability is shown). The name selected conveys our appreciation of the possibility that *secreta* will be a "hidden" or little known race for many years. It is fully distinct to the expert eye but easily overlooked among specimens of *hesperis*. Students should note the gradual trend of *macdunnoughi* to redness as it comes east, particularly in the Big Horn Mountains of Wyoming where there is some transition to the Colorado subspecies. These colonies are nearly everywhere rare compared to other species of *Speyeria*. Disappointments are to be anticipated when *secreta* is looked for in Colorado among the much more plentiful *hesperis*. These remarks will be extended in a later paper. The

space given here is intended to convey our feeling that this group of variants makes up a poorly known entity.

***Speyeria hydaspe conquista*,**
new subspecies

Figures 21, 22

Above, in both sexes, the ground color is the paler shade that we associate with proximity to the Great Basin, but the deep basal suffusion and the heavy pattern convey the impression of a darker insect than *hydaspe sakuntala* (Skinner) (1911, p. 108) and one more nearly like *hydaspe rhodope* (W. H. Edwards) (1874, p. 13), both of which are a brighter, deeper red than *conquista*.

Below, both sexes are nearest to the very dark maroon specimens which usually pass as *rhodope*, but are more sordid in ground color. In the New Mexico specimens the spots are wholly unsilvered, very large, and arrestingly prominent.

EXPANSE: Holotype 56 mm., allotype 58 mm.

TYPE MATERIAL: The holotype male is from Little Tesuque Canyon, near Santa Fe, New Mexico, 8000 feet, August 8, 1932 (A. B. Klots), and the allotype female is from Therma, New Mexico, August 12, 1932 (A. B. Klots). There is one paratype, a female, same locality as holotype, July 8, 1932 (A. B. Klots, C. F. dos Passos collection). The holotype and allotype are in the American Museum of Natural History. The paratype is in the collection of the senior author.

REMARKS: As an entity, *hydaspe* (Boisduval) (1869, p. 60) holds remarkably constant. Throughout a range which nearly covers the western *Speyeria* territories the *hydaspe* subspeciation is closely around a similar type, whereas it is almost a rule in this genus that distant races will vary to nearly unrecognizable extremes. The California variants of *hydaspe* are well known and are satisfactorily classified. The majority of the Oregon specimens are difficult to place under existing names, but the fluctuation in those localities discourages further appellations. Throughout the Rocky Mountains and the Great Basin the name *sakuntala* usually has been employed

to designate material from widely separated localities and of varied color forms. In this very loose usage Skinner's name probably is as useful as would be a multiplicity of minor population and form names, since the variation in these regions indicates that consistent applications would be well-nigh impossible. We have ventured to describe the distinctive New Mexico specimens. They are far removed from the British Columbia subspecies and extend published records of the range of *hydaspe*.

***Speyeria atlantis lurana*, new subspecies**

Figures 23, 24

Above, both sexes are like *atlantis hesperis* but are consistently a brighter reddish brown, with black pattern narrowed and reduced, also with less basal suffusion. The affinity is still with *hesperis*, but the change definitely is toward *atlantis lais* (W. H. Edwards) (1883, p. 209).

Below, both sexes are typically unsilvered, with occasional silvered forms. In the disks of the secondaries the ground color varies and is often as dark as in *hesperis* but more usually much lighter. The variants seldom include the suffused and extremely ruddy types encountered in Colorado, and the submarginal band remains free from encroachment.

EXPANSE: 48 to 55 mm., holotype 51 mm. (*hesperis* 50 to 65 mm.).

