

NOTES ON *SPEYERIA EGLEIS SECRETA* (NYMPHALIDÆ)

by DONALD EFF

An article entitled "A Collecting Trip in Search of *Speyeria egleis secreta*" (Remington & Eff, 1948) recounted a very pleasant collecting trip which was noteworthy because it marked the first time that *Speyeria egleis secreta* dos Passos & Grey was taken in quantity. Prior to that time, the only other articles on *S. secreta* were the original description and a discussion of the type locality (Remington, 1947).

After our success in 1948, our catch of *Speyeria secreta* and *S. atlantis* Edw. was identified by L. P. GREY of Lincoln, Maine, and then shipped intact to each of us in turn. This permitted us to make full comparisons and to note the differences readily discernible in large series; we then found that we had been guilty of overconfidence in assuming that we could recognize *secreta* in the field. In following years subsequent captures and attempts at determination proved that many of our correctly applied names were lucky guesses, for while the differences may be readily recognizable when seen in series, identification of individual specimens is quite another matter. I have collected *secreta* 4 of the 7 years which have passed since that time, but until 1955 my principal success was only in becoming increasingly confused! Part of this inability to identify correctly was due to insufficient study, and the balance of it because this is one of the closest resemblances found in *Speyeria*, and certainly the closest in any *atlantis-egleis* relationship. Also the type locality of *secreta* on Rabbit Ears Pass is a *Speyeria* collector's paradise where in a descent of the western side of the Pass, a distance of about 20 miles, it is possible to take *Speyeria edwardsii* Reakirt, *S. bydaspe sakuntula* Skinner, *S. zerene sinope* dos P. & Grey, *S. zerene* intermediates close to *garretti* Gunder and *platina* Skinner, *S. egleis secreta*, *atlantis* (ranging from near *dorothea* Moeck to near *hesperis* Edw., *electa* Edw., *nikias* Ehr. and even near Appalachian *S. atlantis atlantis!*), a western race of *S. aphrodite* Fab. (rare), *S. callippe nevadensis* Edw., *S. eurynome* Edw., *S. coronis* Behr, (near *halcyone* Edw. and *snyderi* Skinner), and *S. cybele charlottii* Barnes! Small wonder then that a collector becomes confused in this maze of variation, for with one swoop of the net it is possible to capture 3 or 4 different *Speyeria*, and hundreds of specimens in a day if willing to forego other genera.

Before entering on the observations noted this year, it may be advisable to point out the differences whereby *secreta* is separable from *atlantis*. To begin, one must remember that gradients of apparently valid species of *Speyeria* approach to common facies in certain localities, however widely they may differ when found sympatrically a few hundred miles away; by tracing the intergrades closely one can demonstrate that it is quite possible for subspecies of a single species to be predominantly brown in one area, green in another, and so on, thus showing a scope of variation unthought of until the day of the modern specialists and their accumulated series from many localities. As mentioned before, material from Rabbit Ears Pass demonstrates the near-

est approach of the two gradients *egleis* and *atlantis* yet known. The most common color phase of *secreta* is almost identical with *atlantis tetonia* dos P. & Grey of N.W. Wyoming. Fortunately, this color phase does not occur in the *atlantis* taken on Rabbit Ears Pass, (or if so, then only rarely) for if it did, then it would be impossible to separate the two species. The band suffusion is common in *secreta* and approaches totality in many specimens, as it does in *tetonia*, but *atlantis* band suffusion does not appear at this point in its range. *Speyeria secreta*, with a not-too-wide spread of variation, yields occasional brown forms much like *macdunnoughi* Gunder as found in Wyoming, and understandably so, since *macdunnoughi* also displays occasional red *secreta*-like individuals. In size, *secreta* is smaller than *atlantis*, although individual specimens overlap in this characteristic. Average size of *atlantis* in expanse of primary is 63-64 mm., while that of *secreta* is 59 mm. Probably the most distinct and useful feature is the ruddiness seen in the mesial area on the underside of the *atlantis* primary, as contrasted to the dead light tan found there in *secreta*. One other feature is that the hindwing band of *atlantis* is likely to stand forth clearer, lighter, wider, and less liable to suffusion; in *secreta* this band is often suffused, or nearly so. Above, *secreta* is a lighter neutral brown by contrast with *atlantis*, which averages to ruddy phases like those found along the Plateau south to New Mexico, darker in pattern contrast. For the first time, enough females have been taken to prove that they follow the differences discernible in the males to a large extent. Unsilvered forms occur in both, although sparingly. Once one is able to separate *secreta* from *atlantis*, another obstacle is presented by *aphrodite*, which occurs sparingly here in a color phase near *secreta* and *atlantis*, but is separable by the thin wing venation of the male primary.