TYPE MATERIAL: The type series is from the Black Hills of South Dakota. The holotype male and the allotype female are from Harney Peak, June 25, 1939 (A. C. Frederick, ex L. P. Grey collection). There are 32 paratypes as follows: 10 males and 5 females, same data as holotype; 10 males, Spearfish Canyon, near Lead, July 1, 1939 (A. C. Frederick, L. P. Grey collection); 5 males and 2 females, Custer, 1928 (C. F. dos Passos collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: The Black Hills are isolated from the main Rocky Mountain groups by intervening "Bad Lands," and minor subspecies of many butterflies are recog-

nizably characteristic of the region. In comparison to topotypical *hesperis* from the Front Range of Colorado, these Black Hills specimens are quite distinct and, as populations go in the western clines of this species, are remarkably constant. The slightly smaller size, redder and clearer ground, with reduction of pattern intensity above and below, are regionally typical. This subspecies is not the best indication of transition to *lais*, the main relationship being to *hesperis*. The transformation to *lais* is ideally shown in northern Montana but in colonies that vary so widely that subspecific names for them would seem to be pointless.

***Speyeria atlantis wasatchia*,**

new subspecies

Figures 25, 26

Above, in both sexes, the ground color is not ruddy but is a clear light buff similar to *atlantis chitone* (W. H. Edwards) (1879b, p. 82) and intermediate to the slightly darker new subspecies *tetonia*, which we describe next. The pattern is not heavy but is sharp and clear. The basal suffusion is not extensive.

Below, both sexes verge more in appearance toward *tetonia* and *atlantis irene* (Boisduval) (1869, p. 60) than toward *atlantis nikias* (Ehrmann) (1917, p. 55) and *hesperis*, as is to be seen in the dull disk with typically unsilvered rectangular spots and in the somewhat narrowed submarginal band of the secondaries.

EXPANSE: 50 to 57 mm., holotype 53 mm.

TYPE MATERIAL: The holotype male and the allotype female are from Payson Canyon, Payson, Utah, July 16, 1932 (L. D. Pfouts, *ex* J. D. Gunder collection). There are 44 paratypes as follows: 8 pairs, same locality and collector, July 15-28 (*ex* J. D. Gunder collection); 13 males and 7 females, July 3-29, same locality and collector (L. P. Grey collection); 4 pairs, same locality, July 9-20 (T. Spalding, C. F. dos Passos collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: The name *chitone* applies in a loose way to the "washed out" southern Great Basin specimens of the *atlantis* stock. These are in marked contrast to the ruddy, heavily patterned populations found along the main Rocky Mountain chain, although subspecies are hardly clean-cut anywhere. There is great variation within the Great Basin colonies, but they split rather well into two groups: the southern (*chitone*) in which the specimens are well silvered or obscurely so, resembling a paler version of the ruddy *nikias* of New Mexico; and the more northern part of the cline in which there is transition to the colonies which skirt the western slopes of the continental divide and culminate in *irene* of the Sierras. The three names herein proposed by us, i.e., *wasatchia* and the two following, represent distinct regional variations along this extended northwestern dispersal path.

***Speyeria atlantis tetonia*,** new subspecies

Figures 27, 28

Above, both sexes are like *hesperis* but are not so ruddy, being lighter in basal suffusion, band area, and submarginal lunules. The pattern tends to be finer.

Below, both sexes incline to lack of silvering in the spots but have complete intergradation to silvered forms. Typically, the subspecies is wholly unsilvered or obscurely so. The band area is restricted, often almost or quite obscured. In *hesperis* the band is nearly always prominent and wholly clear. The disk is lighter brick red than in *hesperis*. In the mountain states the *atlantis* populations are not genetically homogeneous. They are difficult to characterize and describe minutely because so many individual specimens will fail to agree with any rigid formula. The average specimen of *tetonia* is one which is varying away from the fluctuating *hesperis* of the Front Range and is beginning to resemble *irene*.

EXPANSE: 50 to 60 mm., holotype 53 mm.

TYPE MATERIAL: The type series is from the Teton Mountain region, Wyoming. The holotype male is from the Teton Mountains, July 11, 1931 (*ex* J. D. Gunder collection), and the allotype fe-

male is from the same locality, June 25, 1931 (*ex* J. D. Gunder collection). There are 38 paratypes as follows: 1 pair, same locality as holotype, June 29–July 18; 2 males and 3 females, Moose Post Office, Jackson Hole, July 9–August 3 (A. B. Klots, the American Museum of Natural History); 1 male, Jackson, 6600 feet, July 13–17, 1920 (the American Museum of Natural History); 2 males and 4 females, Moose Post Office, Jackson Hole, 6600 to 7000 feet, July 15–August 3, 1929 (A. B. Klots, C. F. dos Passos collection); 8 males, Teton Mountains, July 1–21, 1943, and 8 pairs, Jackson Hole, July 14–August 9, 1937 (L. P. Grey collection).

REMARKS: This is one of the names through which we indicate a hitherto undefined spur of *atlantis*. From Wyoming, along the upper limits of the Great Basin, west of the continental divide, the trend is away from the variation commonly referred to *hesperis* or to *atlantis beani* (Barnes and Benjamin) (1926, p. 92) and is toward the color form which becomes *irene* in the Sierras. With the addition of a Sierran cline, *atlantis* is by all means the most widespread of the entities in this genus.

***Speyeria atlantis viola*, new subspecies**

Figures 29, 30

Above, both sexes are similar to *irene* but are somewhat paler. The latter insect is reddish brown, and the new subspecies is of a lighter shade and not so ruddy.

Below, both sexes are instantly recognizable as being close to *irene*, but they are somewhat paler in the disk and vary toward some of the northern Great Basin unnamed intermediates to *tetonia*, occasionally with tinges of the ruddiness of *hesperis*. The spots are rarely well silvered and usually are not silvered at all.

EXPANSE: 48 to 53 mm., holotype 49 mm.

TYPE MATERIAL: The type series is from the Sawtooth Mountains, Idaho. The holotype male is from Trail Creek, 7400 feet, July 11, 1931, and the allotype female is from Camp Creek, August 9, 1931 (C. W. Herr, *ex* J. D. Gunder collection).

There are 23 paratypes as follows: 2 males, same data as holotype; 5 males and 1 female, Camp Creek, July 9; 2 males and 3 females, Deadwood Creek off Payette River, Boise County, 6800 feet, July 18; 2 females, Deadwood Summit, July 18; 1 male, Park Canyon, 7650 feet, July 10; 1 male, Wood River, July 17; 1 male, Summit Creek, 7800 feet, July 13; 1 male, Kane Creek, 8500 feet, July 8 (all preceding, *ex* J. D. Gunder collection); 3 males and 1 female, Custer County, July 18–21, 1933 (L. P. Grey collection). The holotype, allotype, and a series of paratypes are in the American Museum of Natural History. The other paratypes are in the collections of the authors.

REMARKS: It has been considered advisable to name certain colonies of the *atlantis* subspeciation between *hesperis* and *irene* in order to call attention to the relationship. The present colony was selected because here there can be no misunderstanding. These Idaho representatives are indubitably near relatives of *irene*. Granted this, the variation from the Teton region through Targhee, Salmon, Challis, Payette, and Sawtooth National Forests impresses us by reason of the outcropping of "forms" and interchange of genetic tendencies seen in almost any random colony. Even in the subspecies *tetonia* and occasionally as far away as the Wasatch Mountains of Utah, certain specimens tend to be close to *irene*, while in all of the colonies the *hesperis* aspect is recurrent. From extensive material our conclusion is that the polytypic species of *Speyeria* will remain incomprehensible until the species units like *atlantis* are given due recognition, which means less insistence upon the specific merits of localized color forms. The intergradation between these colonies is continuous. The subspecific names are of real usefulness only to the extent that they summarize regional trends and help toward an understanding of the larger entities.

NOTE: Since we contemplate further work in *Speyeria*, we are not distributing paratypes at present. Later, we shall deposit paratypes where they will be available to West Coast, Canadian, and Euro-

pean students in the instances where extent of material permits depletion. All short series will be turned over intact to the American Museum of Natural History.

The size and importance of the *Speyeria* collection make this institution uniquely suitable as a repository and center of study for these butterflies.