With the exception of Professor NABOKOV's captures near Encampment, Wyoming, and his recognition of *secreta* at a point where the two species *atlantis* and *egleis* do not so closely approximate each other, there have been no satisfactory observations made with regard to *secreta* because of faulty identifications in the field. This year, additional precautions were taken. All *Speyeria* from one locality were given a number, notes made with regard to habitat and habits, and the specimens from each area were kept separate. Immediately upon return home all were relaxed and restudied in comfort and leisure. The results were even better than I had hoped for.

My field companion this year was RONALD LEUSCHNER. We crossed the Continental Divide at Muddy Pass, where the elevation is only 8772 feet, and continued climbing from there to Rabbit Ears Pass, crossing at an elevation of 9680 feet. Traveling westward from here you are in the subalpine zone on a gradually sloping plateau. The evergreen forest is spotty, and most of the land is quite open. There are marshy areas, usually the source of a small stream, around which grow scrub willow, western "skunk cabbage" and many other plants. The vegetation is lush, but the collecting here is poor. The Walton Creek Campground is a convenient headquarters and marks the edge of the real descent. From here, the road winds rapidly down through the montane and foothills zone to the Yampa Valley which has an altitude of 6300 feet. Although descending through only two plant zones, there are

three distinctly different ecological belts at the various elevations. Uppermost are the conifers, most of them now dead from the ravages of the bark beetle. Next below groups of aspen begin to appear among the pines, and soon the area is composed almost entirely of aspen with an undergrowth of waist-high bracken. Continuing downward, there appear among the aspen the first sentinels of the oaks, and eventually, near the bottom of the descent, the aspect changes to an area covered entirely with oak and sagebrush. All this is within a distance of approximately 20 miles!

The next day, July 13th, being a favorable one, LEUSCHNER and I started in the morning with a plan to "spot" collect. As the road winds down through the pine belt, there are wide turnouts on various curves. Near the sign marking the beginning of the "Ski Trail," and in another nearby spot, we stopped and collected in the open glades and under the trees. The openings were alive with wild flowers, especially wild geraniums. Descent of any hillside always ends in some ravine where it is wet underfoot with a tangle of growth extremely difficult to push through. Here, a little later in the year, on a tall yellow flower much like the Golden Ragwort you will find *S. zerene sinope* females. These two spots that we collected in the conifer belt are referred to hereafter as Area No. 1. Along the sides and tops of the ridges under the pines, the ground cover is huckleberry. Here and there are small open areas among the trees, as well as along the roadway where the trees have been cut back for a short distance. The bulk of our collecting here was done around the flowers in the little open areas, but *S. bydaspe* was to be found frequenting almost any spot where the sunlight could sift through the trees. I took 23 male *bydaspe sakuntula* here in two days, LEUSCHNER about the same number, and we missed many, many more, for they are not easy to capture. However, we saw enough to know that this butterfly is not as uncommon in Colorado as generally believed, but it is definitely restricted in habitat. *Speyeria sinope* was also fairly common here, *secreta*, *nevadensis*, and *eurynome* were scarce, and only one *atlantis* was taken.

Continuing down the west side for something like 7 miles, the ecology changes from pine and huckleberry ground cover, with an occasional clump of aspen, to practically solid aspen with only a scattered pine here and there, and a ground cover composed mostly of a solid mass of bracken. Other plants found in favorable spots include chokecherries, mint, and asters. The Yampa View Campground was our stopping place for collecting forays in this, Area No. 2, the aspen belt. Just north of this campground there is an old road, along which we collected for this is the area usually collected in the past, and the one where the most confusion with regard to separating *secreta* from *atlantis* had arisen, although *secreta* here is in the minority. This is the real habitat of *atlantis* on Rabbit Ears Pass. *Speyeria sinope* and *eurynome* also occur here in good numbers. In the minority are *navadensis* and *bydaspe*, the latter becoming more plentiful higher up. And, incidentally, this is the place for *S. cybele charlottii* during the last week of July.

The following day (July 14th) we again collected at Area No. 1 but did not spend nearly as much time there as we had the preceding day, then hurried on down the west side, bypassing Area No. 2, and collected in what

I shall call Area No. 3. Specifically, this is about 3 miles down the road from the Yampa View Campground, or about a half-mile below the Valleyview Lodge. From Yampa View Campground to Valleyview Lodge the aspen become thinner and thinner as the oak becomes increasingly plentiful. Below the lodge about the only tree to be found is the oak. The ground cover is of sagebrush. Most of the flowers found here are hidden under the edge of the oaks and in and under the sagebrush. This is hot, dusty, miserable collecting, for the *Speyeria* fly in and under and through the sagebrush and the oak, all of which makes it extremely difficult to net them . . . and amazingly easy to ruin a net! However, we were surprised to learn that here, apparently, was the real home of *secreta*! The other *Speyeria* to consider in this area was *nevadensis*. Only one *atlantis* was taken here. The males of *secreta* were busy searching the underbrush for females and all were in fresh condition. We were here only a short time, but I took 18 ♂♂ and 1 ♀ of *secreta*, 2 ♂♂ of *zerene sinope*, and the aforementioned *atlantis*. LEUSCHNER'S catch was approximately the same. A number of *nevadensis* were seen, and several taken and then released since all seemed to be battered from flying through the brush. Normally, *nevadensis* Edw. is uncommon in Colorado.