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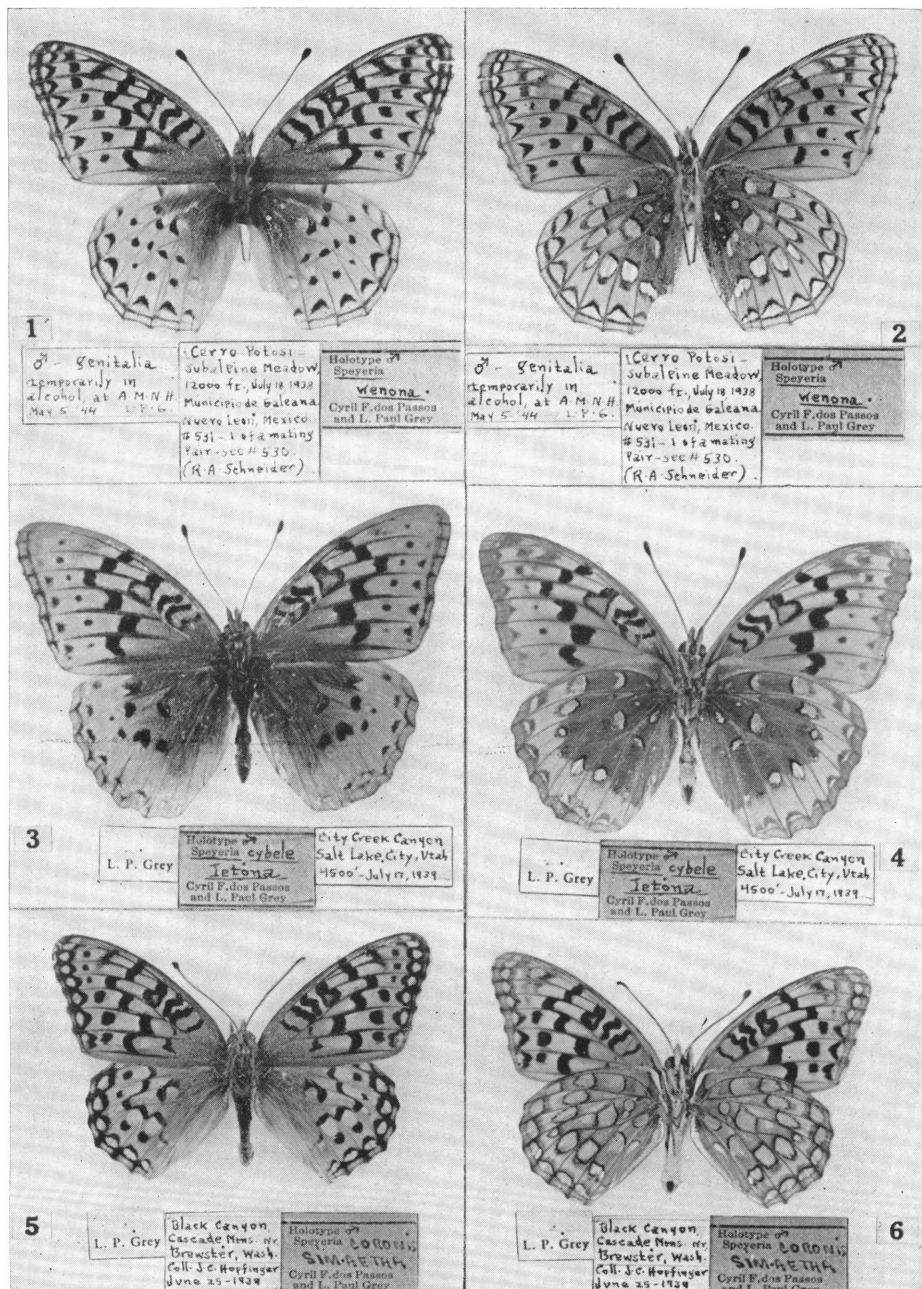
SKINNER, HENRY

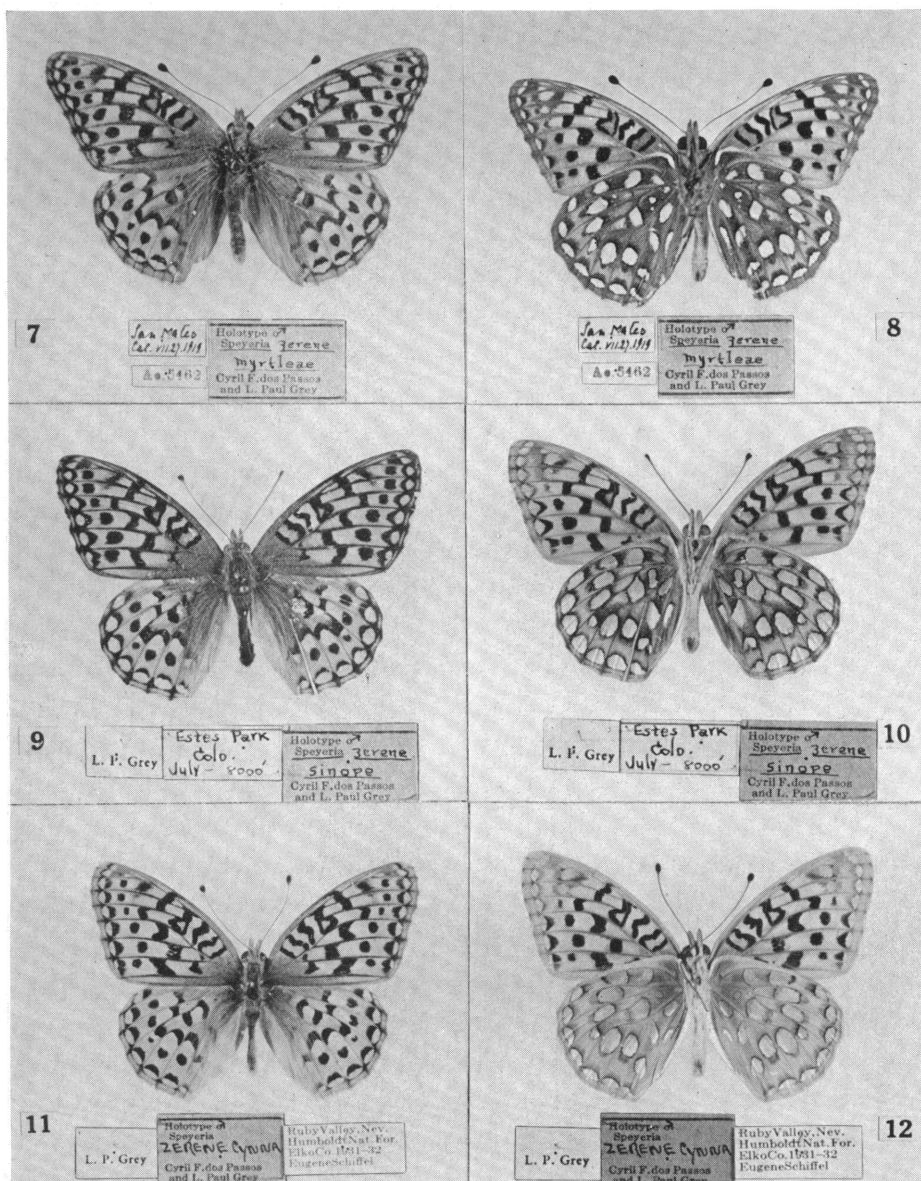
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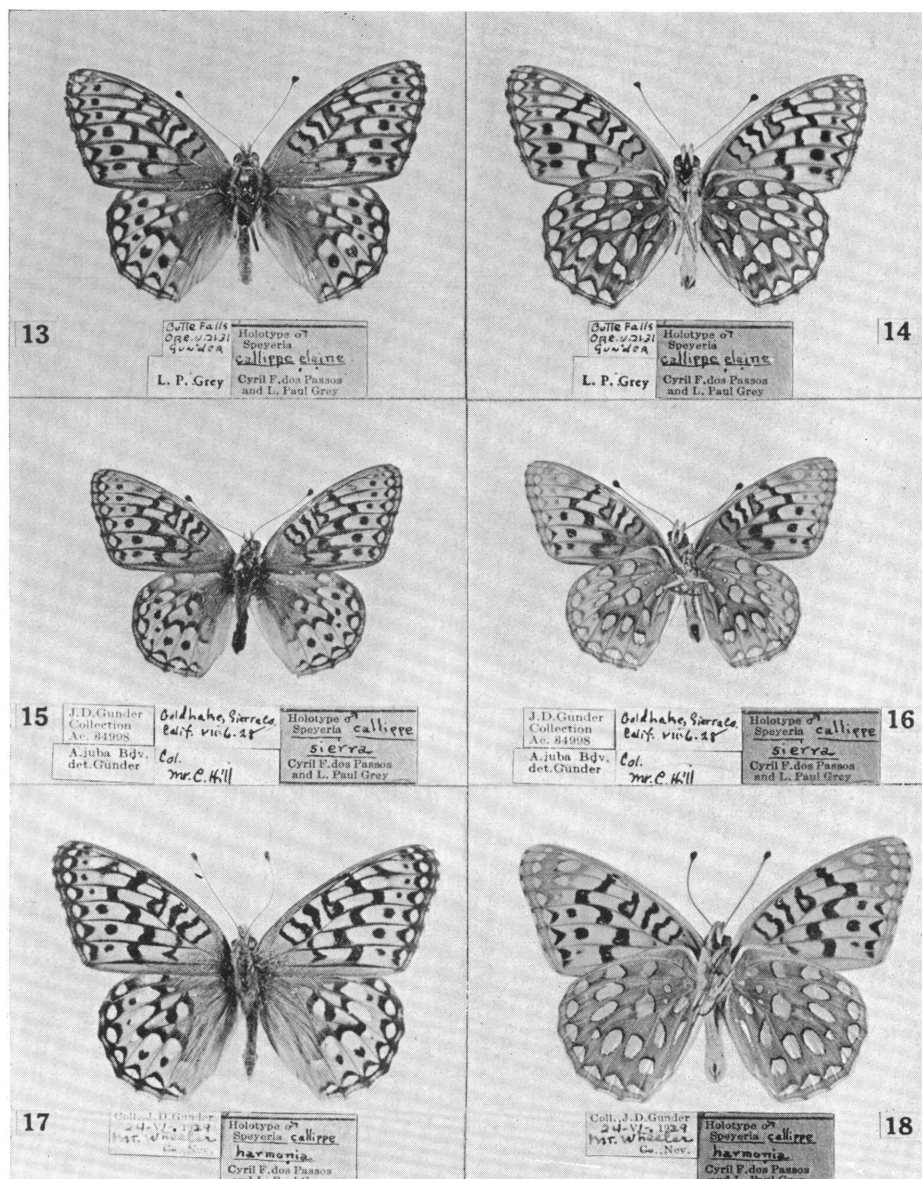
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Figs. 1-2. *Speyeria wenona* dos Passos and Grey, holotype male, upper and under surfaces.Figs. 3-4. *Speyeria cybele letona* dos Passos and Grey, holotype male, upper and under surfaces.Figs. 5-6. *Speyeria coronis simaetha* dos Passos and Grey, holotype male, upper and under surfaces.