In conclusion then, the type locality of *Speyeria egleis secreta*, i.e. the west side of Rabbit Ears Pass, Routt County, Colorado, is divided into three distinctly different ecological zones. These zones can be distinguished easily by the predominance of one of three trees: Area No. 1, the uppermost zone, by the presence of conifers; Area No. 2 by the growth of aspen; Area No. 3 by the growth of oak. My records of captures of *Speyeria* in each zone are as follows for 1955:

Area No. 1		Area No. 2		Area No. 3	
	♂ ♀		♂ ♀		♂ ♀
<i>hydaspes</i>	23 0	<i>charlottii</i>	12 1	<i>zerene</i>	2 0
<i>zerene</i>	13 6	<i>hydaspes</i>	6 1	<i>egleis</i>	18 1
<i>egleis</i>	6 4	<i>zerene</i>	13 1	<i>atlantis</i>	1 0
<i>nevadensis</i>	2 0	<i>egleis</i>	20 6	<i>nevadensis</i>	
<i>eurynome</i>	2 2	<i>nevadensis</i>	1 0	(a number taken but released)	
<i>atlantis</i>	1 0	<i>eurynome</i>	7 1		
		<i>atlantis</i>	39 6		

Area No. 1 was collected twice, July 13 & 14; Area No. 2 was collected twice, July 13 & 23; and Area No. 3 only briefly, on July 14th. It should be pointed out that the number of *egleis* taken in Area No. 2 is not indicative of the ratio of appearance, for since they were the main objective, more effort was expended in capturing any specimens thought to be *egleis secreta* than was directed toward the others. Using the above record of captures as a yardstick, and correlating the written and mental notes made for each area, we arrive at these conclusions: That each aforementioned ecological zone is the true home of one or two species of *Speyeria*. The *hydaspes* is an inhabitant of the conifers, but does stray into the edge of the aspen belt although apparently it never crosses into the oak and sagebrush region. *Speyeria charlottii*

and *atlantis* have as their habitat Area No. 2, the home of the aspen. These two are the greatest "stay at homes." It would seem that the oak-sagebrush area (No. 3) is typical for *secreta* and *nevadensis* although *secreta* strays enough to make it fairly common in Area No. 2. The appearance of *secreta* in Area No. 2 might be because of an inclination on the part of the females to seek higher ground. This is common in some species, such as *Speyeria aphrodite ethne* Hem., to name an example; the males usually are found on the edge of the plains, in grassy and weedy fields, whereas the females are found much higher up in the foothills, frequenting flowers such as *Monarda*, on the hillsides and in the ravines, and apparently never visiting the fields which the males are so industriously searching. *Speyeria nevadensis* is a fast and powerful flier, and although not straying in very large numbers, will stray longer distances. *Speyeria zerene sinope*, although this is not indicated by the number captured in Area No. 3, is common everywhere. To the west, near Axial, Colorado, it is found as commonly in the valley bottoms as in the surrounding oak-sagebrush belt, but on Rabbit Ears Pass its main stronghold seems to be the upper two areas, as is the case with *eurynome*. Area No. 2 was collected on July 13th, and yielded 11 ♂♂ and 1 ♀ of *atlantis* and 16 ♂♂ and 1 ♀ of *secreta*, and by way of comparison when I collected on July 23rd I took 28 ♂♂ and 5 ♀♀ of *atlantis* and 4 ♂♂ and 5 ♀♀ of *secreta*. Considering that all *atlantis* taken the first time were extremely fresh specimens, and then examining the ratio of *secreta* males and females taken the second time, it becomes apparent that the peak of the flight period for *secreta* is earlier than that of *atlantis*, although there is considerable overlapping. This is a fact of considerable interest in view of the need for further definitions whereby to judge the separateness of these two amazingly similar gradients. The above summary of observations is not intended as a scientific discourse, but has been written at the request of L. P. GREY because these were the first communications he has received giving the ecological correlations of *secreta* and information as to the females, which heretofore have been great rarities. It is the first time that on-the-spot field identifications were correctly made, without which no ecological observation could be presumed trustworthy. Perhaps this will help to guide further field studies permitting the uncovering of other *secreta* secrets.

#### References

- Remington, P. S., Jr., 1947. Notes on the type locality of *Speyeria egleis secreta* dos Passos and Grey. *Ent. News* 58: 99-100.  
Remington, P. S., Jr., & J. D. Eff, 1948. A collecting trip in search of *Speyeria egleis secreta*. *Lepid. News* 2: 91-92.