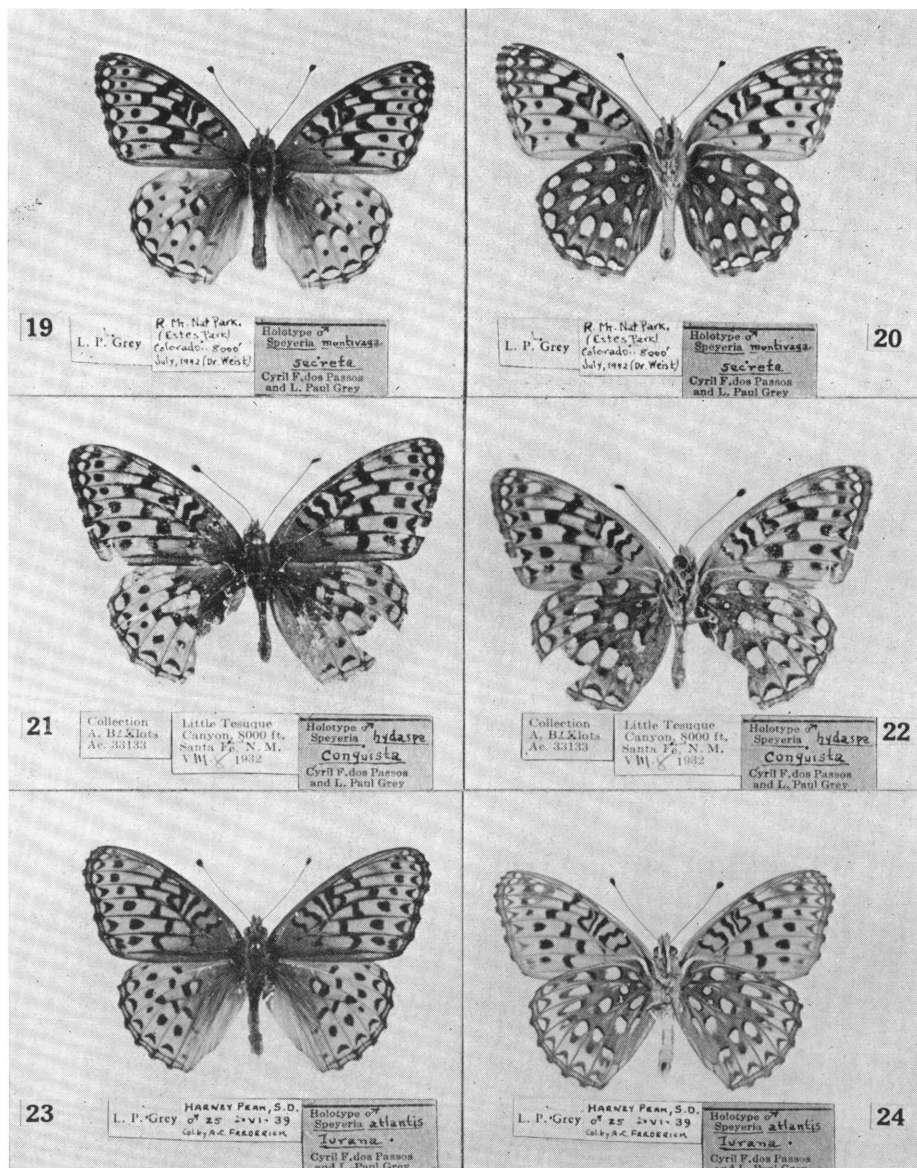
Figs. 7-8. *Speyeria zerene myrtilae* dos Passos and Grey, holotype male, upper and under surfaces.
Figs. 9-10. *Speyeria zerene sinope* dos Passos and Grey, holotype male, upper and under surfaces.
Figs. 11-12. *Speyeria zerene cyrma* dos Passos and Grey, holotype male, upper and under surfaces.



Figs. 13-14. *Speyeria callippe elaine* dos Passos and Grey, holotype male, upper and under surfaces.

Figs. 15-16. *Speyeria callippe sierra* dos Passos and Grey, holotype male, upper and under surfaces.

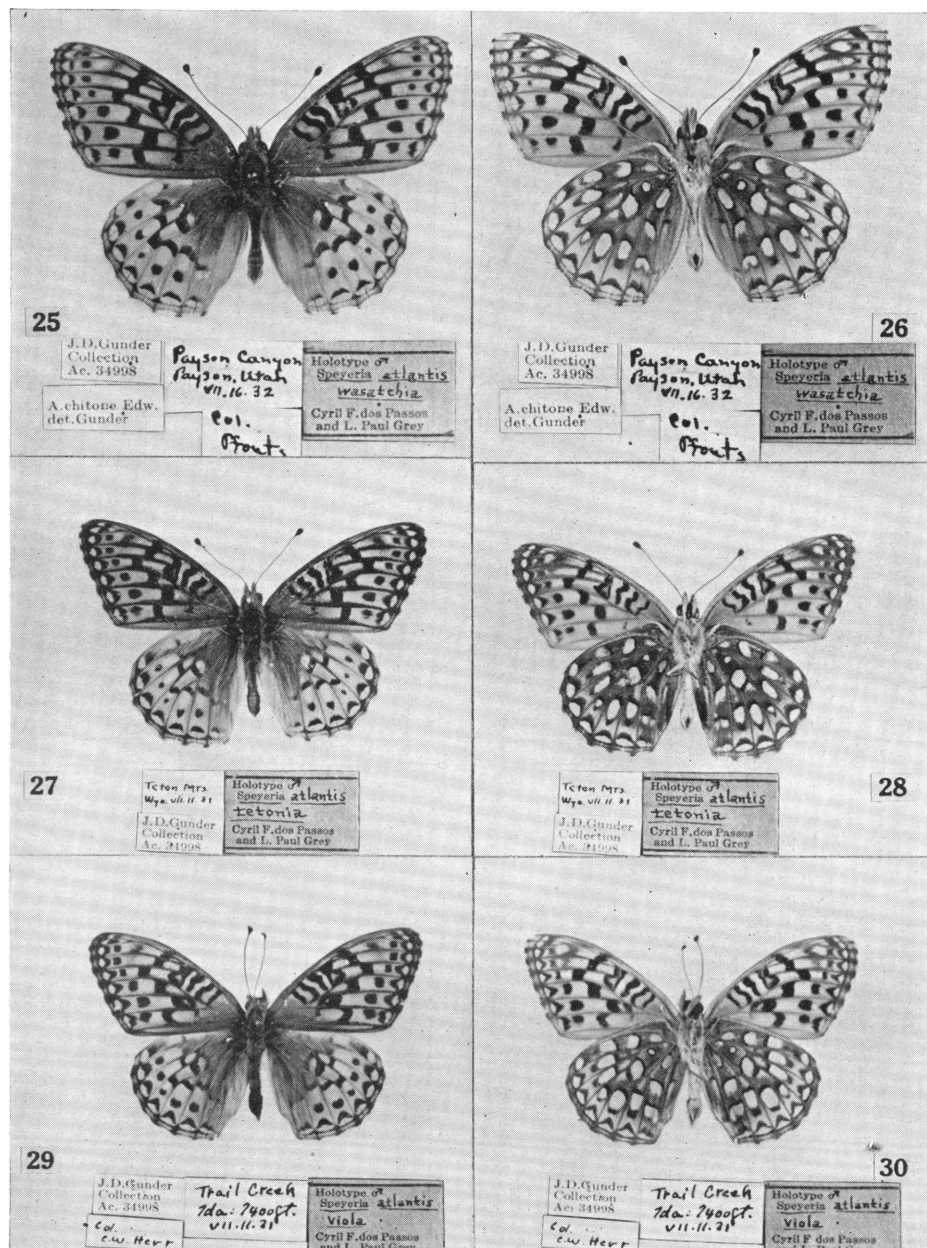
Figs. 17-18. *Speyeria callippe harmonia* dos Passos and Grey, holotype male, upper and under surfaces.



Figs. 19-20. *Speyeria montivaga secreta* dos Passos and Grey, holotype male, upper and under surfaces.

Figs. 21-22. *Speyeria hydaspe conquista* dos Passos and Grey, holotype male, upper and under surfaces.

Figs. 23-24. *Speyeria atlantis lurana* dos Passos and Grey, holotype male, upper and under surfaces.



Figs. 25-26. *Speyeria atlantis wasatchia* dos Passos and Grey, holotype male, upper and under surfaces.

Figs. 27-28. *Speyeria atlantis tetonia* dos Passos and Grey, holotype male, upper and under surfaces.

Figs. 29-30. *Speyeria atlantis viola* dos Passos and Grey, holotype male, upper and under surfaces

